The non-biological evolution of grammar: wh-question formation in Germanic

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The wh-marking of questions in child English is as early as the appearance of the wh-questions themselves. The wh-marking of questions in child Dutch (and the other Germanic languages) is delayed until the acquisition of articles and free anaphoric pronouns. An acquisition procedure is proposed that succeeds to set first a typological difference, V2 for Dutch and $SV_{fin}O$ for English. The different setting of the typological parameters determines the wh-development in subsequent acquisition steps. The learnability approach relativizes Chomsky's poverty of the stimulus, but affirms his position that language is "perfect" in the sense of being learnable as a cultural construct, without the assumption of innate grammar-specific a priories.

Keywords: @acquisition of wh-questions, Dutch/English, typology, cultural evolution, recursivity

1. The acquisition of wh-questions

1.1. Outline of the paper

I will first draw the attention to an acquisition problem that has been noticed before. Wh-elements in Germanic V2 languages do not appear in child language questions before the acquisition of the V2 rule and the subsequent acquisition of articles and free anaphors. By contrast, the wh-elements in $SV_{fin}O$ English appear as early as the constituent questions themselves. Both types of languages ($SV_{fin}O$ English and V2 Dutch) use clause-initial wh-elements in the same way. There is no difference in the wh-parameter. The acquisition difference must be due to the different typological background. The presentation of that problem constitutes the first part of this paper. The second part will sketch an acquisition procedure that derives the phenomenon from the basic typological difference.

In the third part, I will argue that typological alternatives (parameters) are just those grammatical properties that are the first to be derived from input. Once set, they determine the further developmental track towards the target grammar. This reminds of evolution. Preceding stages determine the way in which the subsequent stages adapt to the environment. Environment in the case of first language acquisition is the adult input language that the child's system gradually

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adapts to. The fact that typological properties are derived from input, rather than being a priori parametric alternatives, does not prevent them from characterizing major alternatives in language design. To the contrary, the fact that they are the first to be acquired causes them to influence the further course of acquisition. The reason for language types to be there and to remain so is that they enable an acquisition strategy. It is not claimed here that the language type enters the acquisition procedure as a bunch of typologically representative patterns that are further elaborated upon as in Tomasello (2003). Rather, I will argue that each acquisition step, including the ones towards a certain language type, develops a category that is stored in the lexicon and that is characterized by combinatorial properties. No phrase is used by the child unless all its lexical elements have a provisional categorial label. The somewhat odd forms of early child language can be derived and explained from that principle.

The evolution of a minimalist grammar in language acquisition needs no more than two elementary types of acquisition steps, both based on a locality frame. One type of acquisition steps serves a *Merge* construction and its categories, and the other one a *Move* construction and its categories. Both steps derive their categories and combinatorial principles from a simple and local pattern. The eventual intricacy of grammars follows from a study of elementary distinctions. It may be that even the most elementary forms of grammatical combinations imply a standardized, but abstract semantic relation. The discovery of such semantic distinctions may require a flexible awareness of possibilities.

1.2. A paradoxical fact

In child language some properties of the target grammar are acquired before others. Initially, some children make more headway in matters of grammar than others, but in the end they succeed all and more importantly, they all succeed along the same line of partial acquisition steps that is implied by the target language. The order of acquisition steps gives an important indication how a first grammar is acquired (see also Brown 1973). The empirical case presented here is the acquisition of root wh-questions in child Dutch (and other Germanic V2 languages) as opposed to the same procedure in child English (an $SV_{fin}O$ language).

The order of acquisition steps in the two language types is strikingly different. When acquiring wh-questions, English children use wh-pronouns from the start. The first wh-questions, though, lack a finite verb, see (1) (Klima and Bellugi 1966). The English child introduces the finite verb in a later acquisition step. See the adult examples in (2), that appear later in the speech of the English child.

(1) a. what that?
b. where bear go?
c. how I get in?

(2) a. what is that?
b. where does bear go?
c. how will I get in?

Children acquiring a V2 language like Dutch, German and Swedish, rather start their wh-questions with the finite verb in clause-initial position and they avoid the wh-pronoun. See the early child language examples in (3).

(3)		child Dutch	child Swedish	child German
	a.	is dat nou?	är det den?	ist das denn?
		is that then?	*is that then?*	*is that then?*
		'What is that?'	'What is that?'	'Wwhat is that?'
	b.	moet dat nou toe?	är den andra bilen?	sitz du denn?
		must that now at?	*is the other car?*	*sit you then?*
		'Where must that go?'	'Where is the other car?'	'Where do you sit?'
	c.	gaat deze nou open?	öppnar man då?	geht dass denn?
		goes this now open?	*opens one then?*	*goes that then?*
		'How does one open it?'	'How does one open it?'	'How does it go?'

Dutch, German and Swedish children introduce the wh-pronoun in the first position in a later acquisition step (Tracy 1994 for German, Santelmann 1995 for Swedish, Van Kampen 1997 for Dutch). See the adult examples in (4), that appear later in the speech of the Dutch child.

(4)		Dutch	Swedish	German
	a.	wat is dat?	vad är det?	was ist dass?
		what is that?	*where is that?*	*is that then?*
		'What is that?'	'What is that?'	'What is that?'
	b.	waar moet dat toe?	var är den andra bilen?	wo sitz du?
		where must that at?	*where is the other car?*	*where sit you?*
		'Where must that go?'	'Where is the other car?'	'Where do you sit?'
	c.	hoe gaat dit open?	hur öppnar man?	wie geht dass?
		how goes this open?	*how opens one?*	*how goes that?*
		'How does one open it?'	'How does one open it?'	'How does it work'

What causes the order preferences in child English (1) and child Dutch (3)? The acquisition difference cannot be due to a mere frequency difference in the input. All Dutch wh-questions start with a wh-element, as in English. I will argue that the difference in acquisition order can be explained as the solution to system-internal problems. Thereby, it will support my contention that grammar evolves as a learnable non-biological construct. The order difference indicates that the acquisition device is attentive to the typological properties of the core grammar. The first question is how the child detects such typological properties, in the present case Dutch, as a V2 language, versus English, as a $SV_{fin}O$ language.

Let me formulate the kind of answer that I will develop. The child cannot attend to all data at once and she does not even try to. She applies a massive data reduction instead, and she subsequently builds a grammar for the residue only. That residue determines what new facts can be accommodated. The reduction procedure needs no innate, biologically pre-wired, knowledge. It is based on ignorance. Assuming that, a different acquisition path for wh-questions in

English versus Dutch is unexpected, since both languages have parallel constructions for their non-subject root questions. See the examples in (5)

(5) a. English: what have you bought?
Dutch: wat heb je gekocht?
b. English: where can I buy a sandwich?
Dutch: waar kan ik een sandwich kopen?

The constructions in (5) begin with a wh-phrase followed by an inversion of finite verb and subject. English and Dutch use the same shifts with the same categories. They move the wh-element to Spec.C and they move the finite verb to the C-position.[1]

(6) a. Move a <+wh> element to Spec.C
b. Move a <+fin> element to C°

Both languages get their root questions by the same two movement types. English, a "residual V2" language, differs from other Germanic languages by allowing subject-verb inversion for only a small group of functional verbs (modal and auxiliary verbs, so-called "Auxes"). The other Germanic languages ("regular V2") allow inversion for any finite verb and moreover allow it for questions as well as topicalizations. The subject-verb inversion indicates for both systems that the initial notion "topic" turns into the notion "subject". "Subject" is definable as a clause-internal argument in real grammar. It combines with a predicate category, whereas "topic" is definable as a pragmatic distinction in proto-grammar. It prefers the initial position and names the aboutness of the utterance (cf. Krifka 2007). One would expect that the primary learners of non-English are better prepared than the learners of English to acquire wh-words and inversion. The examples presented in (1) and (3) show that this is not the case. Dutch, German, as well as Swedish children start to use V2 and subject inversion early, especially for modals and copulas, but they delay the introduction of wh-words. English children, by contrast, introduce wh-words early and rather delay the residual V2. Different primary systems (V2 Germanic, residual-V2 English) apparently invite different data-selections for wh-questions. This difference in acquisition paths between the two languages is intriguing, since the grammatical forms themselves seem identical, cf (5).

1.3. The longitudinal picture

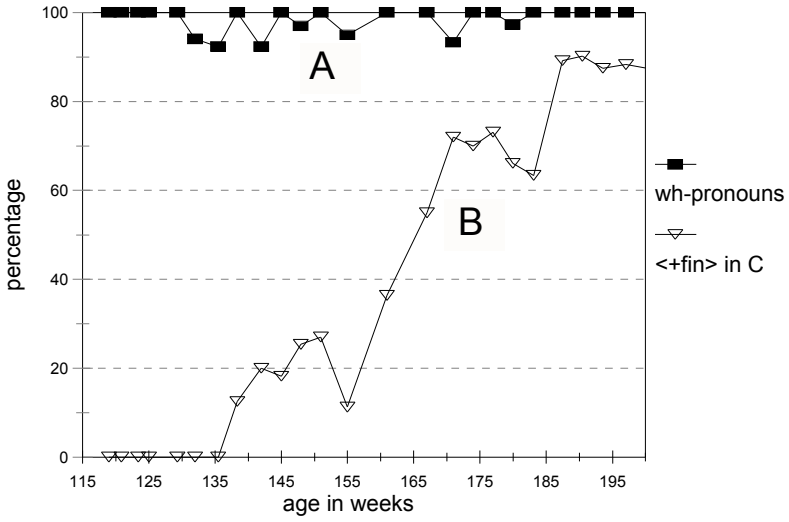
The claims about the different order of acquisition steps in English and Dutch are not based on impressions. For each acquisition step and each child one may construct a longitudinal graph. Once scattered data begin an irreversible rise towards the adult norm, the child gets the pattern. I will assume that the child has reached the acquisition point when the graph is around the 85-90% conform

[1] English subject wh-questions are left out. A questioned subject does not move in English ("vacuous movement", Chomsky 1986:48), and fits into the general $SV_{fin}O$ pattern.

to the adult norm (Brown 1973). I have constructed longitudinal graphs of the development of wh-pronouns and finite verb movement to C° for American-English Sarah (Brown corpus) and for Dutch Sarah (Van Kampen corpus). See Evers & Van Kampen (2001: 23-28) for a detailed account of the data selection. The findings are based on the language development of two children, but the picture is confirmed by a longitudinal study of other children. The acquisition speed of children may differ, but the order of the steps is fixed and typologically determined. Typological features are simply those that are acquired first (Van Kampen to appear).

English only applies a movement of the finite verb to the C-position in root questions for the restricted set of Auxes. This so-called "residual V2" (Rizzi 1990) is acquired late. It obviously is a difficult thing to get and the children delay it until the second half of their third year, which is very late in child language. By contrast, the English wh-pronoun appears one-and-a-half year earlier, which is early in child language. Even more important is the fact that the use of the wh-pronoun is instantaneous. There is no period in which the English learning child omits the wh-pronoun.[2] See graph A in (7).[3]

(7) English: A<+wh> → B <+fin> in C°(Sarah, Brown corpus)



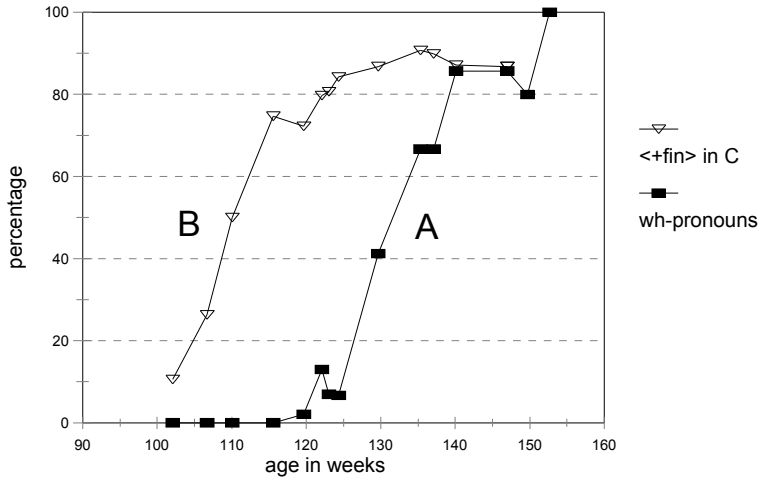
Graph A <+wh> in front: at 2;3 instantaneously.
Graph B <+fin/<+aux> to C°: 2;3-3;7. Its rise takes more than a year.

The Dutch acquisition path is completely different. Dutch is a V2 language and the finite verb always moves to the C-position. The Dutch children begin with the V2 rule around their second birthday, and it may take them some 4-5 months to establish the V2 rule. During that half year questions are posed, but the use of wh-pronouns is avoided. It is only after the V2 rule has been established that the wh-pronouns come in. When the wh-pronouns come in, they are not acquired

2 Graph A in (7) shows that child English sometimes drops the wh-pronouns, but as an exception only.
3 Repetitions and imitations were left out.

instantaneously. It takes again some 4-5 months for Dutch Sarah before all constituent questions appear with a wh-element. See the graphs in (8).

(8) Dutch: B <+fin> in C° → A <+wh> (Sarah, Van Kampen corpus)

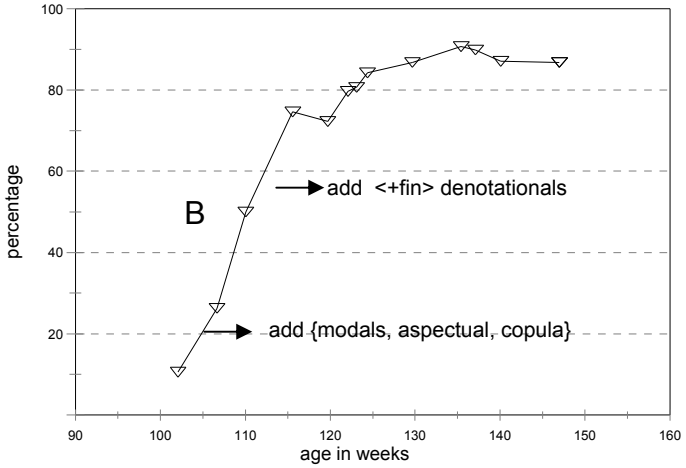


Graph B <+fin> to C°: between 2;0-2;5. Rise graph takes 4-5 months.
Graph A<+wh> fronted: between 2;0-2;8. Rise graph takes 4-5 months.

When comparing the instantaneous English graph A for wh-pronouns in (7) and the developmental Dutch graph A for wh-pronouns in (8), one may notice how outspoken the English/Dutch differences are. In a nice counter-balance see the graphs B for V<+fin> movement in (7) and (8). English residual V2 (graph B in (7)) is slow and delayed when compared to Dutch V2 (graph B in (8)). It takes American-English Sarah a full year. The acquisition of V2, graph B, for Dutch Sarah is around week 125. Shortly after that point, the Dutch graph for wh-pronouns begins to rise. The point I want to make here is the A/B acquisition order, not the timing differences between the two Sarahs. Some children make more headway in matters of grammar than others, but that is not interesting. The relevant point is elsewhere. The order of acquisition steps is the same for all children given a target language. That order betrays the child's decoding procedure.

The question why residual V2 is low as compared to full V2 gets even sharper if one looks at the finite verbs that establish the V2 type in early child Dutch. These are all the very Auxes (modals, copula; and in addition for Dutch the aspectual *gaan* 'go') English applies residual V2 movement to. Dutch children start with finite denotational verbs only later (De Haan 1987; graphs from Evers & Van Kampen 2001). Graph B in (8) can therefore be refined as in (9).

(9) Dutch Sarah: rise of <+fin> marked predicates in C^o



The graph for Dutch in (9) reflects <+fin> for early wh-questions, but also <+fin> for declaratives: *(papa) moet doen* '(daddy) must do', *k-ga even kleuren* ('I go just color' = I will color), *dit is beer* ('this is bear').

I will now argue that the English $SV_{fin}O$ type leads child language towards a topic-oriented proto-grammar, whereas the Dutch V2 type leads towards a clause-operator proto-grammar. That difference in proto-grammar dictates the difference in the <+wh> acquisition order.

2. The child's strategy

2.1. Input reduction

The central idea is that the child begins by a massive reduction of the input. It should be possible to predict the first steps in language acquisition given an adult target grammar that is the input for the child, and an automatic filter that delivers a reduction on the input. This learning strategy is tried and checked below.

The reductions can be seen as part of a decoding procedure: leave out temporarily all elements that you cannot sufficiently identify yet. Initially, the child starts with learning single word-signs. Subsequently, the child combines two words to binary structures. The initial strategy is formulated in (10).

(10) *Input-reduction filter*
- a. Leave out all that you do not recognize.
- b. Restrict yourself to single binary combinations of pragmatically interpretable items.

The input-reduction filter formulated in (10) is based on the grammatical ignorance of the acquisition procedure, not on innate knowledge that informs the acquisition procedure which material to leave out where. The child is now bound

to leave out all grammatical markings as not interpretable. The residue then consists of words that are either a) denotational words that are interpretable in the pragmatic situation or b) pragmatic deictic elements, like demonstratives. The first grammar arises when two pragmatically interpretable words are combined in a binary construct. This initial proto-grammar without grammatical markings or categories appears in the schema in (11) as G_o. The target grammar appears as G_n. The acquisition series of intermediate grammars G_i elaborates on a corresponding picture in Chomsky (1975: 119f).

(11) G_o ---- $G_i \Rightarrow G_{i+1}$ ---- G_n

The transitions in the series are discrete. Each transition step adds a functional feature F_i and stores it as a property of a lexical item or a property of a category of lexical items. Longitudinal graphs show how an addition is optional first, becomes more frequent and then turns into a grammatical obligation. As long as the possible constructional contexts are still limited, no more than one single grammatical feature is learned at a time together with its distribution. This recapitulates the Single Value Constraint in formal learnability (Berwick 1985, Berwick and Weinberg 1984, Clark 1992, Gibson and Wexler 1994). A more careful analysis of acquisition steps may show how certain grammatical features cannot be acquired before others have been established. To offer a trivial example, agreement on the finite verb cannot be acquired before the category <+D> has the features for person and number. See for a quantitative support of this claim Van Kampen (2005, 2006a). The acquisition procedure re-traces a categorial learnability hierarchy that is imposed by the system.

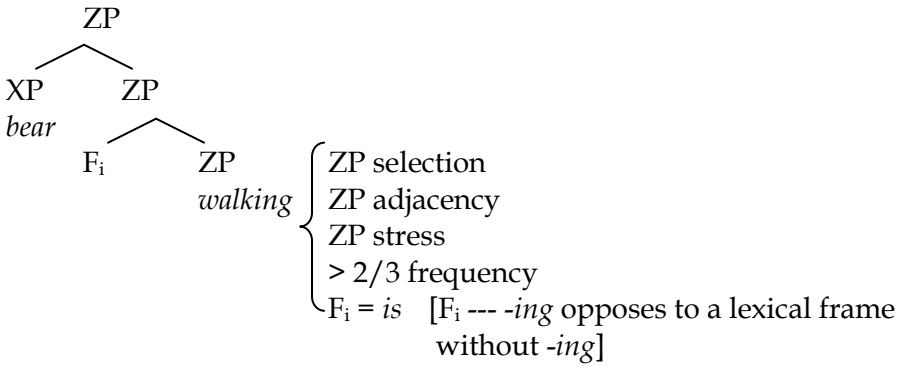
Each new acquisition step is a pattern recognition, defined an "evidence frame" in (12) (Evers & Van Kampen 2001, 2008). From a somewhat more abstract way of looking at the acquisition steps the language acquisition procedure needs two types of evidence frames in parallel with the generative devices "Merge" and "Move".

(12) a. Adding a new category/grammatical feature to a reduced pattern. (Merge)
b. Moving a category/ within the reduced pattern. (Move)

Hopefully, the acquisition procedure will only need these two types of maximally simple pattern-recognition ("treelets" Fodor 1998; Sakas & Fodor 2001) to derive grammar from input.

Adding a new category/grammatical feature F_i to a reduced pattern by Merge is illustrated in (13) for the English auxiliary *is*.

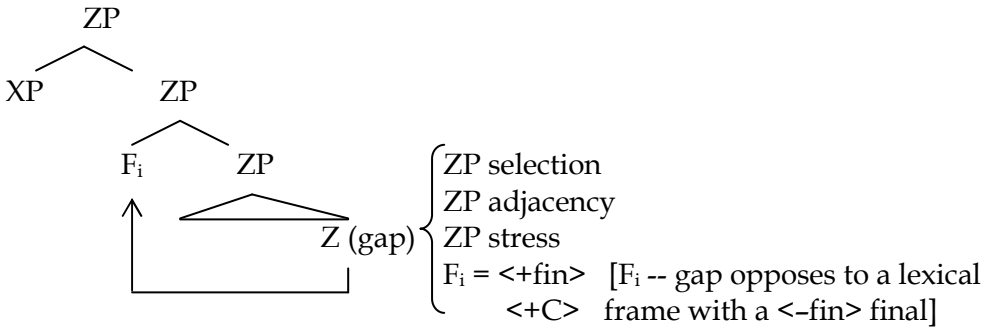
(13) Treelet for <+fin>/<+aux> Merge



The child must already have pragmatically understood that *walking* was about the 'actual moving around person *bear* '. Adding the grammatical marking turns the "comment" into a grammatically identifiable predicate. The designated element F_i and its function is input identifiable. It need not be selected from an a priori set, but is acquired on "robust evidence". The addition becomes obligatory when the evidence frame supports the feature for > 65%. The rest {bear loves walking; bear walking along found the honey; etc.} is disregarded by the acquisition procedure.[4]

It is claimed here that the lexicon inspires the underlying structure (cf. Evers & Van Kampen 2001, Tracy 2002, Van Kampen to appear). Due to the lexicon the learner returns to the original frame from which the new and perceived pattern can be derived.

(14) Treelet for <+fin> head movement



The reduction procedure then triggers the two steps in (15).

[4] A discussion about the learnability of island effects in Pullum (1997) and Yang (2002) mentions input data percentages of 0.03% versus 1.2%. Such percentages seem to me conceptually unfortunate. The amount of data that reaches the child's eardrums is basically irrelevant. For example, the percentage supporting the Dutch V2 rule is near to 100% and the use of articles before nouns is perhaps 75%. Yet, the child manages to disregard all that evidence until she gets hold of the relevant evidence frames. Quantities of input data are relevant only if related to an evidence frame. For a child language analysis along these lines of the island effects mentioned in Pullum/Yang, see Van Kampen & Evers (2006), Evers & Van Kampen (2008). For an analysis along these lines of island effects in long wh-movement, see Van Kampen (2008).

(15)

a. Reduction of the input yields a simplified binary basic set to get the elementary pattern for F_i .
b. The reduced pattern highlights minimal extensions F_i that make the pattern more "adult", that is less reduced. The minimal distinctions between the reduced pattern and the perceived one select the data that are evidence for the step towards F_i .

The recognition of a category, c.q. grammatical feature, in a set of elements is the truly innovating step. It need not come "easy". The merging of the new category also involves an abstract semantic function. These functions may be based on a few simple oppositions of tense, aspect and definiteness, they are at the same time abstract, language-specific and very hard to come by in second language acquisition later in life. The amount of elementary patterns that are needed in the beginning may run into six digits of elementary acquisition opportunities (Hart & Risley 1995, Evers & Van Kampen 2001: 44). Binarity, recursivity (stacking) and locality of movement or the local reach of functional categories follow from the locality of the evidence frame. Such properties in grammar need not be innate in the sense of organs like the eye or the ear. The grammatical properties are rather are taught by the system as simple solutions already selected in history for their learnability by means of successive elementary steps. See e.g. Van Kampen (2008) for an analysis that derives long wh-movement and wh-islands in Dutch from the elementary properties.

In short, the input reductions do not yield some sloppy set of deficient forms. One may rather define them as stages in a procedure for systematic decoding. One may suspect that the system is designed for that kind of decoding. Let each acquisition step be equivalent to adding a grammatical feature F_i to the lexicon. That addition (morphological, syntactic and semantic) takes place within an elementary syntactic "treelet" as in (13) and (14). Once the acquisition step has been made, the elementary treelet disappears and the grammar enriched lexicon remains.

(16) The grammatical feature F_i infects a lexical item due to a repetitive local context that unites
   a. A morpho-phonological form
   b. A binary syntactic context
   c. A semantic distinction

The images of an acquisition "treelet" infected by features are taken from Fodor (1998, 2001) and Roberts (2001). An important difference is that both these authors still assume that treelets/features are determined by innate factors, a line of reasoning not followed here.

In the remaining of this paper, I will show the plausibility of the present approach by a longitudinal picture of wh-question formation in the speech of Dutch Sarah and American-English Sarah.

2.2. Proto-grammar

The binary constructions by which children start their grammatical career in Dutch and in English are different due to corresponding differences from the typologically different inputs (V2 and $SV_{fin}O$). The first reductions to binary types show a denotational that characterizes the situation supported either by a topic name, or by an illocution operator. They may be analyzed as a kind of topic adorned comment or an operator adorned comment, see (17). The combination of a comment with an operator or a topic has again the pragmatic status of a "comment", i.e. a simplex or binary characterization of the situation at hand.

(17)

	comment<+topic>		comment<+operator>	
	topic	comment	operator	comment
English $SV_{fin}O$	*daddy*	*do*	*wanna*	*bear*
	door	*open*	----------	
	rabbit	*on*		
Dutch V2	*papa*	*doen*	*moet*	*doen*
	deur	*dicht*	*kannie*	*dicht*
	Nijntje	*op*	*is/zit*	*op*
			wil	*beer*

The comment is some denotational characterization of the situation whether adorned by a topic or an operator or not. The operator may be defined as a standard addition for an illocutive orientation. The topic may be defined as a standard addition for an aboutness orientation. The grammatical development sets in when the comment begins to require a topic or an operator of a certain kind. This is modeled by the context features added in (17) to "comment". The relation between the two elements in the binary construction is pragmatic and need not be different from the relation between utterances of two single words in a discourse. That pragmatic relation may develop into a standardized grammatical one, with the properties mentioned in (16). In this way, recursivity (applying words to words and phrases) emerges naturally.

The difference between $SV_{fin}O$ and V2 input reduction causes that $SV_{fin}O$ child English tends to begin all declaratives with a subject, i.e. the topic. Child V2 Dutch may begin a declarative with a topic/subject, but it need not do so. Questions and declaratives may as well start with a finite (modal) verb, i.e. the illocution operator in child language. The topic/subject in early child Dutch declaratives is far less likely (28%) to appear in clause-initial position than the operator/V<+fin> (72%).[5] Sarah's score for declaratives between week 110-125 is

[5] Strictly speaking, the topic from proto-grammar can be reinterpreted as subject only after it is obligatorily present and after its position and its case and phi-features become predictable given the comment. The systematic relevance of case and phi-features appears after week 145 for Dutch Sarah with the acquisition of D^o. See graph D in (29) (Van Kampen to appear). Early child language turns thereby into later child language. All pragmatic (situation-oriented) categories are replaced by syntactic (clause-internal definable) categories. I

listed in (18) (from Van Kampen to appear). Week 125 is the acquisition point of V2 for Dutch Sarah. The high amount of subject/topic-less utterances (18)c is due to the modals that appear as subject-implied factors (Van Kampen 2006b).

(18) Dutch Sarah week 110 till 125 ("acquisition point" V2)
(Relative % of all declarative V<+fin> sentences; out of 595)

a. Subject-V<+fin>	28%	clause-initial *topic*	28%
b. V<+fin>-Subject	21%	clause-initial *operator*	**72**%
c. V<+fin> (no subject)	51%		

English children, by contrast, pay more attention to the topic-comment types. This will soon determine the further development. Typological factors derived from input take effect as (non-biological) determinants for the evolution of grammar.

Both elements in the front-field, topic and operator, are optional in proto-grammar. The presence of the comment is in principle obligatory. The topic and operator are word-status elements (no clitics or affixes) and they are added to a denotational comment.[6] Proto-grammar for both language types shows de facto a single front field element, either a single topic or a single operator. The topic may be informally characterized as a word with a pragmatic aboutness function. It defines what the binary combination is about. The operator may be informally characterized as a word that signals a pragmatic illocution.

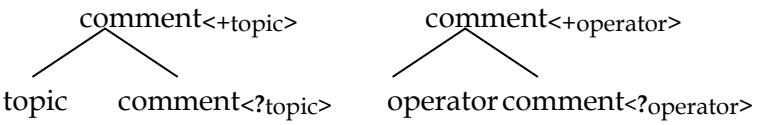
(19) Optional front field

single topic		*single operator*	
function:	aboutness	function:	illocution
type:	name	type:	constant

The distinction between unadorned and adorned "comment" evolves into a new system when topic and operator become obligatory in discourse-free statements (the non-answer statements).

The either single topic or single operator for a comment can be modeled as in (20).

(20)



The comment label continues to be a denotational characterization of the situation when the grammar is extended to three-word combinations. A set of

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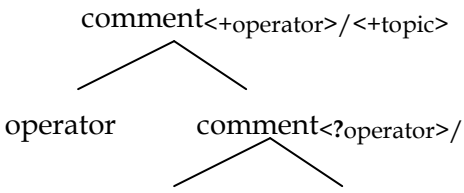
propose that the child arrives at that stage when all lexical items are appropriately marked as {<±C>, <±I>, <±V>, <±D>, <±N>}.

6 Clitics and affixes are acquired due to a re-analysis that will take place only after the full-sized variants of the construction have been analyzed and acquired first (Van Kampen 2001).

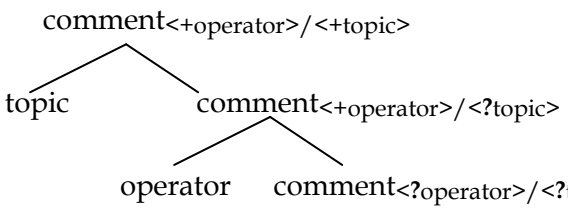
three member utterances that appear in early child Dutch can be seen as rearrangement of the label "comment" as in (21). The examples are from Sarah before week 122. The structures (21)a and (21)b are semantically equivalent options.

(21) a.



	topic	comment<?operator>/<?topic>	
moet	beer	slapen	
must	*bear*	*sleep*	'The bear must sleep'
is	nijntje	op	
is	*rabbit*	*on*	'There is a rabbit on it'
kom(t)	auto	aan	
comes	*car*	*on*	'A car is coming'

b.



	operator	comment<?operator>/<?topic>	
beer	moet	slapen	
bear	*must*	*sleep*	'The bear must sleep'
vliegje	is	weg	
fly	*is*	*gone*	'The fly has gone'
mama	moet	ook	
mummy	*must*	*also*	'Mummy must also do that'

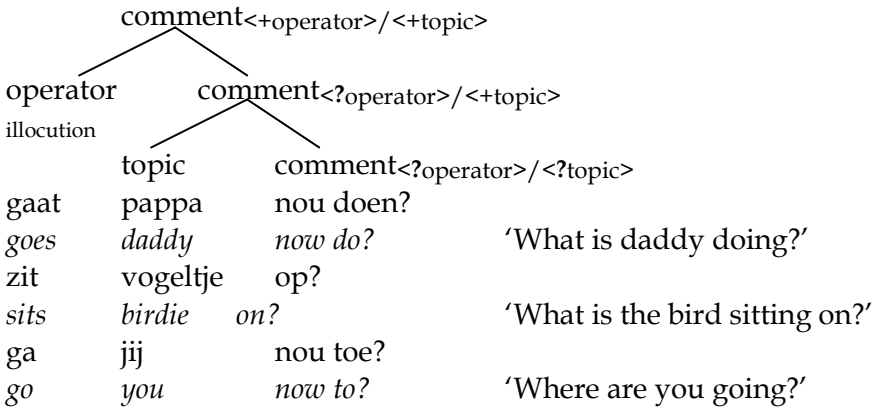
The binary structure from (17)/(20) is maintained in (21). Either an operator is added to a topic-comment structure as in (21)a, or a topic is added to an operator-comment structure as in (21)b. The sustained binarity for recursive stacking ("asymmetric Merge" Chomsky 1995) of comment structures need not be considered as a grammar-specific constraint, something given as a grammatical a priori. Binarity simply makes use of parts that were already known as analyzable. This "evolutionary" economy continues to operate and establishes binarity as a general frame preferred for grammar. A triple non-stacking tree is less likely to survive in daily use as it is not supported by previous steps whereas stacking by binarity branching is. I see no clear arguments to consider binarity and recursion as grammatical properties that could not emerge naturally. When a pre-grammatical language would consist of single word utterances, as in very early child language, the relation between such utterances must be a matter of pragmatic understanding. Under frequent use, that pragmatic understanding might standardize to a set of fixed relations that can be supported by a grammatical form of order, inflection or an additional functional word.

The re-combinations in (21) maintain the restrictions known from (17)/(20) that utterances allow a single operator and a single topic only. Later on this type of additions and local feature control will expand in respectively "(semi)-auxiliary cartographies" and multiple argument structures. Yet, at this moment in early Dutch child language the utterances are analyzable in as far as they restrict themselves to a single operator for "is an illocutionary unit". That single illocution operator is the later finite verb in first or second position.

2.3. Wh-question formation

Here I come to my central point. Relevant is not the mere frequency of the wh-construction, but the way it fits into the current child grammar G_i. The operator context of early Dutch adds a general operator (the later finite verb) to all illocutional utterances, declaratives and questions alike. An additional <+wh> operator requires operator stacking and is not welcome. The <+wh> element is systematically present in the adult input, but systematically disregarded in the Dutch proto-grammar, see (22).[7]

(22) Dutch proto-grammar: general illocution operator



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7 Adult Dutch may drop the wh-pronoun, but only rarely so. I counted in the speech of Dutch Sarah's mother (files 09-23; child's week 107-146) 10 examples out of 674 wh-questions, of which 6 were direct imitations of Sarah's wh-drop questions. The 4 remaining examples were of the type in (i).

(i) ∅ ben je nou aan (he)t doen allemaal, Sarah? (file 13, Sarah week 122)
are you now on the do all, Sarah?
'What are you doing 'then', Sarah?

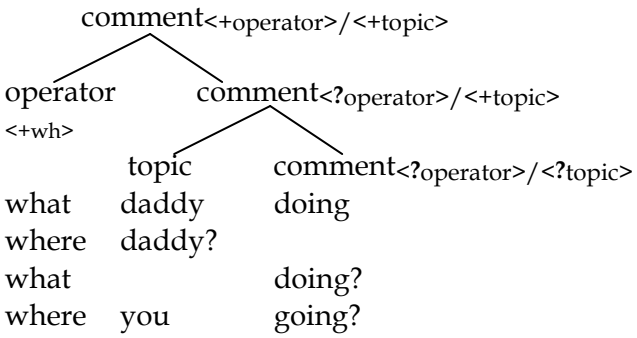
This type of wh-question modulates the impact of the demand expressed by the question. The use of the sentence adverbial *nou* expresses the speaker emotional state (surprise, irritation, disbelief, etc.) vis-a-vis the interlocutor's behavior. It is the only context in which the wh-pronoun is sometimes dropped in adult Dutch. A peculiarity of this type of question is the (almost obligatory) use of *nou*. Child Dutch (and the other Germanic V2 grammars) also use the sentence adverbial, but without the emotive intention which is beyond the child's pragmatic ('theory of mind') understanding. *Nou* is overused in child Dutch to make the predicate of questions when the <+wh> operator is blocked. It reduces to the adult norm when the wh-element is introduced. See for the overuse and disappearance of *nou* in child Dutch, Van Kampen (1997: 78f).

moet	dat	nou in?	
must	*that*	*now in?*	'Where must that go?'
komt		daar nou aan?	
comes		*there now on?*	'Who is coming over there?'

Dutch proto-grammar disregards <+wh> operators because its standard utterance requires a single sentence-typing operator, the later V2 finite verb. As we have seen in (18), 72% of the <+fin>/operator elements in early child Dutch declaratives are clause-initial.

The English proto-grammar is different. It does not introduce the general clause-initial illocution operator. For that reason, it allows the <+wh> illocution operator as a question-specific device, see (23).[8]

(23) English proto-grammar: <+wh> operator

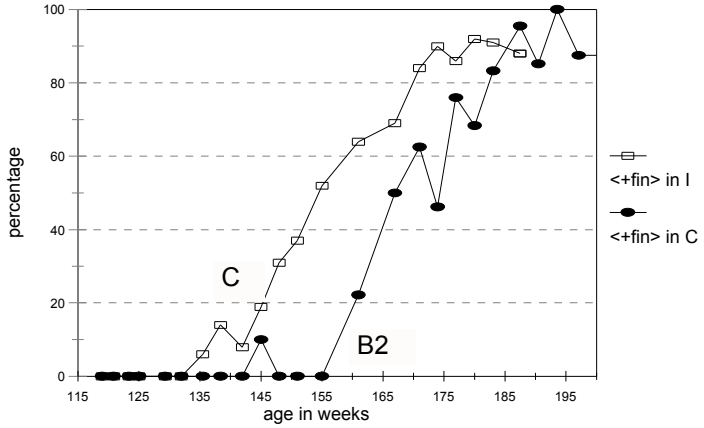


English proto-grammar allows the stereotype <+wh> operators, because its standard utterance does not have a sentence-typing operator.[9] The Auxes in English regularly mark the predicate that follow the topic/subject. Therefore, English proto-grammar cannot immediately fit in the residual V2 Auxes. Residual V2 left of the topic/subject is disregarded by the child as an anomalous case of inversion. This is reflected in the successive graphs in (24). The first graph, graph C, depicts the rise of Auxes in declaratives (*I <u>can</u> see daddy*). The succeeding graph, graph B2, depicts the rise of inverted Auxes in yes-no questions (*<u>can</u> you see daddy*?). It shows that the (non-inverted) Auxes in I^o is identified before the (inverted) Auxes in C^o. The Aux-subject inversion is obviously harder to acquire. See Evers and Van Kampen (2001) for a detailed account of the data selection.

8 The '*wanna*' construction mentioned in (17) is a '*wanna*' pattern, rather than a pattern for modals in general.

9 See also Radford (1990) for an analysis of early wh-questions in English as stereotypes.

(24) English Sarah: Graph C: <+fin>/<+aux> in I^o (declaratives)
Graph B2: <+fin>/<+aux> in C^o in yes-no questions



Graph B2 represents residual V2 in yes-no questions. The graph that establishes the residual V2 for American-English Sarah, graph B in (7), generalizes over wh-questions and yes-no questions. Graph B in (7) shows how it took American-English Sarah a full year to get the residual V2 in all questions. This extra long period of hesitation must partly be due to the cliticized forms of copula, modal and auxiliary verbs in English wh-questions. In the speech of English Sarah's mother, two-third (77%) of the auxiliaries and modals were cliticized to the wh-pronoun.[10] See some examples in (25).

(25) a. what'd he say ?
b. what's your doggie's name ?
c. where's the little doggie ?
d. whyn't [: why don't] you go play with Bobo?
e. what's the boy sitting on ?
f. who's Daddy got ?

This opposes to V2 Dutch. The Dutch modals and auxiliaries are explicitly present in the input as clause-initial operators. The copula/auxiliary *is* may be cliticized in Dutch, but most of the time the full form is used. A count of the copula and auxiliary *is* in CHILDES showed 70% cliticization in adult English (Brown corpus) versus 6% in adult Dutch (Groningen corpus and Van Kampen corpus). See the table in (26).

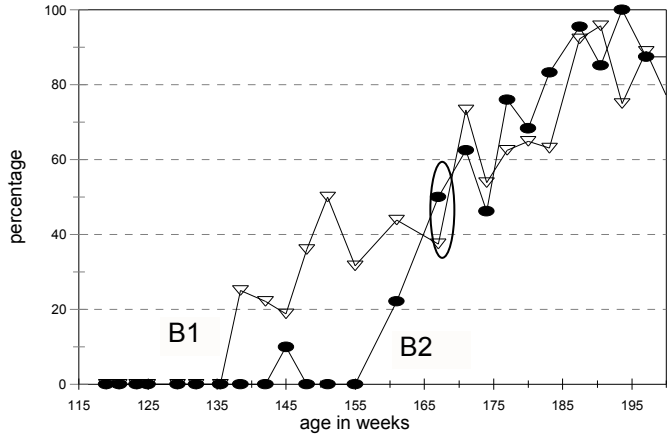
(26) Adult input of cliticized and full copula/auxiliary *is*

	Total *is* and *'s*	Full *is*	Clitic *'s*	
Dutch (all files Groningen + Van Kampen corpus)	29606	27872	1734	**6%**
American-English (all files Brown corpus)	16263	4926	11337	**70%**

[10] I counted the wh-questions in the files 1-17, Sarah's week 118-133, just before the rise of the <+fin> graph (graph B in (7)). In these 17 files, Sarah's mother used 493 wh-questions. Of these 493 wh-questions 380 (77%) had an Aux cliticized on the wh-element.

One may assume that cliticized forms, i.e. the auxiliaries in English, will not trigger anything until the non-cliticized forms have been acquired and the re-analysis of the cliticized forms becomes possible (cf. Radford 1990, Van Kampen 2001). This becomes clear when one splits up graph B from (7) in a graph B1 and B2, as in (27). Graph B1 represents the residual V2 for wh-questions. Graph B2 repeats the residual V2 for yes-no questions in (24).

(27) English Sarah: B1: <+fin>/<+aux> in C° in wh-questions
B2: <+fin>/<+aux> in C° in yes-no questions



The two graphs more or less coincide from the encircled point at week 167 on. Before that point graph B1 already has set in quite high. This might be due to the fact that the contracted form has not yet been identified as a cliticized "Aux". The contracted forms in the English wh-questions do not become analyzable before the auxiliary, copula and modal verbs have been acquired separately in yes-no questions. The respective graphs then join at week 167 the general development in B2 that might be characterized "residual V2". After week 167 the acquisition of <+fin> in C° follows a uniform development.

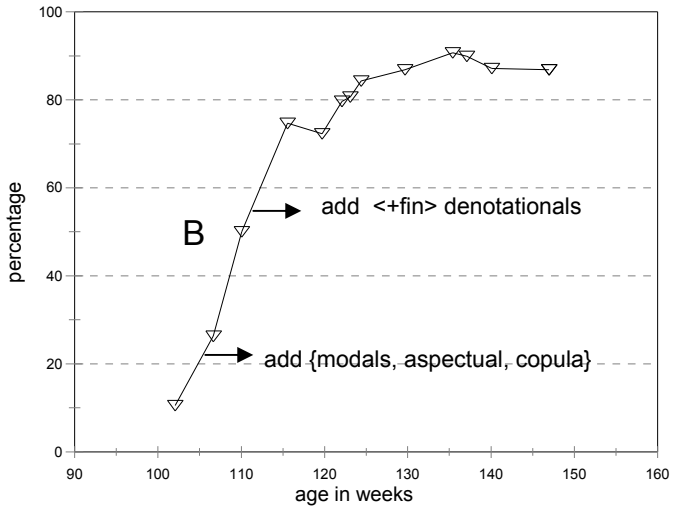
In sum, although the wh-elements are clearly and explicitly present in the English and in the Dutch input alike, the "single operator only" restriction causes the disregard of the <+wh> operator in Dutch proto-grammar. The type of proto-grammar creates a selective environment for certain acquisition steps only. As long as <+wh> functions as a question operator, it can be added in child English proto-grammar, but not in child Dutch. English proto-grammar will not select <+fin> Auxes in wh-questions, because they are not generally present in the input as clause-initial operators as they are in V2 Dutch.

2.4. Real grammar

The acquisition difference between the wh-elements in English and Dutch has been derived from a difference in their proto-grammar. There appeared a topic-oriented proto-grammar from the English $SV_{fin}O$ input versus an operator-oriented proto-grammar from the Dutch V2 input. Proto-grammar is the first attempt of the acquisition procedure. Its parts (comment, operator, topic) have an

immediate pragmatic function for the utterance as a whole. The first non-pragmatic categories that emerge in Dutch are <+V> and <+fin>. In adult Dutch, a third of the <+fin> operator elements (tokens in CHILDES corpus) are variants of denotational comment elements and two third of the <+fin> operator elements (tokens in CHILDES corpus) have a non-denotational background (auxiliaries, copulas, aspectuals, modals). The graph in (9), repeated here as (28), shows how the operator-marking in child Dutch rises. The amount of operator types (copula, aspectual, modals) rises as well.

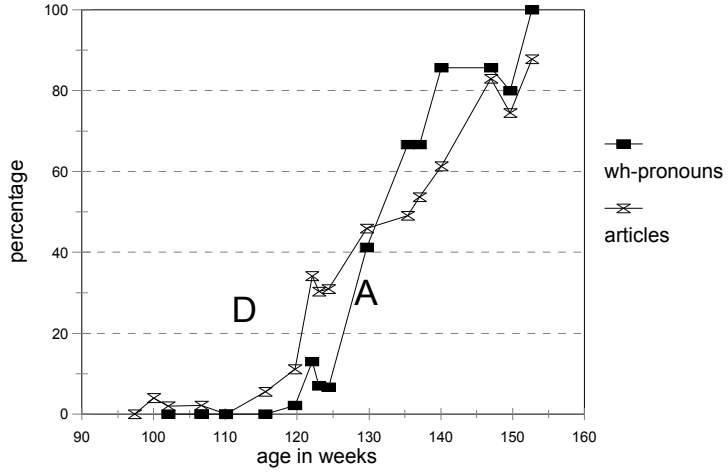
(28) Dutch Sarah: rise of <+fin> marked predicates



At a certain moment, indicated in the graph, the amount of operator types rises by the use of denotational forms with <+fin>-marking, i.e. *beer slaapt ook* ('bear sleeps too'), *ik heb snoepje* ('I have candy'). This allows a reinterpretation for the categorial status of lexical items that are involved. All elements that are marked as <+fin> are part of a morphological paradigm <+V> and illocution operators (see Evers & Van Kampen 2008 for a discussion). The other way around, sentence operators tend to get interpreted as <+V, +fin>. The <+fin>-marking turns the <+V> in V2 Dutch into a sentential operator. The <+V> elements can be combined with topics/subjects and complements (direct, indirect, prepositional objects). The same type of elements (names/nouns) can be used in all these positions. The name-like elements tend to be marked by the same functional element (article or article-like form), which, due to its frequency in the input, can be picked up by the child. At the moment that the V2 <+fin> graph in (28) passes the acquisition point at week 125, the <+V> associated topic/subjects and complements (direct, indirect, prepositional objects) begin to be marked by the articles or article-like elements. In this way, the category <+V> gives rise to argument structure frames that are to be stored in the lexicon as well. The names used in the argument positions give rise to the article-like category <+D>. See the rise of articles in the speech of Sarah in (29). The interesting point is that the graph for determiners D<–pro> (articles), and the graph for free anaphoric pronouns (3rd person pronouns) D<+pro> coincide with the graph for D<+wh> (wh-pronouns), graph A in (8). For Dutch Sarah, these

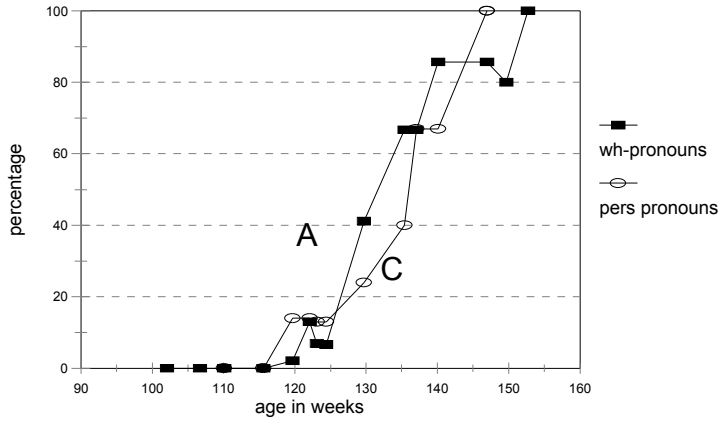
three graphs reach the acquisition point around the age of 2;9 (week 145). The diagram in (29) compares the acquisition of question pronouns (graph A) with the acquisition of articles (graph D).

(29) Dutch Sarah: Graph A: D<+pro, +wh> (question pronouns)
Graph D: D<–pro, –wh> (articles)



The diagram in (30) compares the acquisition of question pronouns (graph A again) with the acquisition of 3rd person pronouns (graph C).

(30) Dutch Sarah: Graph A: D<+pro, +wh> (question pronouns)
Graph C: D< +pro, –wh> (3rd person pronouns)



All these graphs for Dutch Sarah nearly coincide. They represent a more abstract phenomenon, the grammatical marking of discourse reference and clausal argument structure by the category <+D>. Just after the acquisition of V2 (at week 125), the use of the variant <+D> elements before names/nouns begins to rise. Argument structure gets established, once the predicate containing that structure has been shaped by a grammatical marking <+fin>. Predication (C^o/I^o) precedes reference (D^o). It takes the period between 2;4-2;9 (week 120-145) for Dutch Sarah's articles to reach the adult norm. The wh-element is a <+D> element too. The acquisition of Move <+wh> to Spec.C takes place as soon as

<+wh> is identified as a <+D> (determiner) in front of NPs. Reinterpreted as a D<+wh>, the <+wh> gets access to the clause-initial position. See some examples of <±wh> preposing in the speech of Sarah before and after the acquisition point at 2;9 (week 145).

(31) <+wh> preposing (wh-movement)

a. wat doet de beer?' (Sarah 2;5, week 127)
what does the bear ?
'What is the bear doing?'

b. welke wil je boekje? (Sarah 2;9, week 144)
which want you booklet?
'Which booklet do you want?'

c. welk boekje hebben we allemaal ? (Sarah 3;4, week 174)
which booklet have we all ?
'Which booklet do we all have ?'

(32) <–wh> preposing (topicalization)

a. die bewaar ik ook (Sarah 2;6, week 130)
that keep I too
'I will keep that one too'

b. de prinses is hele groot (Sarah 2;7, week 135)
the prinsess is very big
'The princess is very big'

c. de klitten probeer ik eruit te halen (Sarah 3;1, week 163)
the tangles try I out to get
'I try to remove the tangles'

I expect a parallel development for the grammar of English. The category <+V> can be acquired due to the aspectual opposition <± *-ing*> and the associated use of auxiliaries and modals in I^o, cf. the treelet in (13). Once the category <+V> has been established, argument structure can be acquired and get stored in the lexicon (as V^o DP frames and V^o PP frames). The <± wh> operators are subsequently reanalyzed as preposed DP arguments. English grammar still has to add the residual V2 for root questions thereafter, reanalyzing a bunch of cliticized "Aux"-constructions. The most important point, though, is the acquisition of the English D^o articles. Probably, I can maintain my thesis that the acquisition of <+D> is a matter of acquiring argument structure after the acquisition of I^o/V^o.[11]

[11] The English <±definite> article opposition *the/a* can be construed as following the I^o graph, i.e. graph C in (24). Yet, Sarah Brown, as well as other English acquisition children, shows a remarkable use of the element *my* well before the acquisition of I^o. The element *my* stands for a variety of functions in child English, first person possessor (D^o)marking being one of them (e.g. *see my doggie*). One might argue that this "possessive" *my* is situation-bound like the demonstrative *die* in Dutch proto-grammar. See Van Kampen & Zondervan (2005) for an analysis.

In sum, the Dutch/English difference in the acquisition of wh-questions is due to a difference in binary proto-grammar. Early child language turns into late child language by the three successive steps in (33).

(33) Successive acquisition steps

a. Proto-grammar

Dutch (V2)	English ($SV_{fin}O$-residual V2)
- fixed operator initials (modals) learned in declaratives - <+wh> operator blocked	- fixed topic initials learned in declaratives - operator possible as a stereotype <+wh>

b. Predicate marking

Dutch (V2)	English ($SV_{fin}O$-residual V2)
- <+fin> marking in C^o - category <+V>	- <+ *-ing*> marking in I^o - category <+V>

c. Argument marking

Dutch (V2)	English ($SV_{fin}O$-residual V2)
- argument structure <+D> marking - category <+N> - D<+wh> and move wh as argument reordering	- argument structure <+D> marking - category <+N> - D<+wh> and move wh as argument reordering

In acquisition step (33)c both grammars prepose the <+wh> argument in the initial C^o projection, The Dutch/English difference in <+wh> acquisition is a short-lived phenomenon of early child language that does not survive. Nevertheless, it demonstrates how fairly universal categories and redistributions are acquired from reduced stages of the language type. The order of acquisition steps supports the (minimalist) ideas that the grammatical patterns follow from input and general cognitive abilities. Indications for a biological pre-wired program fall away when it turns out that prospective universals like <+V>, <+N> and "move to C^o" are rather defined by and (non-biologically) derived from highly frequent language-specific hints in the input.

Nobody will deny that languages are learned from parental input. Yet, the abstract nature of grammatical categories and their complex interaction in the adult language made it questionable that the system could be learned by toddlers. The present proposal contends that the early learner reduces the input to small elementary constructions from which the various factors are identified and acquired. No reliance on biologically pre-wired forms is assumed.

3. Biological construct or cultural construct?[12]

3.1. The acquisition model

In a sense, the less one expects from an acquisition model of language, the more features of grammar one is likely to postulate as innate. Innate features need not be acquired. Somehow, they have already drifted in by neural evolution. By contrast, the present acquisition model sets a focus on the learnability of grammar. It needs no more than two elementary acquisition steps, one for a Merge pattern and one for a Move pattern. Highly abstract properties of grammar are subsequently derived from reduced input sentences. To the extend that this can be maintained, the acquisition model implies that the neural structures for grammar must have been acquired by learning, rather than being a pre-wired set of options that is innate due to the neural evolution of the species (Evers & Van Kampen 2008). The main points of the acquisition model put forward in the paper were the following.

Learning strategy

(i) There is an initial reduction of the input, such that the acquisition device selects the major typological properties (major parameters) of the core grammar. The reduction is due to ignorance about functional structure and not due to a priori information.

(ii) The input-reduction procedure directs the further development by selecting evidence frames that contain no more than one single functional category, i.e. grammatical feature, <F?>. Each acquisition step adds a grammatical feature F_i to the lexicon, (or adds a grammatical feature F_i to elements already listed in the lexicon), together with the elementary context for F_i. The context for F_i has appeared in the reduced input as a treelet (in the sense of Fodor 1998, 2001) and it has appeared as well (systematically) in the child's productions. This is demonstrated by constructing the longitudinal acquisition graph of F_i.

Learnability hierarchy

(iii) There is a natural order of acquisition steps, since some grammatical features need others in their minimal frame. This phenomenon explains the temporal order between the acquisition graphs.

(iv) The probably universal lexical categories V^o and N^o are not postulated but derived and acquired from their more language-specific functional environment, respectively the identified illocutionary value of C^o/I^o and D^o. See also Van Kampen (2005), Evers & Van Kampen (2008: 504f).

Outcome: the lexicon

(v) Although each grammatical feature is first captured within a minimal treelet, the initial grammar is not seen as a bunch of constructions as in Tomasello (2003). The acquisition model is aimed at building up a categorial lexicon that specifies the local combinatorial properties of its items.

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[12] The line of reasoning in this section owes much to work in progress with Arnold E. Evers (Evers & van Kampen in progress).

I demonstrated that the present acquisition model is able to set several categories and their parameters from input, such as the V2 parameter and the <+wh> parameter. The same model was effective in setting the OV parameter and the major lexical categories in Van Kampen (2005), Evers & Van Kampen (2008). When the model derives fundamental and typological properties from reduced input and does so in the same order as in actual child language, it becomes plausible that all grammatical properties will be acquired in that manner. Notice also, that it is not assumed that these categories and parameters are used as a prioris by the learner. They are rather imposed upon the learner by the treelets of the reduced input.

The simplified and repetitive structures produced by systematic input reduction are not postulated. They are manifest in actual child language. There, they allow that grammatical features are at first learned in a maximally simplified environment. Later on, the same features continue to function in more complicated environments as abstract and interacting factors. It must be an important formal property of natural grammars to have this build-in hierarchic learnability for the grammatical distinctions.

Dresher (1999) has made a simple, but now debatable, objection against UG features and their parametric form. He argued that the UG properties were too abstract and interacting to offer a reliable guidance to an acquisition procedure. In a sense his objection was a rephrasing of Chomsky's argument about the poverty of the stimulus. Yet, such objections, including the argument from the poverty of the stimulus, need no longer hold. The acquisition model proposed above made no direct use of UG features as such. It worked the other way around. The input patterns simplified by reduction impose such features on the learner. Once acquired, these features are stored in the lexical memory. That is, they are added to the various lexical items as context features. Fortunately, this property of grammatical context is already known as Chomsky's (1995) Inclusiveness Principle. Each time the lexicon is consulted, the (invariably) local context properties are bound to get deployed. The natural consequence is that early acquisition steps must have typological significance. They have established themselves in the lexicon and from there they control further properties. This was clearly seen by Jakobson (1942). He predicted typological significance and a more stable status for features acquired early, whereas features acquired later on were expected to show less stability in history and dialects. Jakobson's view translates easily in an acquisition difference between major parameters and micro-parameters. The actual discovery of such acquisition differences and their derivation from evidence frames is still to be made, but to my mind we know now where to look. Let me finally turn to the question whether a construct so much designed for diversity and learnability as grammar, must nevertheless be based on innate biologically given frames. As you may expect, I will answer this question in the negative.

3.2. The perfect language

Chomsky (2005) assumes three sets of determinants for the acquisition of

grammar (A) general cognitive abilities, (B) innate UG distinctions, (C) input sentences. He considers the possibility that the determinants in (B) can be minimalized. Minimal assumptions one must make about any combinatorial system would suffice to derive a grammar by means of (A) from input (C). A language controlled by such a grammar is called "perfect". It will not need the evolution of pre-wired task-specific neurology. He introduces a distinction, though, between a language faculty in the broad sense (FLB) and a language faculty in the narrow sense (FLN; Hauser, Chomsky & Fitch 2002). I interpret this in the following way. The language faculty in the narrow sense may in principle contain all pieces of grammatical furniture recommended as useful devices in generative grammars, {the system of categories, grammatical relations, binary parameters, projection of labels, locality, binarity, recursiveness, selectional hierarchies of adverbs and auxiliaries, case systems, chains, movements and their triggers, phi-features, agreement, pronouns, islands, binding principles}. If elementary acquisition principles derive all these distinctions from input properties only, language is "perfect" and to my mind revealed as a learnable cultural construct, rather than having a biological determinant. If by contrast it turns out that language is not perfect in the above sense, then it will require pre-wired innate task-specific neural constructs to acquire language. Then language is unlike the traffic system, a ballet choreography, or the stock market. Then, it is indeed the quirky offshoot from an autonomous innate neural construct and the bio-linguistic program is in business. This is not to deny that the combinatorial use of words is a novelty called "grammar". The novelty may emerge from a special neural organ, but it is not necessary to make such a drastic assumption. As a matter of fact, pragmatic and associative relations between content words are present in early pre-grammatical child language, when each content word is used as a separate utterance. These relations between single-word utterances may give way to a set of relations (argument structure, event structure, illocutional structure) applied in a standard way. It seems not unlikely that such standardization of word relations may be a natural outcome.

The acquisition analysis above suggests that the acquisition model can be aimed at analyzing language as perfect in the sense of it being a cultural and learnable construct, rather than a biological one. This is not yet a common stance among generative grammarians. Some of them consider it even the hallmark of the generative enterprise that the study of grammar should postulate an innate task-specific neural complex. None of the usual arguments seem to me convincing or even relevant. I will shortly review them as recently brought up in Piattelli-Palmarini (2008). Thereafter I will turn to the nature of the faculty of language in the broad sense.

Piattelli-Palmarini (2008) protests against the idea that grammar might be a cultural construct that caused as a secondary effect the evolutionary enlargement of the human brain, a view developed in Deacon (1997). Linguistic inquiry, Piattelli-Palmarini argues, has shown all kind of unexpected consequences and curious restrictions in grammar. This suggests, he feels, a biological source for grammatical distinctions. I do not see that point. Unexpected consequences and curious restrictions hold for any complex system, whether biological or cultural. As far as cultural constructs are concerned, one may think of the riddles in number theory. Piattelli-Palmarini (2008) is also in favor of a biological origin for

grammatical distinctions because children are said to acquire language "easily". I doubt that as an argument for the biological status of the construct. It rather seems that young children are unbelievably vigorous learners in all kind of physical, social or cultural competences. Within months six year olds get the basic tricks for reading, writing, drawing, counting, biking, playing the piano, swimming, knitting, tying ones shoes, and a variety of social games. Acquiring a language is but a bit different. It is an extensive device. Learning must begin earlier and will take longer, but the same prolific flexibility for learning is in action. Children start small and often one sees their short but considerable concentration. As for language acquisition, they remain engaged for years in a round-the-clock training with strong and immediate rewards. Relative ease in language acquisition may be no more than the impression of a somewhat distracted father. Another point that Piattelli-Palmarini brings up refers to the spontaneity of grammatical reactions. I do not get that point either. Reactions by trained participants in chess, soccer or music have to be immediate and spontaneous as well. That is the fun they yield. On the other hand, carefully wording a letter is the opposite of rambling off. It is true that verbal reactions from the top of one's head still fit the rules of grammar, but that holds no less for whatever rule-governed behavior. In general, conscious training in cultural constructs would not take place if it did not have such clear and selectional consequences. Grammatically governed achievements are no exception as is daily demonstrated in the school system and in society at large. And if this holds for the finer points of lexicon and grammar, why not for all points? And if this holds in history, why not in prehistory?

When grammatical systems seem designed for learnability and UG distinctions seem learnable by a few elementary steps that have a minimalist orientation, one need not postulate a task-specific and innately pre-wired neural system to offer the learner possible frames for grammar. The fully learnable grammar as a cultural construct is on a par with other constructs and inventions that human beings employ in order to survive, such as family structure, ways of gathering food, finding shelter, constructing tools, and preserving fire. When clans or tribes in completely different parts of the world show far reaching parallels between their cultural devices, from fishing gear to grammatical devices, this proves that these devices are parallel solutions to parallel problems irrespective of postulations about innateness.

Let grammar result from an extensive stacking of grammatical devices by a few elementary acquisition frames, as proposed above. Then it is less clear why criminally neglected children like Genie (Curtiss 1977) or otherwise intelligent chimps like Nim (Terrace 1979) did not succeed to make much of mastering a language. Plausibly, some pre-linguistic neural condition got damaged for Genie when she was prevented from exercising a language in childhood. As for chimps like Nim, that neural condition may have never been there to any sufficient amount.

The emergence of grammar must be dependent upon an environment that invites the frequent use of content words and the inventive flexibility of a young brain. Both factors are relevant anyway. One may of course postulate additional factors, such as genetically innate parameters of grammar, but these must remain

speculation. The major conclusion appears less speculative and more promising for advanced research in child language: Grammar is to be analyzed as fully learnable. Its intricacies should in the first place be explained by paying more attention to the stepwise procedure that is present in child language itself.

References

Berwick, Robert C. 1985. *The Acquisition of Syntactic Knowledge*. Cambridge, Mass: MIT Press.

Berwick, Robert C. & Amy S. Weinberg. 1984. *The Grammatical Basis of Linguistic Performance*. Cambridge, Mass: MIT Press.

Brown, Roger. 1973. *A First Language: the Early Stages.* Cambridge, Mass: Harvard University Press.

Chomsky, Noam. 1975. *Reflections on Language.* New York: Pantheon.

Chomsky, Noam. 1986. *Barriers.* Cambridge, Mass: The MIT Press.

Chomsky, Noam. 1995. *The Minimalist Program.* Cambridge, Mass: The MIT Press.

Chomsky, Noam. 2005. Three factors in language design. *Linguistic Inquiry* 36(1), 1-22.

Clark, Robert. 1992. The selection of syntactic knowledge. *Language Acquisition* 2(2), 83-149.

Curtiss, Susan. 1977. *Genie: A Psycholinguistic Study of a Modern-day 'Wild Child'*. New York: Academic Press.

Deacon, Terrence. 1997. *The Symbolic Species: The Coevolution of Language and the Brain*. New York: W.W. Norton & Company.

Dresher, B. Elan. 1999. Charting the learning path: cues to parameter setting. *Linguistic Inquiry* 30, 27-67.

Evers, Arnold E. & Jacqueline van Kampen. 2001. E-language, I-language and the order of parameter setting. *UiL OTS Working Papers* 00105-S-S. Utrecht: UiL OTS.
http://www-uilots.let.uu.nl/research/Publications/Publications.htm.

Evers, Arnold E. & Jacqueline van Kampen. 2008. Parameter setting and input reduction. In Biberauer, Theresa (ed.), *The Limits of Syntactic Variation*. Amsterdam/ Philadelphia: John Benjamins, 483-517.

Evers, Arnold E. & Jacqueline van Kampen. In progress. *Hierarchies of Learning Steps in First Language Acquisition*. Monograph in progress.

Fodor, Janet D. 1998. Unambiguous triggers. *Linguistic Inquiry* 29, 1-36.

Fodor, Janet D. 2001. Setting syntactic parameters. In Baltin, Mark & Chris Collins (eds.), *Handbook of Contemporary Syntactic Theory*, Oxford: Blackwell, 730-767.

Gibson, Edward & Ken Wexler. 1994. Triggers. *Linguistic Inquiry* 25(3): 407-454.

Haan, Ger de. 1987. A theory-bound approach to the acquisition of verb placement in Dutch. In Haan, Ger J. de & Wim Zonneveld (eds.), *Formal Parameters of Generative Grammar* III, 15-30.

Hart, Betty & Todd Risley. 1995. *Meaningful Differences in the Everyday Experience of Young American Children*. Baltimore: Paul H. Brookes.

Hauser, Marc D., Noam Chomsky & Tecumseh W. Fitch. 2002. The faculty of language: What is it, who has it, and how did it evolve? *Science* 198, 1569-

1579.
Jakobson, Ramon. 1942. *Kindersprache, Aphasie und Allgemeine Lautgesätze*. Uppsala: Uppsala Universitets Årsskrift.
Kampen, Jacqueline van. 1997. *First Steps in Wh-movement*. Delft: Eburon.
Kampen, Jacqueline van. 2001. Review article of Becker 'The Development of the Copula in Child English'. *GLOT International* 7(5), 10 pages.
Kampen, Jacqueline van. 2005. Language-specific bootstraps for UG categories. *International Journal of Bilingualism* 9(2), 253-277.
Kampen, Jacqueline van. 2006a. Early operators and late topic-drop/pro-drop. In Torrens, Vincent & Linda Escobar (eds.), *The Acquisition of Romance Languages*. Amsterdam/ Philadelphia: John Benjamins, 203-227.
Kampen, Jacqueline van. 2006b. The acquisition of the standard EPP in Dutch and French. In Costa, Joao & Maria Cristina Figueiredo Silva (eds.), *Studies on Agreement*. Amsterdam/ Philadelphia: John Benjamins, 99-119.
Kampen, Jacqueline van. 2008. The learnability of A-bar chains. In Everaert, Martin, Tom Lentz, Hannah de Mulder, Øystein Nilsen & Arjen Zondervan (eds.), *Theoretical Validity and Psychological Reality* Amsterdam/ Philadelphia: John Benjamins, @-@.
Kampen, Jacqueline van. To appear. Typological guidance in the acquisition of V2 Dutch. In Jouitteau, Mélanie (ed.), Special Issue on V1/V2 languages in *Lingua*, @-@.
Kampen, Jacqueline van & Arnold E. Evers. 2006. Single value steps in first language acquisition. In Belletti, Adriana et al. (eds.) *Language Acquisition and Development, Proceedings of GALA2005*, 304-318. Cambridge: Cambridge Scholars Press/CSP.
Kampen, Jacqueline van & Arjen Zondervan. 2005. The possessor construction in early child languages. Presentation at the *10th IASCL (International Congress for the Study of Child Language*). Berlin, July 26.
Klima, Edward & Ursula Bellugi. 1966. Syntactic regularities in the speech of children. In Lyons, John & Roger Wales (eds.), *Psycholinguistic Papers*. Edinburgh: University of Edinburgh Press, 183-219.
Krifka, Manfred. 2007. Functional similarities between bimanual coordination and topic/comment structure. In Ishihara, Shinishiro, Michaela Schmitz & Anne Schwartz (eds.), *Working Papers ISIS 8* (*Interdisciplinary Studies in Information Structure*). Postdam: Universitätsverlag Potsdam, 39-59.
Piattelli-Palmarini, Massimo. 2008. Novel tools at the service of old ideas. *Biolinguistics* 2 (2), 237-246.
Pullum, Geoffrey K. 1997. Learnability, hyperlearning, and the poverty of the stimulus. In Johnson, Jan, Matthew L. Juge & Jeri L. Moxley (eds.), *Proceedings of the 22nd Annual Meeting of the Berkeley Linguistics Society (1996): Parasession on Learnability*. Berkeley, CA, 498-513.
Radford, Andrew. 1990. *Syntactic Theory and the Acquisition of English Syntax: The Nature of Early Child Grammars of English*. Oxford: Blackwell.
Rizzi, Luigi. 1990. Speculations on Verb Second. In Joan Mascaró & Marina Nespor (eds), *Grammar in Progress*, Foris, Dordrecht: Foris, 375-386.
Roberts, Ian. 2001. Language achange and learnability. In Bertolo, Stephano (ed.), *Language Acquisition and Learnability*. Cambridge: Cambridge University

Press, 81-126.
Sakas, William G. & Janet D. Fodor. 2001 The structural triggers learner. In Bertolo, Stephano (ed.), *Language Acquisition and Learnability*. Cambridge: Cambridge University Press, 172-233.
Santelmann, Lynn M. 1995. *The acquisition of verb second grammar in child Swedish: Continuity of Universal Grammar in wh-questions, topicalization and verb raising*. Cornell NY: Cornell University dissertation.
Terrace, Herbert S. 1979. Nim. New York: Knopf.
Tomasello, Michael. 2003. *Constructing a Language: A Usage-Based Theory of Language Acquisition*. Cambridge, Mass: Harvard University Press.
Tracy, Rosemary. 1994. Raising questions: Formal and functional aspects of the acquisition of wh-questions in German. In Lattey, Elsa & Rosemary Tracy (eds.), *How Tolerant is Universal Grammar?* Tübingen: Niemeyer, 1-34.
Tracy, Rosemary. 2002. Growing (clausal) roots: all children start out (and may remain) multilingual. *Linguistics* 40(4), 653-686.
Yang, Charles D. 2002. *Knowledge and Learning in Natural Language* Oxford: Oxford University Press.