How a man changed a parameter value
The loss of SOV in Estonian subclauses

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1. Introduction

The loss of SOV in Old English subordinate clauses is one of the most extensively discussed word order changes, and it has been used to argue for quite a diverse range of conceptions of syntactic change (see for example van Kemenade 1987, Koopman 1990, Lightfoot 1991, Pintzuk 1991, Stockwell and Minkova 1991). In this paper I intend to contribute to this debate from a cross-linguistic perspective by analysing the course of a similar change in Estonian, the cause of which is well known — it was initiated in 1912 by an Estonian linguist who intended to purify Estonian from "embarrassing" German influences. Thus, to the extent that the loss of SOV in Estonian subclauses is parallel to the loss of SOV in Old English sub-clauses, this change can shed some light on the theoretical problem of what it takes to set the value for the word order parameter. To do this I will compare the statistical data that are available for the Old English change (see Bean 1983) with similar data that I collected for Estonian. First I will give a short outline of the theory of parametric change as developed, for example, in Lightfoot (1991, 1993) and Clark and Roberts (1993).

2. Theoretical background

The theory of parametric change is an application of Chomsky's theory of generative grammar to diachronic linguistics, and it shares the basic assumptions of generative grammar. First, as grammar exists in the minds of individual speakers, the changes in the speech output of a community are reducible to changes in grammar. Second, as the core grammar is assumed not

to change during a person's lifetime, no substantial change in one's linguistic knowledge is assumed to be possible after the parameters are initially set in childhood. And consequently, most changes involving important linguistic structures (the core language) are expected to take place during the process of language acquisition. This position is clearly expressed by Clark and Roberts (1993: 300): "the logical problem of language change cannot be separated from the logical problem of language acquisition; one of the claims of this article is that the former problem is a subcase of the latter".

Of course, this is an idealisation, and there is hardly a linguist who claims that this is the only way that language changes. Lightfoot (1991) draws a distinction between different types of changes in language. According to him, there can be changes in language that do not affect grammar, and are not brought in by the language acquisition process. "For such . . . changes we have no systematic explanations, and as far as grammarians are concerned, they may as well be attributed to chance" (Lightfoot 1991: 169–170).

It might be debated where the core grammar ends and periphery begins, but the basic word order is certainly determined by the properties of the core grammar. So far there is a general agreement. Thus, the changes affecting the basic word order belong to the class of changes that, according to the theory of parametric change, should take place in the process of language acquisition.

3. The loss of SOV in Old English

Lightfoot (1991) has offered a parameter setting account of the change of SOV to SVO in Old English. On the basis of statistical data collected by Marian Bean (1983) from the *Anglo-Saxon Chronicle* (*ASC*), he has specified the changes in the triggering experience which led the 12th-century English children to set their verb order parameter to SVO instead of SOV.

His account relies on the assumption that children should be able to acquire all the necessary properties of their language from the main clauses plus the COMP of embedded clauses, and thus there is no need for them to take the data from embedded domains into account. He further argues that the evidence from embedded domains is not even available for them in the process of acquisition. He calls this the degree-0 learnability hypothesis ("degree-0" standing for the level of embedding available for learners). As in some languages the main clause word order differs from the word order in embedded clauses (German, for example, has V2 in main clauses, but SOV in subordinate clauses), one

might ask how could children ever acquire such word order patterns, if they do not take the properties of embedded clauses into account?

Lightfoot (1991) proposes a solution to this problem, arguing that there are many indirect clues in main clauses indicating the underlying position of the verb. First, according to X'-theory, heads must be adjacent to their complements at D-structure. Thus, in a V2 language the position of objects can indicate the place where the verb has moved from. Similarly, the non-finite parts of verbal complexes and verbal particles usually do not move with the finite verbs, but remain in their underlying clause-final position. According to Lightfoot (1991), these indicators can be sufficient for learning the underlying SOV structure in V2 languages such as German or Dutch.

As already said, the Old English word order pattern was roughly similar to that of modern German or Dutch. For example, in Alfred's *Orosius* which was written about 900 A.D., 82% of verbs in subordinate clauses are in clause-final position, whereas verbs in main clauses mostly occupy the second position in the clause. However, as Lightfoot (1991) shows, there are still quite remarkable differences between the word order in Old English and that in Dutch or German. First, in Old English co-ordinate sentences, the second clause often shows OV order just as subordinate clauses do. Dutch and German do not allow this. Secondly, in Old English, subordinate clauses sometimes have SVO order which, again, is not grammatical in German or Dutch. And finally, there are also cases of OV order in main clauses in Old English texts. To summarise these differences — there are a number of verb-final main clauses as well as a number of verb-second subordinate clauses in Old English, whereas Dutch and German are fairly consistently V2 in main clauses and SOV in subordinate clauses.

Lightfoot (1991) also argues that there were less reliable main clause triggers for the underlying SOV order in Old English than there are in modern Dutch and German. In Old English, verbal particles did not occur consistently in clause-final position as in German. The negative marker was attached to the verb and moved with it, thus it was unable to indicate the underlying position of the verb. On the other hand, the object–verb order in main clauses provided some additional positive evidence for the underlying verb position which is not available in German or Dutch. According to Bean (1983), OV order in main clauses became increasingly rare during the Old English period — from the total of 50% of the sentences in the first section of the *Anglo-Saxon Chronicle* written before the 9th century, to 22% in the last section, written in the 12th

century. Lightfoot (1991) argues that as children are degree-0 learners, this change in the linguistic environment made the underlying SOV order unlearnable and the relevant parameter was set to SVO. The result of this change in grammar was that the SOV order in subordinate clauses was suddenly changed to SVO in the 12th century.

Obviously, Lightfoot's (1991) results give only the first clue of what it takes to set a verb order parameter, but his arguments can be tested on other languages that have undergone a similar type of change. Estonian is such a language, and in the remainder of the paper I intend to give a comparative analysis of Old English and Estonian data, in the hope of learning something about triggering experiences and the way language changes.

4. The word order patterns in Estonian

At the beginning of this century Estonian embedded clauses showed a consistent verb-final word order while the main clauses were V2. This indicates that Estonian might have had an underlying SOV order at this time. In present-day Estonian, SOV is only a minor word order in embedded clauses. It occurs in a narrow class of sentences where it seems to be fossilised (i.e. in *when*-sentences where the sentence begins with the embedded clause as in (1)). Occasionally verb-final order is found also in other contexts.

(1) Kui ma viimaks oma tee sain, ei tahtnud ma seda enam
when I finally my tea got not wanted I it anymore
'When I finally got the tea, I didn't want it anymore'

Present-day Estonian is a so-called free word order language, where it is hard to determine the basic word order. The main clauses are firmly V2, the most frequent word order in embedded clauses is SVO, then comes V2 (other than SVO) and only then OV order. Most of the V2 orders in embedded clauses are instances of impersonal clauses which have no grammatical or semantic subject. Impersonal clauses are fairly frequent in Estonian, making up about 25% of all clauses (at least that many impersonal clauses were present in my 1940 sample). In such sentences the word order is very variable. For example, an Estonian impersonal clause may have as many as 24 modifications.

Of course, not all of the 24 are equally likely in neutral contexts, but even those that are (see (2)) are so diverse that it makes it impossible for us to decide on this basis for either OV or VO underlying order. As SVO is the most

frequent in embedded clauses, it is very likely that the underlying verb order parameter is set to SVO in present-day Estonian. In any case, the word order of present-day Estonian does not differ much from the word order of Estonian in 1940, which will be discussed in detail later.

(2) Ma pole iial väitnud, et taevas nähti tihti tähti
taevas nähti tähti tihti
taevas tihti nähti tähti
taevas tihti tähti nähti
taevas tähti nähti tihti
taevas tähti tihti nähti
tähti taevas nähti tihti
I be&NEG never said that stars&PART sky+ILL see+IMPR often
'I have never said that stars were often seen in the sky'

All this indicates that Estonian might have undergone a basic word order change in this century. It is known that Johannes Aavik, an Estonian linguist who launched an extensive language renewal campaign in 1912, had as one of his goals to replace verb lateness in embedded clauses with other verb orders (for his other innovations see Tauli 1983). The reason for this was that verb lateness was considered an embarrassing German influence. Thanks to his tireless efforts and a general patriotic attitude in Estonia at that time, verb lateness was all but lost in about 20 years.

As Aavik launched his language renewal campaign in 1912, I carried out a statistical study of Estonian word order in the first half of this century, and compared the loss of SOV in Estonian with the similar change in Old English.

As there are no samples of spoken language available for early 20th-century Estonian, the data were collected from newspaper texts which most resembled the informal spoken language. The body of data consists of 6 samples collected from the newspapers of 1905, 1912, 1919, 1926, 1933 and 1940. Each sample contains 600 clauses. The material was collected from random issues of newspapers from the years mentioned. Only reviews, news and problem articles were used. Each clause was analysed for the clause type, surface verb position, word order and for indicators of underlying OV order. The classification used was close to that used in Bean (1983). Thus, I specified four clause types: main clause, relative clause, subordinate clause, and subjectless clause (includes subjectless conjunct clauses and impersonal main clauses), four possible verb positions (V1, V2, V3, and VF), and three possible indicators for

underlying OV order (other than the finite VF order): the position of verbal particles, constructions with infinitives and non-finite parts of verbal complexes. Some examples of them are given in (3):

(3) Infinitives:

O V
Mees tahtis noa võtta
man wanted knife to take
'The man wanted to take the knife'

V O
Mees tahtis võtta noa
man wanted to take knife

Verbal particles:

O V
Mees murdis$_i$ oma jala ära t$_i$
man broke his leg up
'The man broke his leg'

V O
Mees murdis oma jala
man broke his leg

Verbal complexes:

O V
Mees on oma jala murdnud
man has his leg broken
'The man has broken his leg'

V O
Mees on murdnud oma jala
man has broken his leg

The types of verb order were defined as in Bean (1983) to make the comparison possible. With respect to the verb order, the only important difference between Old English and Estonian is that Estonian has impersonal clauses which do not occur in Bean's (1983) classification. In my database, the impersonal main clauses are included with the class of subjectless conjoint clauses, since they both are independent and lack grammatical subjects. Embedded impersonal clauses are classified either as relative or subordinate clauses, as appropriate. Considering the word order types, the classificatory problems of impersonal clauses are even smaller. As impersonal sentences lack subjects, their word order patterns are close to the word order types in subjectless sentences. So, I have used the classification of Bean (1983) except that I have not tried to guess the position of the missing subject in subjectless sentences — for impersonal sentences it is simply impossible and for sentences where the subject has been dropped, it is hard to guess the position where it might have occurred. In other respects Bean's (1983) classification is suitable for Estonian and is taken over directly. As her classification is too precise for the present purposes, I have grouped the classes into three types: OV, VO and ambiguous. The categories are presented in (4).

In (4), X symbolises verb objects, X' other verb complements. There are two classes (OSV and OVS) where the object is symbolised by O. The distinction between X and O is unnecessary for our purposes here, but as it was needed in Bean's (1983) study of Old English, I did not change it. All these classes as well as the three general types represent surface word order patterns.

(4)

OV type	*VO type*	*Ambiguous type*
SXV	SVX	X'VS
OSV	VSX	X'SV
OVS	SX'VX	X'V
SV_1XV_2	X'SVX	VX'
XV	VX	
V_1XV_2	X'VX	
XV_1XV_2		

5. The dynamics of word order patterns from 1905–1940

Looking at the surface word order patterns, it can be seen that the four clause types are represented fairly consistently throughout the whole period from 1905 to 1940: main clauses form about 40% of all clauses, subjectless main clauses about 20%, relative clauses about 15% and subordinate clauses about 25%. Comparing this with the data from Bean (1983) it appears that her samples of Old English have a slightly higher number of main clauses than the Estonian ones. This is probably caused by stylistic reasons or differences between the text types that the data were collected from.

If we look at the verb position in Estonian main clauses, we can see a typical picture for V2 languages. As the verb position in main clauses and subjectless main clauses is not significantly different, I have grouped them together. The data for both types of main clauses are shown in Table 1.

Table 1. Verb position in Estonian main clauses

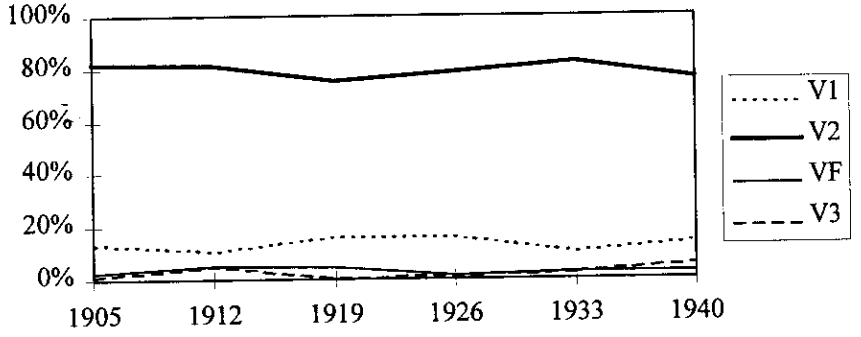
Raw numbers

	1905	1912	1919	1926	1933	1940
V1	48	41	60	59	42	52
V2	292	298	278	283	322	280
VF	9	19	17	5	11	9
V0	5	8	11	9	5	5
V3	4	2	2	4	11	22

Percentages

	1905	1912	1919	1926	1933	1940
V1	13.4	11.1	16.3	16.4	10.7	14.1
V2	81.5	81.0	75.5	78.6	82.3	76.1
VF	2.5	5.2	4.6	1.4	2.8	2.4
V0	1.4	2.2	3.0	2.5	1.3	1.3
V3	1.1	0.5	0.5	1.1	2.8	6.0

Figure 1. Verb position in Estonian main clauses



As Table 1 and Figure 1 show, the dominant verb position in main clauses and subjectless clauses is V2. This remains so throughout the whole period. The other verb positions are quite minor, except V1 which occurs mainly in subjectless conjoint sentences. The verb-final word order is marginal in both types of main clauses, but on the other hand it is diachronically quite stable. This is also the most significant difference between Old English and Estonian — Old English shows a significant number of verb-final main clauses, and what is even more important from our point of view, the VF word order declines steadily throughout the whole period of Old English. To illustrate this, I present a graph from Lightfoot (1991: 66) showing the percentage of main clause OV order in 9 sections of the *Anglo-Saxon Chronicle* (see Figure 2). As you can see, in the first sections it is as high as 50%, decreasing in later sections to 20%. Here, however, one must be cautious because the first four sections of the Chronicle, which cover the period up to 891, might actually have been written later than the events they describe.

If we now consider the verb position in Estonian embedded clauses, quite significant changes appear to have occurred, as shown in Table 2. From 1905 to 1912, the verb-final word order occurs more than 80% of the time. From then onwards, its frequency declines considerably, levelling off around 17% from 1933 onwards. As Table 2 and Figure 3 show, the verb-final order is replaced by orders where the verb is either in the second or third position.

Figure 2. The dynamics of main clause V-final order in the Anglo-Saxon Chronicle *(taken from Lightfoot 1991: 66)*

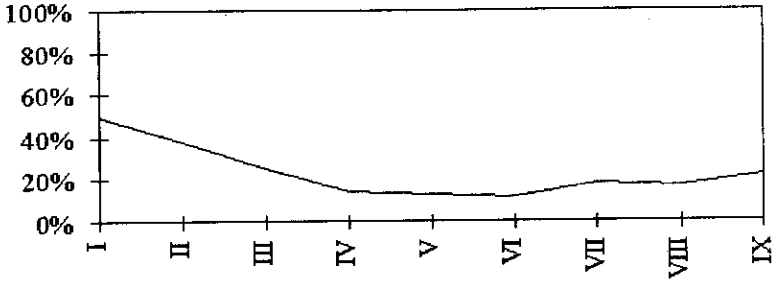


Table 2. Verb position in Estonian embedded clauses

Raw numbers

	1905	1912	1919	1926	1933	1940
V2	14	26	52	87	136	152
VF	226	199	165	133	37	40
V3	4	10	14	10	33	25
V1	6	3	2	9	6	21
V0	3	2	9	8	7	4

Percentages

	1905	1912	1919	1926	1933	1940
V2	5.5	10.8	21.5	35.2	62.1	62.8
VF	89.3	82.9	68.2	53.8	16.9	16.5
V3	1.6	4.2	5.8	4.0	15.1	10.3
V1	2.4	1.2	0.8	3.7	2.7	8.7
V0	1.2	0.8	3.7	3.2	3.2	1.7

Figure 3. Verb position in Estonian embedded clauses

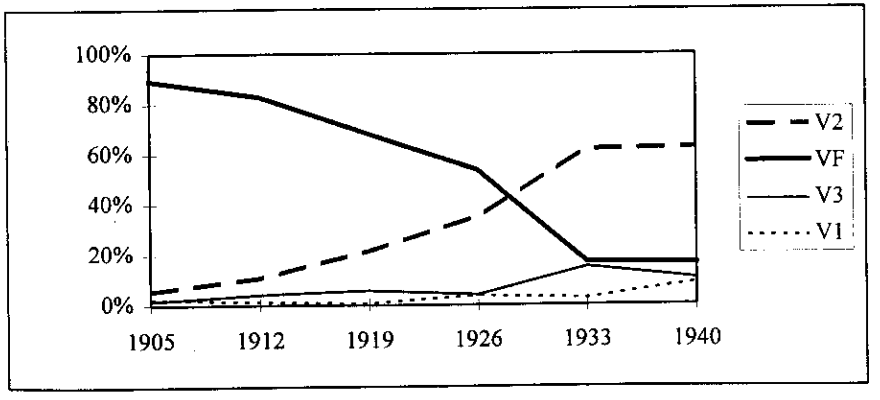


Table 3. Word order types in Estonian relative clauses

	1905	1912	1919	1926	1933	1940
SXV	53	55	31	28	9	5
XV	20	8	14	18	2	12
OSV	7	3	2	1	1	2
SVX	1	3	6	12	23	24
X'SVX	0	0	0	6	3	4
SX'VX	0	0	0	0	15	10
X'VX	0	0	0	7	6	12
X'V	3	2	2	4	0	2
X'SV	12	7	6	8	3	6
X'VS	0	0	0	8	9	9
Total	96	78	61	92	71	86

Thus, looking at these data, it is clear that Johannes Aavik succeeded in removing the verb from the final position in Estonian embedded sentences to some other place, but to what extent is it possible to speak of the change of the underlying word order? Let us compare the Estonian data with Old English.

If we aggregate the figures for OV types and VO types, we see that in 1905, OV order was used about 83% of the time in relative clauses while VO order was used in about 1% of instances (see Table 4). In 1940 OV order was used 22% of the time while VO was used 58% of the time. The respective data for Old English are: an average of 65% for OV and 33% for VO in the first seven sections of the *ASC* and an average of 21% for OV and 58% for VO in the last two sections (Bean 1983). The averages which are presented in Table 5, match quite closely except that Estonian seems to be more strongly SOV in 1905 than Old English in the first seven sections of the *ASC*.

Table 4. Verb order in Estonian relative clauses

	1905	1912	1919	1926	1933	1940
OV order	83.3%	84.6%	77.0%	51.1%	16.9%	22.1%
VO order	1.0%	3.8%	9.8%	27.2%	66.2%	58.1%
Ambiguous	15.6%	11.5%	13.1%	21.7%	16.9%	19.8%

Table 5. Verb order in Estonian and Old English relative clauses

	OV	VO
Est 1905	83%	1%
ASC I – VII	65%	33%
Est 1940	22%	58%
ASC VIII – IX	21%	58%

However, we have to remember that the Old English samples are very small and the data show a significant amount of variation across different sections of the *ASC*. This obviously makes the comparison less reliable. Let us look now at the word order in subordinate clauses (Table 6).

Table 6. Word order in Estonian subordinate clauses

	1905	1912	1919	1926	1933	1940
SXV	73	65	58	42	8	7
XV	31	27	22	18	10	14
SV_1XV_2	2	2	2	11	8	5
SVX	3	9	27	22	43	50
SX'VX	3	7	9	2	12	7
X'VX	0	0	0	9	23	17
X'SV	23	19	18	11	5	4
X'V	6	8	4	7	0	0
VX	4	2	1	5	6	14
X'VS	2	6	10	18	19	24
Total	147	145	151	145	134	142

Table 6 shows the word order for Estonian subordinate clauses. The first three types indicate OV order, the next three VO order and the rest are ambiguous as to the verb–object order. In 1905, OV order occurred 72% of the time and VO 4%. In 1940, instances of OV had decreased to 18.3% whereas VO had increased to 43% (see Table 7). The first seven sections of the *ASC* show an average of 53.5% of OV order and 46.5% of VO order, the last two sections an average of 13% of OV and 65% of VO as in Table 8.

Table 7. Verb order in Estonian subordinate clauses

	1905	1912	1919	1926	1933	1940
OV order	72.1%	64.8%	54.3%	49.0%	19.4%	18.3%
VO order	4.1%	11.1%	23.8%	22.7%	58.2%	52.1%
Ambiguous	23.8%	24.1%	21.9%	28.3%	22.4%	29.6%

Table 8. Verb order in Estonian and Old English subordinate clauses

	OV	VO
Est 1905	72%	4%
ASC I –VII	53.5%	46.5%
Est 1940	18.3%	43%
ASC VII – IX	13%	65%

Generally, this means that while Old English has been less consistently SOV in subordinate clauses before the rapid loss of its underlying SOV, it has changed more clearly to SVO. Estonian was very firmly SOV at the beginning of this century, but the loss of SOV has not been so complete in subordinate clauses as in Old English. However, the dominance of VO order over OV in Estonian embedded clauses in 1940 is large enough to justify an underlying SVO analysis for Estonian.

On the other hand, according to the degree-0 learnability hypothesis (Lightfoot 1991), children do not take the information from embedded sentences into account when setting the parameters, but they recover the underlying verb order in V2 languages using unembedded indicators that signal the place from where the verb has moved. As Aavik's task was to change the verb-final word order in embedded clauses, not the underlying verb order — a concept he could not be familiar with — he did not pay attention to the unembedded indicators of the underlying verb position. Thus, his change of the Estonian embedded clause word order might still not reflect a new setting of the verb-order parameter if the unembedded indicators of SOV remained unchanged. This hypothesis can be tested.

Lightfoot (1991) distinguishes three unembedded indicators that might be left behind when the finite verb moves to COMP: verb particles, negative markers and non-finite parts of verbal complexes (see (2)). In addition, infinitives inside main clauses do not move and have therefore their objects at

the same side where they are base-generated. And finally, the underlying order may manifest itself directly in some main clauses.

In Estonian, as negative markers always move with verbs, only four unembedded indicators remain: verb-final word order (VF), non-finite parts of verbal complexes (V'F), infinitives (IF) and verbal particles (PF). The number of occurrences of these indicators, and the percentage of all unembedded OV indicators in main clauses is given in Tables 9 and 10.

Table 9. Occurrences of unembedded OV indicators

	1905	1912	1919	1926	1933	1940
VF	9	19	17	5	11	9
V'F	32	56	45	24	7	10
IF	51	34	39	22	12	17
PF	11	20	7	6	3	3

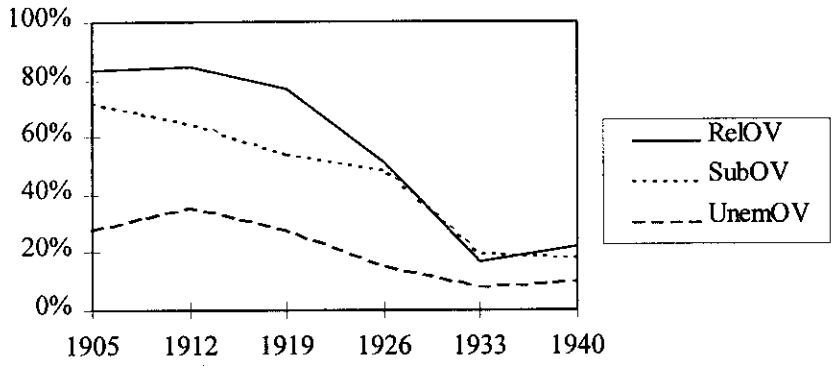
Table 10. Percentage of unembedded OV indicators

	1905	1912	1919	1926	1933	1940
OV	27.9	35.5	28.0	15.4	8.4	10.3

According to Lightfoot (1991), none but the surface OV order was a reliable indicator for the underlying verb order in Old English. As this feature became less frequent during the Old English period (see Figure 2) children could not identify the OV underlying word order and set the parameter value to VO. When this happened, the verb-final word order in embedded clauses was changed rapidly to SVO.

Differently from Old English, where the fall of the frequency of unembedded OV indicators preceded, and according to Lightfoot (1991) also triggered the fall of OV order in embedded domains, the fall of OV in Estonian relative clauses (RelOV), subordinate clauses (SubOV) and unembedded clauses (UnemOV) proceeded in a quite different manner. The dynamics of these three features is presented in Figure 4.

Figure 4. The fall of OV in Estonian clause types



What is most striking in this picture, is that the unembedded indicators for OV have declined together with the verb lateness in embedded clauses. In fact, the dynamics of all these changes shows a very strong correlation: the correlation coefficient between the loss of verb lateness in embedded clauses and the loss of OV indicators in main clauses is 0.91. (The correlation coefficient is a statistical tool which is used to measure the strength of correlation between parameters. It can have values between 0 and 1. The higher the value, the stronger the correlation between the parameters compared.) The fact that the embedded clause word order change initiated by Aavik affected also the unembedded indicators of the underlying OV order, strongly suggests that Aavik's change was not a simple surface reorganisation of constituents. Thus, while Aavik was fighting against the verb-final order in embedded clauses, he actually managed to induce a basic verb order change in Estonian, or to put it metaphorically, he set the verb order parameter to a new value.

Besides empirical evidence for the view that language change is not a subcase of language acquisition, but a phenomenon which, particularly in the cases of rapid change, has to involve the whole speech community, this change also provides a theoretical argument in favour of this position. Provided that the grammar is a set of principles and parameters, the replacement of SOV with SVO in Estonian strongly suggests that adult speakers are able to change the parameter values in their grammar. If this is the case, the impact of the initial parameter setting during acquisition could not be as decisive for language change as modelled in the theory of parametric change. As the parameters need not be fixed in the process of language acquisition once and for all, they could

flexibly be reswitched at any point during the acquisition if they seem not to be in accord with the linguistic input of the learner. I believe this works in a similar manner to the acquisition of morphology (see, for example Plunkett and Marchman 1993): the first morphological patterns are acquired by rote learning, then a broad rule is formulated which starts to produce overgeneralisation errors. When the child realises that, compared to the other people around him, his rule is formulated too broadly, he narrows it down to the correct set of items. And as this scenario works for morphological rules, I cannot see any reason why it should not work for syntactic ones: even if the child might initially overgeneralise the surface VO strings in main clauses and set the parameter value to SVO, when he later starts to distinguish between main clauses and embedded clauses, and learns that other people use a different word order in different clause types, he might well correct his initial hypothesis about the parameter value. To summarise: if adult speakers can change the parameter values in their grammars, as the case of Estonian suggests, then children could do it in the process of acquisition as well. If children can do it, language change is not caused by irreversible language learning mistakes.

6. Conclusion

As this study and some of my previous studies (Ehala 1994, 1995) have shown, language change, particularly a rapid change, cannot be a kind of a clash between generations, but it has to involve the whole speech community. And given that the parameter values can be changed at any time during one's lifetime, as Aavik's success in changing Estonian word order seems to show, there is no reason to consider all instances of language change as a subcase of language acquisition.

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