The role of input in the acquisition of past verb forms in English and Dutch: evidence from a bilingual child.

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1. Introduction

Dutch and English often express past time reference by means of verb forms. As such, there exists a grammaticalized meaning-form relationship in both languages as far as past time reference is concerned. Furthermore, Dutch and English past verb phrases (VP's) exhibit strong structural similarities: the past VP's most commonly used in informal conversation in both languages, namely the simple past and present perfect forms, are more similar in form than that they are different. Finally, both Dutch- and English-speaking adults make use of simple past and present perfect forms in speaking to young children and thus provide children with appropriate learning opportunities.

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Given the fact that monolingual Dutch- and English-speaking children are confronted with formally very similar structural possibilities to express basically the same semantic notion one might expect young children acquiring Dutch and English to take similar acquisitional paths as far as the use of past VP's is concerned. Surprisingly, this does not appear to be the case: preschoolers acquiring American English as their only language typically start out using the simple past when referring to anteriority by means of verbs (Brown 1973, Gathercole 1986), whereas from very early on Dutch-speaking monolingual children use the Dutch present perfect for this purpose (Schaerlaekens and Gillis 1987).

These cross-linguistically different routes in acquisition cannot easily be explained by reference to comparative differences or similarities in the structural complexity of the forms under consideration: in both Dutch and English, the single-unit simple past can be seen as being less structurally complex than the dual-unit present perfect. Yet Dutch-speaking children start out with the dual-unit form that is arguably more complex than the single-unit form.

The interpretative problem is not aided by the fact that the cross-linguistically different routes in acquisition observed here might be due to non-language related differences between Dutch- and English-speaking monolingual children that cannot be controlled for, such as level of cognitive and psychosocial development, cultural background, and the like.

The primary goal of cross-linguistic research is to help rule out undue influence from one specific language-in-acquisition on explanations of the acquisition process in general (cf. Slobin 1985). An obvious concomitant of this goal is that to the extent possible, 'language exposed to' should be the only dependent variable. Monolingual populations acquiring different languages often differ on many more dimensions than just the languages they are exposed to. This makes it methodologically difficult to isolate the precise role of the variable 'language exposed to': in cross-linguistic comparisons of monolingual children, any observed differences or similarities in the acquisition of two languages may not necessarily be due to factors relating only to the acquisition of these languages, but possibly also to non-language related differences between the two populations.

Rather than comparing two monolingual groups with each other, cross-linguistic research can perhaps be carried out more profitably using children who have been simultaneously exposed to two languages from birth. These children, after all, form their own ideal matched pair, since all their language-independent characteristics are identical regardless of what language is being used. Using simultaneously bilingual children who have been regularly and frequently exposed to two languages from birth up to the time of investigation permits a more solid basis for studying the relative importance in the acquisition process of factors such as input, cognitive style, and linguistic complexity.

This paper presents a cross-linguistic study of the early use of past VP's in Dutch and English by an ideal matched pair, i.e., by a child simultaneously exposed to standard Dutch and American English from birth. It will be shown that this bilingual child, Kate, combines within her the acquisition patterns found for English- and Dutch-speaking monolingual children. In the search for possible explanations of this state of affairs an analysis of some characteristics of the input provided to Kate proves to be especially instructive.

2. Simple Past and Present Perfect in Dutch and English: Some Structural Characteristics

Dutch and English use basically two kinds of verb forms to refer to past events: one that consists of a single lexical item, the simple past (e.g. Dutch ZONG/English SANG), and one that consists of a finite auxiliary in the present and a past participle, i.e., the present perfect (e.g. Dutch HEB GEDANST/English HAVE DANCED).

In both languages, the exact shape of the simple past and the past participle in the present perfect depends on the type of verb that is being used, i.e., a lexical verb, a modal or the copula (since past modals hardly ever featured in the corpus analyzed in this paper they will be left out of consideration). Within the class of lexical verbs, both languages distinguish between regular and irregular verbs. Irregular simple past and past participle formation shows similar patternings in both languages in that various 'schemas' (Bybee and Slobin 1982) involving vowel changes can be identified that lie at the root of particular forms. Regular simple past and past participle formation is quite similar across the two languages, except that the Dutch past participle contains both a prefix GE- and a suffix -D (note that the prefix is not present when the verb stem begins with a syllable that looks like a prefix, such as VER-, BE- and the like), whereas the English past participle does not have any prefix.

Dutch and English differ to the extent that English uses a single lexical item for the simple past only in the affirmative: English past negatives and interrogatives are formed using DID in combination with the base or infinitive form. Dutch simple pasts always consist of a single form regardless of mood. Another structural difference is that in the present perfect, Dutch uses one of two auxiliaries, HEBBEN or ZIJN, whereas English always uses HAVE.

Using stability of form across moods, number of words and morphemes needed for a form, and, related to this, length as criteria for determining levels of structural complexity, the Dutch simple past would appear to be the least complex, with the English simple past in second place, the English present perfect in third place, and the Dutch present perfect in fourth place as the most complex.

3. A Bilingual Child's Early Use of Dutch and English VP's to Refer to the Past

The data presented below are based on a corpus of utterances produced by Kate, a girl simultaneously exposed to standard Dutch and American English from birth. Kate was studied between the ages of 2;7 and 3;4. Spontaneous interactions between Kate, either of her parents and/or the investigator were audio-recorded in the home and subsequently transcribed. A comprehensive morphosyntactic analysis of the data including an analysis of language-alternation in the corpus can be found in De Houwer (1990). The data have been made available through CHILDES (MacWhinney and Snow 1990, MacWhinney 1991).

For the analysis of Kate's use of past VP's all utterances containing a verb were extracted from the corpus. Using contextual clues, all utterances with a verb clearly referring to a past event, state or action were then isolated. The verbs in these utterances were then classified in terms of their morphological form. It should be noted that nearly all utterances in the corpus that contained a verb to refer to the past in effect used a past VP, i.e., a simple past, present perfect, past perfect or past continuous form. There was only one exception to this, viz. an English utterance with a verb in it that clearly referred to the past while the verb inappropriately appeared in the base or infinitive form.

Table 1 shows which and how many past verb forms Kate used in English and Dutch. It so happens that over the 8-month period of observation Kate produced nearly the same token number of past VP's in both languages. The distribution of the various forms, however, is quite distinct for each language: English simple past forms of lexical verbs appear with virtually the same frequency (44) as Dutch present perfects of lexical verbs (43). Dutch simple past forms of lexical verbs appear very infrequently, and English present perfect forms are entirely absent. The simple past copula appears with virtually the identical frequency in English and Dutch. For lexical verbs, then, the picture is the reverse in the two languages, with the present perfect as the preferred form to refer to anteriority in Dutch, and the simple past as virtually the only form to refer to anteriority in English. In both languages, past VP's that are not in the present perfect or simple past form occur very infrequently indeed.

Table 1. *Kate's past verb forms*

	DUTCH	ENGLISH
present perfect lexical verb	43	-
simple past lexical verb	5	30
DID + base form	-	14
simple past copula	14	12
past continuous/perfect	1	6
TOTAL	63	62

It is crucial to establish that as was found for all the other morphosyntactic categories investigated in the Kate corpus, there is no sign of any 'amalgamation' of the two language systems for the expression of anteriority by means of verb forms (cf. the analyses in De Houwer 1990). As such, there is no application of form elements from one language to the other, and no sign of any comparison procedures across languages in the sense that a formally more complex form in one language might be avoided in favor of a related, but formally less complex form in the other. In effect, there is overwhelming evidence at all levels of morphosyntactic functioning for what I have termed the Separate Development Hypothesis, which states that under regular and frequent bilingual exposure conditions, early morphosyntactic development in bilingual first language acquisition proceeds in a language-specific manner, without reference to the other language that is being acquired (De Houwer 1990, 1994). As such, young simultaneously bilingual children look like two monolingual children in one as far as the structural properties of their language use are concerned.

In effect, the past verb forms used by Kate in each of her languages greatly resemble those used by her monolingual peers (cf. De Houwer 1990). Thus, Kate combines within her the cross-linguistically different paths found in monolingual Dutch- and English-speaking children as outlined in the introduction. Since Kate is always at the same level of cognitive and psychosocial development regardless of what language she is using, the different routes that she is taking for Dutch and English past VP's cannot be attributed to factors not directly related to language but must somehow be explicable through factors that do relate to language. One such possible factor, i.e., differential levels of structural complexity, seems not to be applicable in this case. A more viable one might be input frequency.

4. Dutch and English Past VP's in Adult and Child Speech

In order to explore the possibility of an input frequency bias that might help explain the acquisition data, the use of past VP's in the input to Kate was analysed employing a method similar to the one used for Kate's own speech production.

Using a combination of CLAN programs (MacWhinney 1991), all adult utterances addressed to Kate that contained a past VP were isolated. This set of utterances was then divided into English utterances (as produced by Kate's American mother) and Dutch utterances (mostly as produced by the investigator; some of these were also produced by Kate's father). After a basic frequency count, these two data sets were then coded in terms of the type of past VP's they contained.

A first and quite basic finding is that past VP's are used quite regularly in the input in both languages. The frequency counts over time of both Kate's and the adults' past VP's further show that with one exception (English at child age 2;7) the number of adult past VP's present for any observed month is higher than the number of child past VP's (Table 2).

Table 2. *Raw frequencies of past VP's (Kate corpus)*

age Kate	2;7	2;9	2;10	2;11	3;0	3;1	3;2	3;3	totals
English									
child	4	-	8	0	3	41	6	-	62
adult	1	-	26	6	13	117	22	-	185
Dutch									
child	4	4	3	0	2	14	4	32	63
adult	28	12	53	13	8	79	42	76	306

The child data show a very clear developmental picture for both languages in terms of frequency of occurrence: 47 out of 62 English past VP's and 50 out of 63 Dutch past VP's occur after age 3;1 (as observed in De Houwer 1990, the number of past VP's as used by Kate is independent of the total number of utterances for any recording session). Indeed, 78% of all Kate's past VP's occur after age 3;1,0, i.e., more than three quarters of the child's past VP's occur in the final 3 months of an 8-month observation period.

The adult data show a somewhat similar picture (although here of course it is rather odd to speak of 'development'). That picture is rather more clear for English than it is for Dutch, though: 75% of all English adult past VP's vs. only 64% of all Dutch adult past VP's occur after Kate has reached the age of 3;1.

There appears to be some evidence indicating that frequencies of use of past VP's by child and adult are somehow connected to each other (cf. the finding that for both the child and adult corpus the bulk of the past VP's occur after child age 3;1,0). For the English data set it appears that in the time between child ages 2;10 and 3;3, adult and child frequencies of use of past VP's are correlated with each other, but since only 5 out of 8 data points show such a correlation the evidence is not very strong. The Dutch data set shows no correlation between child and adult frequencies of use of past VP's across time. On the whole, then, the frequency of use of a past VP by Kate for any month of observation is not strongly determined by its frequency of use by an adult (nor the other way round!). Thus, whether Kate uses a past VP at all seems to have little to do with the number of past VP's that the adults around her use in talking to her.

In contrast, the frequency distribution of the types of past VP's that adults use with Kate does seem to have a very strong influence on the types of past VP's that Kate ends up producing.

Both simple past and present perfect forms are present in the input in both languages (Table 3). As such, there are learning opportunities for both forms for both English and Dutch (cf. also the very first paragraph of this paper). The distribution of these learning opportunities is quite different across the two languages, though. As is shown in Table 3, lexical verbs referring to the past primarily appear in the present perfect form in the Dutch input, whereas in the English input they primarily appear in the simple past (including the form with DID). Dutch present perfect forms and English simple past forms of lexical verbs each account for ca. 70% of the past VP's used by the adults in each input language. Contrastingly, Dutch simple past forms and English present perfect forms of lexical verbs each account for respectively 10.5 and 8.1% of the past VP's used by the adults in each input language. Thus, the picture is reversed for both languages.

Table 3. *Past verb forms as used in the input (Kate corpus)*

	DUTCH	ENGLISH
present perfect lexical verb	72.2%	8.1%
simple past lexical verb	10.5%	44.9%
DID + base form	-	24.3%
simple past copula	15.4%	15.7%
other	3.6%	7.0%
TOTAL	306	185

Note that the proportional use of the simple past of the copula in the input is the same for both languages. In addition, present perfect and simple past are the primary verb forms used to refer to the past rather than other past VP's.

When Tables 1 and 3 are compared to each other, it is clear that the same cross-linguistic results hold for the child and adult data: (1) English lexical verbs referring to the past occur primarily in the simple past, (2) Dutch lexical verbs referring to the past occur primarily in the present perfect, (3) the proportion of use of the simple past copula is the same across languages, and (4) present perfect and simple past occur much more frequently than other past VP's.

A closer examination of the adult and child data for both languages separately reveals a very strong correlation between the distributions of the various forms between the input and the child data within each language. As Table 4a shows for Dutch, the rank order with which past VP's are used by Kate and the Dutch-speaking adults is the same. Similarly, Table 4b shows that for English the rank order with which past VP's are used by Kate and the English-speaking adult is virtually the same as well. At the same time, the rank orders are quite different for Dutch and English (compare a and b in Table 4).

It is possible that the frequency effects demonstrated in the above comparisons between the Dutch and English child and adult data are not crucially related to different categories of past VP's (simple past vs. present perfect) but rather to the specific lexical realizations of past VP's. In order to explore this possibility a comparative analysis was made of the lexical realizations of English affirmative simple past and Dutch present perfect forms as used by Kate and in the input. Space does not permit the detailed presentation of the results of this analysis [2]. The major finding was that there was relatively little overlap between child and adult lexical realizations of English simple past forms. The same was true for Dutch present perfect forms. As such, there is little reason to assume on the basis of the data available in the transcripts that Kate's use of past VP's in either language is a primarily lexically driven, directly imitative process that by implication leads to the sorts of frequency distributions as shown in Table 4. Rather, the main result still holds, i.e., it is the frequency distributions of the categories 'simple past' and 'present perfect' that are correlatable between child and adult speech.

Table 4. *Past verb forms: child and adult data per language*

	KATE		ADULT	
	raw frequency	*rank*	*raw frequency*	*rank*
a. DUTCH				
present perfect	43	1	221	1
simple past copula	14	2	47	2
simple past lexical verb	5	3	32	3
other	1	4	11	4
TOTAL	63		306	
b. ENGLISH				
simple past lexical verb	30	1	83	1
DID + base form	14	2	45	2

[2] Interested readers may obtain the information directly from the author.

simple past copula	12	3	29	3
present perfect	-	5	15	4
other	6	4	13	5
TOTAL	62		185	

5. Discussion and Conclusion

The central focus in this article has been the search for an explanation of cross-linguistically divergent patterns in the use of Dutch and English past verb phrases by young children. As a methodological decision, data were analysed of a simultaneously bilingual child, thus sharply reducing the number of dependent variables that might help account for particular acquisitional paths observed across monolingual populations.

The cross-linguistic study of a Dutch-English simultaneously bilingual child presented in this paper shows that her use of lexical VP's to refer to the past is quite different for each language. Results of analyses of the past verb forms used in the input show very clear correlations between the frequency distributions in the Dutch input data and the Dutch child data on the one hand, and between those in the English input data and the English child data on the other. The most frequently occurring adult usage patterns are the ones appropriately used by the child.

Taking this a step further, it can be hypothesized that the frequency of occurrence of syntagmatically defined morphosyntactic categories in the input is a strong guiding factor in the child's own use of these categories [3] : no additional explanations besides the child's close attention to frequency characteristics of the input within each language are required here to interpret her language-adequate use of past VP's in Dutch and English [4]. As I have suggested earlier, differences in the formal complexity of the past VP's under consideration cannot serve as an explanation for the acquisition

[3] It is striking that Dutch-speaking children take a very long time to learn irregular past participle formation, whereas the appropriate combination of the auxiliary ZIJN or HEBBEN with particular past participles seems hardly to be an issue. This leads me to suggest that paradigmatic relationships may be less sensitive to frequency characteristics of the input than syntagmatic ones. After all, the discovery of paradigmatic relationships involves the comparison across time of elements that do not occur side by side. Syntagmatic relationships would seem to be more accessible to frequency tagging since they present themselves more clearly as things that belong together.

[4] It is obvious, of course, that in order to be able to use past VP's appropriately, the child must have discovered a link between various past VP forms and their meanings. In this learning process, the role of input frequency might be far less significant.

data, since forms of different complexity occur simultaneously. It could be argued that aspectual factors play an important role in the early use of past VP's in English and Dutch. Whereas it may indeed be possible that aspectual, meaning-based categories play a role as well, the strong influence of input frequency on the forms used by the child makes it doubtful that aspectual categories play a primary, decisive role at the stage of development investigated here. For the areas and age range investigated the data can be adequately explained without having to take into account aspectual categories. Naturally, an additional analysis focusing on aspectual categories might be quite valuable. A major methodological problem for such a cross-linguistic aspectual analysis, however, would be the lack of cross-linguistically valid and useable tools to code aspect in English and Dutch.

Frequency of input has not been a popular explanation for past VP acquisition in child language studies (but see Gathercole's 1986 proposal based on a cross-variety study that for English-speaking children frequency of input plays a major role in the timing and order of acquisition of the present perfect). Lately, however, there have been specific proposals that children's early use of past verb forms is at least to some extent determined by distributional frequencies in the input (Shirai and Andersen 1995, Krasinski 1995). Since frequency tagging as an automatic process has been shown to play a role in many different areas of cognition, including that of language (for an overview, see Hasher and Zacks 1984), it indeed makes sense to suggest that input frequencies could play quite a major role in determining the particular paths that children take in acquiring certain aspects of language. The findings from the present study show that particular distribution frequencies of morphosyntactic categories in the input are an influential factor that can help explain the data where other accounts fail.

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