WHY SMALL CHILDREN CANNOT CHANGE LANGUAGE ON THEIR OWN: SUGGESTIONS FROM THE ENGLISH PAST TENSE

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The striking parallel between children's morpho-phonemic or analogical innovations and the morpho-phonemic changes that can be observed in the history of languages has long been noted. (Hooper 1979 and Andersen 1980 are recent examples). Some linguists have proposed that the explanation for this parallel is that children are responsible for instigating this type of change in language. However, for children's innovations to have a permanent effect on the language, they must be maintained into adulthood. Andersen 1973 hypothesizes that as speakers reach adulthood, they maintain basically the same system established during the language acquisition period, but adapt it to the norm in various ways (e.g. by memorizing exceptions). To the extent that a succeeding generation arrives at a similar internalized grammar, their innovations will seem acceptable to the adult, and the adult norm will gradually change. Under this hypothesis, the reason that children's speech seems to reflect morpho-phonemic change so well is that children are freer to be more creative and to produce more innovations. Thus, adult innovations might bear the same resemblance to historical change as children's innovations do, but adult innovations are much rarer, and certainly less well studied.

This hypothesis can be tested by examining carefully the innovations of children and adults and comparing them with on-going morpho-phonemic changes. We undertook such a comparison using the English past tense, concentrating on the treatment of the irregular verbs. We compared data from three age groups: (1) From 31 pre-school children, aged one and a half to five years, we have spontaneous speech data, and from 20 three-and four-year old children we have the results of an elicitation task; (2) From 15 third-grade children between the ages of eight and a half and ten years we have elicited past tense forms from a sentence completion task; (3) We also elicited innovations in past tense formation from 40 universi-

ty-aged adults. In order to elicit innovations from adults, we had to create conditions of pressure and fatigue. We did this by asking the subjects to listen to a list of 180 verbs, and to supply a past tense for each base form they heard. They were asked to respond as quickly as possible, and the experimenters were urged to put as much pressure for speed on the subjects as possible. This experiment and the other data sources are described in detail in Bybee & Slobin 1981.

Our question is, then, if we compare morpho-phonemic innovations of pre-school children, third-grade children and adults, which of these parallel most closely documented on-going changes in the system? The comparison revealed three areas in which the innovations of all three groups paralleled historical change, and one area in which the pre-school children's innovations reflected universal tendencies while the innovations of the two older groups reflected English-specific tendencies. We begin by describing the three areas in which all three groups parallel on-going changes.

The first point concerns the correlation between the percentage of time a subject regularized a verb (e.g. *weep, weeped*) and the frequency of that verb in discourse. It is well known that in the history of languages, the lexical items that are the most prone to analogical leveling or regularization are the least frequent items. In Hooper 1976*a* it was argued that this fact (established statistically there for the English irregular verbs), points to imperfect learning or child language as the source of this sort of change, since irregular items that are rote learned can only be stable if they are frequent enough to be learned well. This argument, however, may also be extended to adults, since it is possible that in order for adults to maintain an irregular item without regularizing it, the item must continue to be used at a certain level of frequency. Thus we might expect to find all three age groups regularizing the least frequent verbs to a greater extent. This is precisely what our data show. The trend is strongest for the pre-school children. A significant negative rank order correlation (−.67) was found between the number of times the caretakers or adults used the verbs in the spontaneous speech samples and the number of times the verbs were regularized by the children. The regularization made by the older two groups of subjects were correlated with the frequencies of past tense forms according to Kučera and Francis 1967. Negative correlations that were significant or that approach significance were found for four out of the six verb classes that were large enough to test (Bybee & Slobin 1981). These

data show that the same relationship between frequency and regularization exists in speakers of all ages as well as in historical change. Thus it is not just young children's imperfect learning that prompts historical regularization, but rather the general weakness of a low frequency irregular item for speakers of all ages.

The second point of agreement among all three age groups and history concerns the class of verbs which includes *send, sent; bend, bent; lend, lent; spend, spent*; and *build, built*. These verbs form their past tense by changing a final *d* to *t*. All three age groups regularized these verbs more often than the average. This was especially striking for the third-graders, who regularized this class of verbs 53% of the time, while their average of regularizations for verbs of all types was only 17%. The preschoolers regularized this class 57% of the time, compared to an overall average of 39%, and the adults showed a much smaller margin, regularizing this class 20% of the time compared to an overall 17%.

The difficulty with this class of verbs seems to be that it employs a process quite distinct from any other used to form the past tense in English. These verbs neither undergo a vowel change nor add a suffix, but rather devoice a final consonant, which makes them unique in all of English morphology. Furthermore our subjects's difficulty with these verbs reflects an historical trend toward eliminating this class altogether. The following verbs are listed by Jespersen 1942 as belonging to this class:

(1)

bend	blend	
lend	geld	rend
send	gird	shend 'to shame'
spend	gild	
build	wend	

The five verbs in the first column are the viable members of this class. The next five have regularized in American English. Note further that of these five, only *blend* is in common use, the others, including *rend* from the last column are dangerously near passing out of the language, and *shend* already has in American English.

Thus this class of verbs is losing members to the extent that it probably should no longer be considered a class, and our subjects' regularizations of these verbs reflects this movement. Note further that while the usual way for an irregular class to lose members is by regularizations, this class is losing members by lexical attrition. That is, some of the verbs have fallen into disuse while new verbs are substi-

tuted for them. This trend was also observable among our adult subjects, four of whom gave *loaned* as the past tense of *lend*.

The third area of convergence to be discussed concerns the verb classes following the patterns of *sing, sang, sung* and *sting, stung*. Here we are not concerned with regularization errors but rather with errors of incorrect vowel change. Consider now these two related classes of verbs, grouped according to the final consonant:

(2)

m	swim	swam	swum
n	begin	began	begun
	run	ran	run
ng	ring	rang	rung*
	sing	sang	sung
	spring	sprang	sprung
nk	drink	drank	drunk
	shrink	shrank	shrunk
	sink	sank	sunk
	stink	stank	stunk

*not originally an OE strong verb.

(3)

n	spin	spun
	win	won
ng	cling	clung
	fling	flung*
	sling	slung*
	sting	stung*
	string	strung*
	swing	swung
	wring	wrung
	hang	hung*
nk	slink	slunk
k	strike	struck*
	stick	stuck*
	sneak	snuck*
g	dig	dug*
	drag	drug*

*not originally an OE strong verb.

Innovations of incorrect vowel change were not recorded for the pre-school children, so our discussion here involves only the third-grade children and the adults. Our point here will be to demonstrate the convergence of the innovations made by these two

groups with historical innovations.

The third-graders only made 38 innovations of incorrect vowel change, and 32 of them involved these two types of verbs. The adults made 85 such innovations and nearly one half, 41 of them, involved these classes of verbs. It is clear, then, that these are the strong verb classes where the action is in the contemporary language.

The most common type of innovative form was one in which a verb of the *sing, sang* class was treated as though it belonged to the *sting, stung* class. In other words a past tense in /ʌ/ was given. The number of times this occurred is registered in (4).

(4)

		adults	3rd graders
shrink	shrunk	5	9
ring	rung	5	6
swim	swum	5	1
begin	begun	2	2
drink	drunk	2	6
sink	sunk	7	*

*Not on 3rd graders test.
(For the adults, these are out of a total of 20 responses; for the 3rd graders, out of 15 responses.)

These responses parallel the historical trend which is to eliminate the distinction between the past tense form and the past participle form, in favor of the past participle form. This is precisely how the *sting, stung* class was formed originally: all the strong verbs in this class originally had three principle parts, e.g. *spring, sprang, sprung; spin, span, spun*. Thus the non-standard forms that adults use under pressure are the same as the non-standard forms the third-graders use, and the same forms that we would predict would come into use if past trends continue. Once again, the adult innovations converge with historical trends, much as children's forms do.

A second type of innovation involving the *sting, stung* class that parallels historical trends is the attraction of new members to this class. All the forms asterisked in (3), (10 out of 16) have been brought into this class since the Old English period. This is clearly the most productive of strong verb classes. We are not surprised that our subjects also added new members to this class by producing the forms in (5).

(5)

		adults	3rd graders
bring	brung	1	2
think	thunk	0	1
clink	clunk	1	*
streak	struck	4	*
eat	ut	0	1

*Not on 3rd graders' test

Again, the trend evidenced in these responses parallels neatly the long-standing historical trend.

Our subjects also produced some counter-historical innovations. In these they treated verbs of the *sting, stung* class as though they belonged to the *sing, sang* class, and gave them past tenses in /æ/. They also treated one weak verb *clink* as though it were a member of the *ring, rang* class. Consider the examples in (6):

(6)

		adults	3rd graders
string	strang	2	1
sting	stang	2	1
slink	slank	1	*
clink	clank	1	*
	clanked	3	

*Not on 3rd graders' test

Parallel historical innovations have not occurred, except in the case of *ring, rang, rung* which was originally weak (Jespersen 1942). In accord with the historical trend, such innovations are much rarer in our data than the innovations that lead to new members of the *sting stung* class.

The three points just mentioned, then, are the major trends identifiable across all three age groups, and these are precisely the trends that are parelleled in the ongoing changes in American English. It seems reasonable to conclude, then, that young children are not the only, and perhaps not the primary instigators and perpetrators of morpho-phonemic change. Stronger evidence for this point come from innovation in verbs with a zero past tense suffix, e.g. *cut, hit, set*, where the older children and adults seem to reflect ongoing changes in the system better than the younger, pre-school children do. We turn now to a discussion of these verbs.

When we compared the percentage of regularizations on verbs that take a zero-suffix, i.e. the *hit* class, across age groups, we find a striking anomaly: while the percentage of regularizations overall

drops dramatically between pre-school children and third-graders, the percentage of regularizations on the *hit*-class remains virtually the same across age groups. The result is that for pre-schoolers the regularizations in this class are *below* their overall average, i.e. 29% for the *hit*-class versus 39% overall, but for the third-graders and adults, the regularizations in the class are *above* average, 27% compared to 17% overall for both groups. The question is, then, why do subjects get *worse* at dealing with this type of verb rather than *better*? The answer we suggest in Bybee & Slobin 1981 is the following. The strategy that the youngest children start with in trying to analyse past tense formation in English, does not involve necessarily the postulation of a suffixation process, but may involve simply the observation that past tense verbs end in an alveolar stop. (Such a generalization is called a *schema*.) Thus they know what the end product must be like, but they have not formulated the suffixation process as a *necessary* means for arriving at the end product. (They have formulated a product-oriented modification, in the terms of Zager 1980). Verbs such as *hit, put* and *cut* already contain the phonetic material necessary for signalling past tense, that is, the final *t*. These youngest children are content that past tense is adequately signalled by this *t* and so are less likely to add a suffix to these verbs than to some others.

The pre-schoolers' strategy reflects a universal tendency, called 'affix-checking' by Menn & MacWhinney (forthcoming) and 'morphological haplology' by Stemberger 1980, to avoid adding affixes to words or stems that appear already to contain these affixes. Indeed, it is no accident that the only verbs in English that are unchanged in the past are verbs that end in *t* and *d*. Examples of similar phenomena in other languages are documented by Menn & MacWhinney (forthcoming) and Stemberger 1980. There is further evidence that it is this strategy that accounts for the pre-schoolers' relative success with these verbs. When Berko 1957 tested children with nonce forms, she found that children preferred to add no past tense suffix to verbs ending in *t* or *d*, and similarly, they preferred to add no plural suffix to nouns ending in a sibilant. The strategy, then, is not limited to verbs. In the pre-school elicitation data we report on in Bybee & Slobin 1981, there is a highly significant tendency *not* to add a suffix even to regular verbs, such as *melt*, that end in *t* or *d*. (For further evidence of this strategy, see Kuczaj 1978).

The third-graders and adults differ from the pre-schoolers in that their major strategy is the suffixation process: rather than operating with the principle that a past tense verb ends in *t* or *d*, they operate with the principle that a past tense form is a base form with *t* of *d added* to it. Thus their tendency is to make many errors of adding *ed* to verbs that should not change in the past tense. This does not mean that the child's strategy is not still operative in adults—it is to a limited extent. Where the third-graders and adults produced past tense forms without changing the base (where a change should have been made), this was more than twice as likely to be with a verb ending in *t* or *d* than with a verb ending in some other segment. But overall the strength of the suffixation process is evident in the relatively high percentage of regularization of verbs of the *hit*-class.

Now compare the history of this class of verbs. They arose quite naturally as the weak preterite suffix *de* assimilated to final *t* to give OE preterites such as *sette* for *settan*. Subsequent final vowel deletion produced identical present *set* and preterite *set*. A class of verbs with primarily lax vowels and final *t* and *d* that undergo no change in the preterite was born. This class has attracted new members from the strong verbs and also from borrowings: e.g. *bid, bust, slit, cost* (Jespersen 1942:28). The class enjoyed a period of productivity that culminated, according to Jespersen, early in the Modern English period. At that point some verbs that were previously unchanging began to regularize, e.g. *fast, start, lift, fret*. The trend seems to be continuing with e.g. *roast* and *sweat* regularizing as well. It appears, then, that though this class has enjoyed some productivity, due perhaps to the universal tendency mentioned above, the regular suffixation process has continued to gain strength and overrides the productivity of this class in current English.

If this sketch of the history of the *hit*-class correctly interprets current trends, then the third-grade children's and the adults' innovations are more in accord with on-going changes in the system that the pre-school children's formations are. While the pre-school children do regularize all verbs, including the *hit*-class, their tendency to regularize these less compared with the older groups' tendency to regularize them more, suggests that the pre-school children's innovations accord more with universal tendencies while the older groups manifest more English-specific tendencies.

The conclusion that must be drawn from the facts is that there is nothing particularly special about the relation between small children's innovative forms and morpho-phonemic change. The innovation of older children and adults, though perhaps rarer, where they can be elicited, may also serve as predictors of change. In fact in some cases where adult innovations differ from early child innovations, such as with the *hit*-class, the adults and older children, who are in better command of the entire system, innovate in ways that manifest more precisely the on-going changes in the system. Thus it appears that both socially and linguistically the older children and adults are in control of morpho-phonemic changes.

This is not to say that the study of early child language is of no interest to historical linguists. Quite the contrary, since it is only in early child language that universal principles or morpho-phonemic organisation are manifested most clearly. Here children not yet under the influence of an internalized language-specific system reveal certain very general operating principles for approaching morpho-phonemics (Slobin 1973, MacWhinney 1978). These universal principles will underly the adult system. The child's task is to sort out how conflicts among principles, and conflicts between principles and input data, are to be resolved. The interplay between conflicting principles places the seeds of change in these universal principles. In the example we have just discussed, the *hit*– class of verbs developed fortuitously by regular sound change, but was stabilized and made productive, because these verbs fit in with the universal principle which allows zero-affixation in case a base already contains the phonetic material of the affix. This principle was previously manifested nowhere else in English. Its source at this point must have been the operating principles of early child language. On the other hand, it conflicts with the operating principle that clear segmentation of markers should be maximized. The current resolution of this conflict is in favor of the latter principle which is realized as a suffixation rule. But the realization that both principles are operative in early child language helps us to understand the changes that have taken place over the centuries in English. Our data suggest, then, that current changes in a language will be better reflected in adult innovations, and that adults are actually responsible for carrying out morpho-phonemic change. Young children, on the other hand, give a better indication of the full range of possible changes and are an important source of information for a theory of morpho-phonemic change.