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THE LINGUISTIC IMPLICATIONS OF EARLY AND SYSTEMATIC VARIATION IN CHILD LANGUAGE DEVELOPMENT

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Introduction

The fact that children learning language may seem to do it in different ways is no longer disputed. But there is still a great deal of argument about the significance of such differences. Inevitably, these arguments are polarised around the nativist-environmentalist debate. Thus nativists regard differences between children as uninteresting to a theory of language development. In their view, there is only one way to break into language and differences between children merely result from the fact that some are slower than others and are inclined to use non-linguistic strategies in verbal interaction until the correct linguistic knowledge develops. On this view there is a radical break between prelanguage and 'real language'. There are two assumptions here, both wrong.

The first is that the learning of language structure can be separated from all other aspects of language learning and the second that structure can only be learned in one way. These two assumptions derive from a view of biological innateness that insists on the invariable unfolding of a single blueprint. In fact there is nothing about a nativist account that makes differences impossible. Quite the reverse. A biologist would expect there to be differences which would allow the system to use environmental variation in a way that buffered against too much variation in outcome. So even in their own terms nativist theorists should be interested in systematic differences and in whether they show continuity through development.

The significance of early variation is that much stronger if it can be shown that these differences affect how the child moves into the next stage of language development. Thus if it can be demonstrated that progress depends on previous developments rather than arising *ab initio* as for instance Gleitman (1981) would argue that it does, this should be of central importance to any psychologically realistic theory of language development. By contrast, the failure to show any continuity from early differences might lead us to conclude that such variation is, indeed, a relatively transitory and uninteresting phenomenon.

As one would expect, environmentalist approaches tend to emphasise continuity between phases of development, most notably when they argue that communicative function underlies both the preverbal and the structural phases of development and that this in some sense explains the

development of structure. Because, in this approach, children are thought to have their communicative development shaped by the structures of interaction with which they engage, this ought to lead to the prediction that early variation is caused by differences in these structures of interaction. However, although differences are often noted in these accounts, only rarely is there any attempt to incorporate them into a theory of development (but see Nelson 1973, 1975, Lieven 1982, Peters 1983, Bates, Bretherton & Snyder 1988), or to relate them to what is known of children's development of language structure.

Thus, for different reasons, most present work on language development, whether underlyingly tending more to empiricist or nativist principles, tends not to incorporate the evidence for different strategies. In this paper, I suggest that a theoretically well-motivated approach to the nature of these strategies, can help us to identify the central, and to some extent, separate aspects of language that children have to master.

Prosody and lexicalisation

There seems to be evidence that children differ very early on in the extent to which they use either prosody or lexicalisation in their attempt to convey meaning (Dore 1974, Peters 1977). Some children appear to make a clear distinction between a babbling phase and the production of one word at a time to convey meaning. Others seem to have abstracted aspects of the sound pattern with which to convey systematic meaning. This has been found for Hungarian (MacWhinney 1985) as well as for English (Ramer 1976) and for second language learning (Wong Fillmore 1979).

At the very least this may signal the separation of these two most fundamental aspects of language: words on the one hand and prosody on the other. Children seem capable of focusing on one or the other in their first attempts to produce systematically meaningful utterances. There is some evidence that this distinction continues to operate at later stages of language development as some children identify slots in a prosodic pattern which they cannot as yet fill while others never appear to use fillers, schwas and reduplication to achieve a meaningful prosodic contour. The use of fillers and schwas by some children and not others has been reported for English (Bloom 1975, Ramer 1976), Turkish (Aksu-Koç & Slobin 1985) and Polish (Smoczyńska 1985). The Turkish example illustrates how this prosodic approach may provide a stepping stone to later development. Aksu-Koç & Slobin report that early on in development children sometimes attempt to retain the rhythmic picture of a complex verb by inserting morphemes which sound like passive or causative particles but are, in fact, meaningless. They point out that this "unmotivated analysis of words into combinable syllables (is) an obvious prerequisite to the discovery of principles of productive morphology" (p.848). The Polish example is very similar.

This Turkish example raises the interesting possibility that the prosodic approach may be of more use to children learning some types of languages than others. For instance a language with regular morphological patterning like Turkish may be much more accessible to such a strategy than would a language like Russian in which the morphology is irregular

and complex (Slobin 1981). However, if both approaches reflect basic processes in the language learning system, we might expect to find that, for each language being learned, at least some children adopting each approach though the relative proportions might vary as a function of the type of language. There is not much additional evidence on this proposal from other languages as yet though Leroy (1975) reports a difference between two children learning French, one of whom used variable word order with intonation apparently acting as a segmentation device, while the other child used much more fixed word order with shorter and phonologically clearer segments (see Clark 1985). Clearly there are some interesting avenues for crosslinguistic investigation here. It is also possible that this difference between prosodic and lexical approaches may be related to differences in the size of 'chunks' that children use as they start to structure their utterances (see below).

Inflections and word order

The two basic methods of expressing semantic relations in a sentence are the use of inflections and the use of word order. We know that, where there is unambiguous evidence in the input language, children can easily and rapidly learn either system, examples being the rapid acquisition of inflectional morphology in Turkish (Aksu-Koç & Slobin 1985) and of basic word ordering in English. We also know that where the input data are unclear or complex in terms of morphology, there is often a tendency to depend on word order until the inflectional morphology is well established. There are two situations in which we might expect to find individual differences in relation to these methods of expressing basic semantic relations. One is where children are exposed to a language in which both word order and inflectional morphology are non-transparent as to how to convey, for instance, basic agent-patient relations. In this situation do all children adopt the same strategy, i.e., does one method take precedence over the other or is there individual variation? The second situation might be where, although the language that the child has to learn is clear enough, s/he is exposed to a somewhat minimal version of it and is left very much to her/his own resources in the learning of the language. Is there any evidence in this situation that children sometimes adopt an inappropriate strategy for the language in question by contrast with children who are exposed to a 'rich' input? Since most of the children whose language development has been studied intensively come from environments which provide a great deal of interactive language, this is a difficult question to answer, but I have argued (Lieven 1984) that children learning to talk in relatively impoverished environments can use a variety of techniques to bootstrap themselves into language and that one should indeed find a wider range of variation in approaches to early language learning if one studies such children.

To go back to the question of whether a language in which both word order and inflectional morphology are relatively opaque will lead children to adopt both strategies, a suggestive but by no means conclusive example is provided by Argoff's (1976) Finnish data. Kai and Tuomas, the two children in this study, differed in the degree to which they used a fixed word order strategy and in their early control over inflectional morphology, particularly with regard to the objects of verbs. Finnish has a complex system

for marking the objects of transitive verbs and it also has a canonical SVO word order which can be varied for pragmatic focus. One child, Kai, used a relatively fixed word order which conformed to that of his input but took a considerable time to develop productive inflections for the object. Tuomas, on the other hand, did not follow the word order patterns of his input so closely but did indeed show earlier productive control of object marking. It is interesting to note that Tuomas did not use canonical word order until later - in other words his inflectional acquisition may have substituted for the use of word order - in this he is perhaps demonstrating an independence of input matching which accords well with Slobin's basic child grammar, although a more detailed study of his input would be necessary to decide this conclusively. If we can accept this example, we have here a demonstration that individual differences between children learning the same language may provide evidence as to the forms and relative strengths of different parts of the language making capacity.

However we do have to be rather cautious in interpreting these data. Firstly it is not clear that both children were hearing the same form of Finnish, since Argoff notes that the Finnish that Kai heard may have been contaminated by Swedish and therefore influenced in the direction of a more rigid word order. A second issue relates to the very small number of examples of each word order and inflection that Argoff managed to obtain. It is difficult, in the absence of data on productivity, to know whether these strategies on the children's part reflect the genuine expression of different approaches to the problem of marking meaning in utterances or whether they are nearer to rote-learned routines or patterns. The only way to answer this question would be a study of Finnish in which a larger number of children was involved and which involved larger samples of both adult input and of child output. The fact that Bowerman (1973) also found differences in the dependence on word order or inflections in the two Finnish children that she studied might encourage some Finnish scholar to follow up this suggestion.

There are no other clear reports of individual differences in word order versus inflectional strategies for production. It seems that, for the languages that have so far been studied, either the language is so clearly dependent on one or the other method (e.g. inflectional marking in Turkish) that there is little encouragement for the child to try an alternative strategy or that the data are so complex that they have so far defeated analysis. Thus Smoczyńska reports that the dependence of Polish children on rigid word order varied a great deal but could not be studied without a detailed study of the role of pragmatic word order in adult Polish and this has not, so far, been undertaken. The fact that children can pick up pragmatic word order from a very early point in their language development is well attested for both Japanese (Clancy 1985) and Turkish (Aksu-Koç & Slobin 1985) acquisition and this will obviously be a confounding factor in any language where word order variation is extensively used for pragmatic purposes.

Another source of data on inflectional versus word order strategies comes from experimental evidence on children's processing of active and passive sentences. Bridges (1979) makes some interesting suggestions about the way in which individual differences in processing strategies may account for some of the anomalies in the results on children's processing of

these sentences and there is a similar point made by Clancy (1985) in relation to studies by Hakuta (1982) and Sano (1977) in Japanese. Both the Japanese studies reported that children differed as to whether they were more dependent in their interpretations of the test sentences on local morphological markers or on word order. It would, of course, be fascinating to know whether such differences reflect acquisitional strategies which were present in the child's earlier development or whether they are specific to this task. If children's acquisitional strategies can be related to their later strategies for processing language, this has potentially far reaching implications for theories of adult language processing.

From the little evidence we have, then, it does appear that children may differ in whether they approach the task of systematically varying meaning by adopting either a word order or an inflectional strategy, provided that the language that they are learning does, in fact, use both methods. If this can be further substantiated, we have a demonstration of how the study of early differences between children can identify some of the separate processes which are involved in learning to talk.

Continuity from single words to structure

We now turn to the question of whether there is evidence that the ways in which children first start to use language conditions how they move into succeeding stages. In an earlier study, I showed that this was clearly the case for three children (Lieven 1980). The children differed radically in how they structured their multi-word utterances despite similar mean lengths of utterance. The major difference was the relative degree of dependence on formulae which were structured around a particular lexical item in a fixed frame (e.g. *more + X*, called a *pivotal formula*) or on formulae the structure of which depended on the use of underlying categories (e.g. *possessor + object possessed*, called a *categorical formula*) (see Table 1).

Table 1

Examples of multiword utterances: Possession

Beth	Jane	Kate
my Daddy	my bables	Lena's tapecorder
my car	my penny	not Kaykay's tapecorder
my shoe	my happy birthday	jam's knife
theres my daddy	there my baby	Gerald's turn
there, that my toy	there my big ones	that Kaykay's
there my two choo-cho	sat my broom car	like Zoe's
there my two more car	that my potty pot	frog's dinner
in there, my Daddy, Mum	theres my wiggly worm	frog's clock

One of the children, Kate, used almost no pivotal formulae and seemed, from the beginning of her production of multi-word utterances, to be structuring them using some kinds of underlying (probably semantic) categories. The other two children, Beth and Jane, relied very much more heavily on pivotal-type formulae, though within this they differed substantially. Jane's utterances covered both a wider and a more specific semantic range, with very few unanalysed phrases being used as part of the utterance. Beth's used a very small number of pivots but combined them with a large number of partially analysed chunks.

It is important to note that both Beth and Jane's utterances were productive in the sense that large numbers of utterances with the same pivot were produced and that many of them were unlikely to have been heard by the children. But the crucial point here is that how these children structured their multi-word utterances can be related to how they used words at an earlier stage.

Thus Kate's early talk about a wide range of objects may have led her into developing categories with which to talk about those objects (e.g. categories of possession, attribution). Beth's most frequently used single words formed the pivots for her multi-word utterances as, to a lesser extent, did Jane's. This seems to be evidence for continuity from the one-word stage into structure.

Starr (1975) also found that emphasis on nouns in the single word stage was associated with a more elaborate set of noun-noun non-pivotal type constructions in multiple word utterances, while her data suggest that the other group of children were more pivotal. And both Bloom, Lightbown and Hood (1975) and Nelson's (1973) findings in their longitudinal studies may be seen as suggesting the same phenomenon.

Both these latter studies suggest that one dimension on which the children's multi-word utterances differed was how dependent they were on pronouns. In the case of the Nelson study this was related to the classification of the children at an earlier stage as either 'referential' (object oriented) or 'social-expressive' (in Nelson's terms, interaction oriented). It seems quite probable that what is really being picked up is the tendency of the so-called 'pronominal' children to depend on pivots rather than the production of large numbers of noun-noun combinations. This would then be more evidence of continuity from a large proportion of nouns in the early single word vocabulary to categorically based multi-word utterances; and of continuity from a much lower dependence on nouns to a more pivotal strategy. Unfortunately none of these studies follows the children's stylistic differences any further and thus we cannot answer the critical question of whether these differences, which certainly suggest that children can move into the production of rule-governed utterances in rather different ways, then condition what they do next. For instance do pivotal children go on to work on the various parts of their pivotal utterances or do they, abandoning their pivots, start to produce multi-word utterances which are identical to those of categorical children. In other words are pivotal children up a blind alley or can they use their pivotal approach in building a more sophisticated grammar? Are they just doing what the categorical children are doing only slower or are they approaching the problem differently?

Two potentially conflicting answers are provided by a study by Bates, Bretherton and Snyder (1988) on the one hand and by the study I am conducting on the other (Lieven, Dresner Barnes & Pine, in preparation). The study by Bates et al. involved collecting data from 27 children on four occasions between 10 and 28 months. Early stylistic differences similar to the ones mentioned above (i.e. a tendency to use object names versus a tendency to use unanalysed units) were found at the earlier ages but in terms of measures of language advance as defined by Bates et al. the more phrasal style seems to predict children who are just slower overall. However, the study does not really address the issue of whether these children are not only slower but also building language itself on a different basis.

The study by Lieven et al., looks in much finer detail at the language of 12 children starting when they are 12 months old (and, ultimately following them to 36 months). The major difference to show up between these children was in the degree to which their very early vocabulary was based on object names as opposed to phrases (independent measures). There was a statistically significant continuity in the production of *either* object names *or* phrases in the acquisition of the earliest 50 and 100 utterances. In addition, there was also evidence of productivity with some of the phrasal children's patterns in the second 50 utterances. Peters (1983) has suggested that children may be able to segment their rote-learned phrases and produce structural patterns from them which show some form of productivity and our study provides preliminary evidence for this (see Table 2).

Table 2				
Examples of structural patterns with limited productivity, produced before the acquisition of a 100-utterance vocabulary				
Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5
(Subject 1)	(Subject 1)	(Subject 2)	(Subject 2)	(Subject 3)
want a yoghurt	I draw	see ball	my bum	itsa boat
want dinner	I got it	see baby	oh look my bike	itsa mouse
want that	I do it	see good girl	and my dummy	itsa miaox
want draw			oh my blanket	itsa nose
want bite				

Thus, there is no question of these children having to amass a large number of open class words before they start to produce multi-word utterances. In addition similar proportions of both the more object naming children and the more phrasal children showed a clear explosion of vocabulary during their early development. This is important because this

vocabulary explosion which is seen in many, but not all, children is usually regarded as evidence of a major breakthrough into language and there is an implicit assumption in the field that only 'referential' children will show it. And, finally, although the full data are not yet in, it seems that these phrasal children go on to generate multi-word utterances which are novel and have a pivot-like structure. I would like to argue that we have here preliminary evidence for a genuinely different, rather than simply slow, route into language.

Data reported by Clancy for Japanese is suggestive of the idea that similar kinds of differences in strategy between children can indeed, have consequences for other aspects of language development. Clancy reports a study by Okubo (1981a) in which two children differed in the single word utterance stage as to whether they were 'noun-dominant' or 'verb-dominant'. These differences had consequences for other acquisitions; thus the 'verb dominant' child acquired features associated with the verb, i.e. verbal inflections and sentence-final particles which typically follow the verb earlier than did the 'noun-dominant' child while he, in turn, though more limited in the predicate position, had more elaborated nominal arguments which included modifiers. Their multi-word utterances also differed in that, although both used pivots, the pivots were different as a function of the child's one word style. The verb-dominant child used her pivots with a large number of predicates and sentence-final particles, while the noun dominant child used his pivots in conjunction with a wide range of nouns. Here then we have a case in which, despite the fact that, at a later stage, these children will no doubt look identical in terms of their basic grammatical control over their language, there do seem to be different routes into at least a part of it. The fact that they end up with a similar grammar does not mean that the different ways by which they arrive at constructing it are uninformative to a theory of language development.

I suspect that differences between categorical and phrasal-pivotal strategies are related to the structural and distributional aspects of language (as argued by Maratsos & Chalkely 1980), in which case obviously both strategies lead on to further development. As I have argued above, children learning a language that uses both word order and inflections for marking basic case relations often start with one or the other. No one would suggest that in this case one strategy was useless or less advanced. The evidence is not yet in but my hunch is that eventually it will be found that the same is true for categorical and pivotal strategies, and that it may be that children can, initially, approach from one or the other direction. There is, of course, the further question of where they go from here, in other words how does the phrasal-pivotal approach develop? We hope that the fact that we are following these children until they are 36 months old will help illuminate this issue. The only evidence that we have in English that suggests a relatively long lasting effect on syntactic acquisition of some of these differences is a study by Horgan (1978, 1981), in which relative 'noun dominance' in the early stages of language development correlated with both speed and style of acquisition of passive constructions. Bates, Bretherton and Snyder (1988) argue that the evidence from their study suggests that there is not this kind of homotypic continuity (i.e. concentration on nouns through a number of stages of development) but that there is heterotypy in that the children with the

more analytic-categorical approach are ahead on measures of linguistic sophistication at all ages. (For a detailed appraisal of this book, see my forthcoming review in the *Journal of Child Language*).

What leads to different strategies?

Assuming that these strategies for the creative production of early multi-word utterances may be generated by the way in which the child uses words at an earlier stage, the question then becomes whether we can find any causes for early differences in vocabulary learning and use; particularly between those children who are clear object namers and those who are clearly phrasal. Part of Nelson's (1973) explanation was that the non object-naming children were more interested in social interaction than were the other group. But this can hardly be true as stated. In my earlier study (Lieven 1980), Kate was just as interested in social interaction as Beth: what differed was the form that the social interaction took.

While it obviously could be that cognitive, temperamental or affective factors 'in' the child account for different strategies, it is much more likely that the strategies result from the interaction between child and interlocutors, rather than the child being conceived of as some 'sealed off parcel'. There has been a considerable amount of work which suggests that object-naming children have mothers who use the child's language as a guide to topic continuity (i.e. provide a lot of expansions of what the child says) and who are object-oriented themselves while the mothers of the more phrasal children have been found to be more directive and less interested in talking about objects. (Cross 1978, Nelson 1973). Thus, Tomasello and Todd (1983) found that mothers who are directive in establishing joint attention tend to have non object-naming children while those who tend to pick up on the child's focus of attention are much more likely to have object-naming children. There has been a strong tendency in the literature to treat the phrasal approach and by association the directive maternal style as if both were a major impediment to language development. But it could be that directive and expanding styles tend to highlight different aspects of language for the child to pay attention to and that this accounts for the differences in vocabulary learning and use. In Barnes et al. (1983), while directives and expansions were negatively correlated, both were associated with linguistic advance. This fits well with the idea that we are not necessarily talking about better and worse ways to learn to talk but about different ways of doing it. We then need to pay close attention to the precise characteristics of the interaction between the child and her/his interlocutors in order to work out what guides to segmentation are being given. An example of this comes from a study by Goldfield (1985) in which the more directive mother also uses more social routines and games than does the other mother who is more likely to use objects as the focus of conversation. This may in turn also lead a child to use larger 'chunks' in learning to talk and to the use of a more phrasal-pivotal style. On the other hand, in the ongoing study mentioned above (and in a separate study by Pine, also in our Lab) it is our distinct impression that object-naming, rather than being the result of the application of an abstract analytic skill on the part of the child as has frequently been claimed, often derives directly or indirectly from the mother's desire to teach the child language - an easy way to do this is to teach the names of

things!

We need to know whether there is good statistical evidence for an association between so-called directive styles of babytalk and a stronger dependence on social routines and games by these caretakers. And in turn, are either of these factors associated with a phrasal-pivotal style in their children? In societies in which babytalk seems highly directive (e.g. Samoa: Ochs 1983, Kaluli: Schieffelin 1985) are children more likely to be non object-namers? (Pine's study is addressing these issues directly).

Summary and conclusions

In conclusion, the argument I am making is that the environment probably generates a particular kind of initial strategy, but what defines the characteristic features of these strategies is some of the most basic dimensions of all languages: word order and inflections; prosody and lexemes; syntagmatic and paradigmatic productivity. So, by looking in detail at systematic variation between children learning the same language, and also by looking at variations in language learning across languages, we may explicate what are the central and, to some extent, separate, aspects of language that children have to master.

It is vitally necessary to take the question of differences in strategies for language learning seriously if a psychologically realistic theory of language development is being aimed for. In identifying these strategies, we can see much more clearly where there is real continuity from previous development and where there may be discontinuity. Imposing a false unity on development either leads to a denial of any continuity (and a claim for simple nativism) or to the denial of any discontinuity (leaving nothing to explain!). In actually identifying development, albeit in more than one way, we allow ourselves to start asking sensible questions about the causes of that development, presumably both evolutionarily and interactionally determined.

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