

# Typological Perspectives on Language Acquisition: Do Crosslinguistic Patterns Predict Development?

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Questions about the role of meaning have been fundamental to first language acquisition research since the early 1970s. At first, hypotheses about the kinds of meanings children might bring to language learning came primarily from Piagetian research, with an emphasis on notions of object permanence, agency, causality, and topological and projective spatial relations. Such concepts, although clearly important, are too global to fit closely with the categories of meaning expressed by the words, inflections, and grammatical patterns of language. So it is not surprising that researchers soon turned to linguistics for ideas about language learners' meanings, and, in particular, to the growing subdiscipline of linguistic typology.<sup>1</sup> In typological research, languages are compared in search of universals and other patterns such as 'universal tendencies' (phenomena that are very widespread, even if not true of all languages) and 'grammatical hierarchies' (shared underlying dimensions along which different languages make cuts in different places). While the causes of typological patterns are often unclear (see Comrie, 1981, Croft, 1990, and Hawkins, 1988, for discussion), it seems likely that at least some of them reflect deep-seated properties of human perceptual, cognitive, and communicative activity, which children might also be expected to share.

## **Are children guided by prestructured meanings?**

By now there is considerable evidence for a link between typological patterns and children's early meanings. In a pioneering early study, for example, Clark (1977) found a relationship between children's overextensions of object words and the semantics of noun classifiers in languages around the world:<sup>2</sup> in both, 'objects are categorized primarily on the basis of shape, and the same properties of shape appear to be relevant in acquisition and in classifier systems.' In another domain, Andersen (1978) pointed to correspondences between the way languages classify body parts and patterns in children's learning of body-part words.

Additional evidence comes from word substitution errors in which children collapse meaning distinctions that are obligatory in their language but often not made in other languages (Bowerman, 1978, 1985). Examples in English include (1) the occasional use of spatial morphemes where temporal ones are needed (e.g., *behind* for *after*), a common principle of both polysemy and language change (Traugott, 1978); and (2) interchanges of *make* and *let* in periphrastic causatives (e.g., 'MAKE me watch it' [campaigning to be allowed to watch a TV program]; 'Don't LET me go to bed' [begging to stay up]). These constructions show a tendency to blur the distinction between active (*make*) and permissive (*let*) causation; many languages, although not English, express such meanings with a causative morpheme that applies to causation of both kinds (Comrie, 1981, 64).

Children's underextensions are also often typologically well motivated. For example, Slobin (1985) found that children initially restrict markers of transitivity--the accusative case in languages like Russian and the ergative case in languages like Kaluli--to sentences that specify a causal event in which an agent intentionally and directly brings about a physical change of state in a patient. This category serves as the conceptual core of markers of transitivity in all languages (Hopper & Thompson, 1980), and it is often the historical starting point for forms that expand into general markers of transitivity (Givón, 1975). From evidence like this, Slobin (1985) hypothesized that the first grammar of all children is based on a set of core meanings that figure repeatedly in language typology, language change, and creolization.

Children are not, then, initially a *tabula rasa* when it comes to the organization of meaning. But how strong in fact are their semantic predispositions? On close inspection, it seems that they are weaker than has often been thought. Interesting errors notwithstanding, children do not, in general, go through a shared 'universal' phase of semantic development. Instead, they are remarkably quick at figuring out semantic patterns that are specific to the language they are learning (Bowerman, 1985). For example, by 17 to 20 months of age, children learning English and Korean categorize familiar and novel motions along a path in strikingly different, and language-specific, ways (Choi & Bowerman, 1991). And by at least age three (the youngest group studied), children telling narratives in English, German, Hebrew, Turkish, and Spanish impose a highly language-specific organization on temporal and spatial meanings (Slobin, 1991).

### Resolving the paradox

We are thus faced with a paradox. We have evidence, through children's errors, that learners are not just attending to the input but are actively entertaining linguistically sensible ways of organizing form-meaning correspondences, even when these are not displayed in the language being learned. But we also have evidence, through productive, correct language use, i.e., ABSENCE of errors, that learners are amazingly good at homing in on language-specific semantic patterns. How can we resolve this seeming contradiction, and develop an account of children's learning that integrates both facets of their behavior?

One important step toward this goal is to adopt a more systematic approach to children's construction of meaning. So far, our field has applied typological insights to language acquisition rather erratically. In particular, we have attended only to 'hits'--ways in which something children do corresponds to some salient pattern in 'other languages'. We do not look as enthusiastically for 'misses'--e.g., errors that might have been expected but do not occur, or errors that go COUNTER to typological patterns. It is time to draw out and test predictions more explicitly.<sup>3</sup>

Some obvious predictions concern relative ease and accuracy of acquisition. For example:

1. Do children learn the meaning of a linguistic form faster when it is based on categorization principles commonly associated with comparable forms in other languages? Conversely, do they learn categories based on infrequently used principles more slowly? (This prediction assumes that the crosslinguistic frequency of a category reflects something like its 'naturalness' for human beings, where naturalness may be based on a combination of factors such as cognitive, perceptual, and functional salience.)
2. (Closely related to question 1:) When children deviate from adult usage, as in the substitution errors mentioned earlier, do their errors reflect a principle of semantic categorization that is crosslinguistically more frequent than the one used by their own language? (If relative frequency reflects 'naturalness', children should err on infrequent ['hard'] patterns in the direction of more frequent ['easy'] patterns, and not the reverse.)

Other predictions concern the order in which children will extend forms to novel contexts. For example:

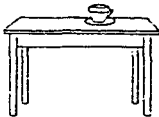
3. When a semantic category is organized crosslinguistically around a prototype, in the sense that languages agree on the membership of core instances but disagree on where to place the boundary between more peripheral instances and noninstances, do children begin by restricting the relevant linguistic form to core instances, and extend it only later to less central instances as they find evidence for this in the input language?<sup>4</sup>

4. (Closely related to question 3:) In the case of grammatical hierarchies (implicational scales) on which languages make cuts in different places, do children begin at the most restricted (left-most) end of the scale and--again on the basis of positive evidence--work along it systematically until they reach the cutoff point for their language? (This will be illustrated shortly.)

### Testing predictions

**Predictions 1 and 2.** There is as yet little evidence concerning Predictions 1 and 2--whether rapid and error-free acquisition is related to frequency. In a test of Prediction 1, Gentner (1982) argued that the meanings of concrete nouns are relatively uniform across languages while the meanings of predicates are more variable, suggesting stronger psychological constraints on the conceptualization of objects than of relationships. Consistent with this, she found that children learn object words earlier than relational words. The results of another study (Bowerman & Gentner, in preparation) are consistent with both predictions. Gentner and I examined how learners of English and Dutch talk about spatial configurations like '(toy) dog on book', 'clothes on line', 'handle on cupboard', 'ribbon on candle', 'cookie in bowl', and 'marble in water'. For frequency information about how languages classify such configurations, we drew on a typological investigation of 23 languages from 11 language families (Bowerman and Pederson, 1992).

Consider spatial situations like those shown in Figure 1:



a. cup on table



b. handle on cupboard door



c. apple in bowl

Figure 1. Three spatial configurations.

Many languages, e.g., English, group configurations like (b) together with those like (a) under the same spatial morpheme; i.e., they extend the morpheme used most prototypically for objects on a horizontal surface (e.g., *on*) to other situations of contact with or attachment to an external surface, regardless of orientation, and they use a separate morpheme (e.g., *in*) for containment relations. In a second, less frequent pattern, languages group (b) together with (c), and use a separate morpheme for (a) (e.g., Finnish; see Bowerman, in press). The motivation for this grouping may be that attachment to an external surface can be construed as similar to containment on a dimension of 'intimacy' or 'incorporation'. In a third pattern, situations like (b) are grouped with neither (a) nor (c), but are described with a third spatial morpheme that is somewhat specialized to nonhorizontal attached and hanging relations; this pattern, shown by Dutch, is apparently rare.

Gentner and I found that learners of both English and Dutch were skilled by age 2;6-3;0 (the youngest group tested) at distinguishing containment relations (as in c) from everything else, suggesting the cognitive ease of this typologically frequent distinction. And learners of English were quick to use the preposition *on* for situations like both (a) and (b), which also accords with the frequency of this pattern. Dutch children, on the other hand, had trouble with the distinct preposition (*aan*) needed for situations like (b), and they sometimes overextended to them the preposition they used (correctly) for situations like (a) (i.e., *op*); they did not, however, describe them with the preposition they used for situations like (c) (*in*). These findings are compatible with the prediction that semantic classifications that are frequent in the world's languages are easier for learners than those that are infrequent, and that errors will reflect a classification pattern that is more frequent than the one found in the learner's language.

Errors in this case were consistent with Prediction 2. But this is not always so. One striking set of exceptions involves causative constructions. In English there is a semantic difference between lexical and periphrastic causative constructions: the former is used to express relatively direct causation (e.g., by hands-on manipulation), whereas the latter is used for indirect causation (e.g., by command or magic powers: compare *I stood the child up* and *I made the child stand up*; *I raised the cup to my lips* and *I caused the cup to rise to my lips*). This alignment of direct and indirect causation with lexical vs. periphrastic (or morphological) causatives appears to be universal; it is explainable, suggests Haiman (1985), by reference to an iconic principle of conceptual distance: 'the linguistic distance between cause and effect is motivated by the conceptual distance between cause and result, and

the conceptual (or in some cases, physical) distance between causer and causee' (p. 111).

Given the generality and apparent exceptionlessness of this pattern, one would not expect children to violate it, at least not once they are capable of producing both lexical and periphrastic causatives. But my diary records from my two daughters contain many violations, e.g., periphrastic causative for direct causation: 'Would you **make** it come on my foot' (3;10; request for M to **put** her roller skate on); lexical causative for indirect causation: 'You **put** me forward a little bit' (3;8, when child lurches forward in her carseat after M starts the car) (Bowerman, 1982). Why this particular typologically-based prediction is not borne out is not clear.

**Predictions 3 and 4.** Do children extend forms to novel contexts from the core of a prototype outward, or from left to right along a grammatical hierarchy? I am not aware of any detailed studies of this. The question seems ripe for careful exploration.

Grammatical hierarchies characterize patterns of crosslinguistic variation by specifying which language types do and do not occur (Croft, 1990, 96-7). For example, the hierarchy 'singular < plural < dual' specifies that there are languages with only singular noun forms (these languages lack the category of number), languages with both singular and plural forms, and languages with singular, plural, and dual forms; what the hierarchy rules out is languages with both singular and dual forms, but no plural forms.

One particularly interesting hierarchy from a developmental point of view is the so-called ANIMACY HIERARCHY. This hierarchy, which is actually a combination of several distinct but interacting dimensions, including animacy proper, person, and NP-type (noun vs. pronoun), runs like this (Croft, 1990, 112-3):

First, second-person pronouns < third-person pronouns < proper names < human common nouns < nonhuman animate common nouns < inanimate common nouns.

Within these categories finer subdivisions may also be made; e.g., within humans between males and females/children, and within nonhuman animates between 'higher' and 'lower' animals (as culturally defined).

Across languages, the animacy hierarchy controls a large number of distinctions, with the exact cutoff point between 'more' and 'less'

animate being specific to the language or to the particular form within the language: e.g., more animate direct objects may be marked differently from less animate direct objects, or more animate NPs may agree with the verb whereas less animate ones do not (see Comrie, 1981, Ch. 9 and Croft, 1990, Ch. 5). Also sensitive to the animacy hierarchy is number marking, with nominals that are higher (further left) in the hierarchy more likely to have obligatory plural forms--or optional but more frequently used plurals--than nominals that are lower (further right). Some examples based on Croft (1990) and Lucy (1992) are shown in Figure 2:

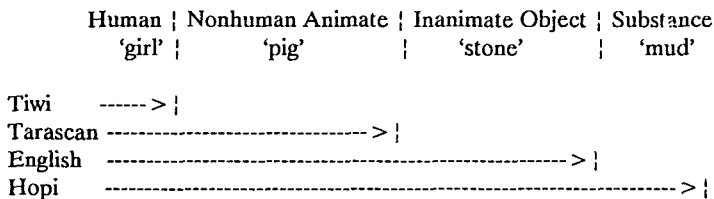


Figure 2. The range of plural marking in four languages.

Are children influenced by the animacy hierarchy? For example, when they begin to learn plural markers, do they at first extend them only to nouns naming humans, later to nouns for human and nonhuman animates, and still later to nouns for inanimate objects? Studies of plural marking in English have not explicitly investigated this, but I believe it is unlikely (Bowerman, 1985, 1300-1). However, it is possible that during the long period when children do not produce plural markers consistently in all the contexts that require them (Brown, 1973), they will tend to mark nouns like *girl* more often than those like *stone*. This would suggest that learners too are sensitive to whatever it is, exactly (topicworthiness? individuatability?--cf. Comrie, 1981, 190-2 for discussion), that the hierarchy reflects.

### Conclusions

In closing, let me directly address the two questions that were posed to this panel. The first question was 'What is the relationship between the process of learning language and the structure of what is learned, i.e., the grammar of the language?' From the typological point of view there should be a strong relationship: the child learner is envisioned as shaped and constrained by the same perceptual, conceptual, and communicative forces that shape and constrain the structure of language itself. Of course, the extent to which this is true is still to be determined.

The second question was 'How should linguistic theory and language acquisition research influence each other?'. Typological linguistic theory obviously provides a rich source of hypotheses for developmentalists to test, as I've just discussed. As for influences going the other way, it seems to me that evidence concerning which predictions are borne out and which are not may ultimately help in establishing the causes of typological patterns.

For example, we can expect that patterns hypothesized to reflect simply 'how human beings conceptualize the world' should, in general, be evidenced in children too. (Of course, some patterns could be cognitively determined but still not be available to young children because of their cognitive immaturity.) In contrast, typological patterns that do NOT play their hypothesized role in acquisition may reflect other kinds of influences that do not affect young children as much as adults, e.g., the requirements of language as a rapid, on-line system of communication, pressures concerning the organization of extended stretches of discourse, or competition between elements from different parts of a fully developed system. To the extent that language acquisition might provide clues to the causes of typological patterns, it would contribute to the important task of developing an EXPLANATORY typological theory--a theory that accounts for why there are the patterns that there are, and not others.

### Notes

1. For excellent overviews of the typological approach, see Comrie (1981) and Croft (1990). Related fields that have similarly influenced research on language acquisition are the study of language change (e.g., Traugott, 1978) and of pidgins and creoles (e.g., Bickerton, 1981).
2. Noun classifiers are markers that in many languages obligatorily accompany nouns in specific syntactic contexts, such as after numerals; e.g., *two ROUND-THINGS balls/stones, five LONG-THINGS pencils/poles, three FLAT-THINGS rugs/newspapers*.
3. For an interesting example of explicit prediction-testing, see Cziko's study of how well children conform to the aspectual distinctions specified by Bickerton's (1981) language bioprogram hypothesis.
4. This prediction, which is related to the 'subset principle' in learnability theory, has been made by Slobin (1985) to explain how children arrive at the adult extension of transitivity markers, and by Schlesinger (1974) to account for how children could discover the boundaries of the notion of 'agent' in their language.

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