Interfaces between linguistic typology and child language research

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1. Introduction

Frans Plank, the Editor-in-chief of *Linguistic Typology* (*LT*), posed the following questions to the Editorial Board (e-mail, August 14, 2006):

> LT has now been in circulation for a decade. Time to ask several questions:
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> ○ Has headway been made in Linguistic Typology – the journal and, even more importantly, the eponymous field? Or have we been going round in circles?
> ○ What has most memorably been found out in typology, and what is there yet to discover (the lexicon, phonology, ...)?
> ○ What state is typology in now, intellectually and academically, and where will it go in the future?
> ○ What indeed ɪs typology and what is not? What is, or ought to be, special about the aims, methods, and results of typology, in relation to other types of linguistic pursuits? Such as: grammar and dictionary writing; field linguistics; historical linguistics, deep and shallow time; sociolinguistics; psycholinguistics; language acquisition/learning and teaching; computational linguistics; well, "theoretical" linguistics; ...

These questions led us to think about the role of linguistic typology in our own research, and in child language research more generally. Both fields, typology and child language, are ultimately concerned with characterizing the nature of human language, and some language acquisition researchers make active use of typological frameworks in motivating and interpreting their investigations. At the same time, however, the immediate aims and methods of the two fields are rather different. So language acquisition research does not seem to offer direct answers to any of Plank's important questions, although there are certainly points of contact.

Plank has defined the goals of typology (2005, LSA Symposium) as documenting "variation across languages (as mentally represented and socially

shared) in time". Typologists are concerned with diversity and uniformity of languages in order to more fully specify the defining and interacting dimensions of language.[1] In contrast, child language researchers are concerned with diversity and uniformity in the ACQUISITION of language. Their goal is to characterize children's basic capacity for language (i.e., possible predispositions and relevant learning procedures), and to determine how this capacity interacts with the linguistic and social input to produce knowledge of one or more specific languages.

The point of using the crosslinguistic method in studying child language is not to discover and account for possible and impossible covariations of linguistic factors, but to disentangle candidate explanatory principles by studying the acquisition of contrasting language types. One important source of clues lies in information about which sorts of linguistic constructions and covariations are relatively easy or difficult for the child to master. Here, attention to typology is critical, since it provides us with a means of selecting appropriate languages for particular research goals. Most often, though, what developmentalists do in practice is to treat typology as a source of linguistic TAXONOMIES, or structured catalogs of linguistic variables, rather than as a theoretical approach that can inform our research more deeply.

In this article, we briefly overview methods and data of child language research, and present some examples of the use of typology in our field. We conclude by discussing some ways in which a closer interaction between typologists and developmentalists can be fruitful. Although most of the influences are one-way, from typologists to psycholinguists, there are promises of useful two-way interaction.

2. Basic research questions

The basic research question in child language is not whether a particular combination of features can co-exist to define a language. For that matter, it is not even clear if every individual stage of development of every language is actually "a possible human language" in the adult sense. The basic questions are part of developmental psychology and have to do with processes and mechanisms of change over ontogenetic time – change toward a relatively fixed end point. The goal is to arrive at models of learning processes, or, more generally, models of plasiticity and change. Such models require a conceptualization of

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1. We leave out of consideration the Chomskyan programs of defining linguistic universals as innate, or defining parameters and parameter-setting as biologically determined. In our opinion, speculations about the "hard-wiring" or genetic foundations of human language competence are premature with regard to the research goals discussed here. The goals must be to first adequately define the parameters or dimensions of variation and to describe the course of acquisition of a number of languages of different types.

the starting point – that is, we seek to determine the child's initial presuppositions towards particular sorts of formal and conceptual structures.

Within this broad framework, it is still an open question whether language development is different in any important BASIC sense from other sorts of development. As in all of psychology, the comparative method is essential – across species, cultures, genders, social frameworks, and so forth – and, in the case of language, across languages. Typological descriptions of languages enable today's developmental psycholinguists to intelligently choose languages for comparison. By way of contrast, almost all child language investigations of the nineteenth and early twentieth century were limited to European Indo-European languages, and even to this day, virtually every textbook, in every branch of American psychology, refers simply to "the child", or "the individual", or "people", with no further nuances of language or culture.[2]

3.   Methods and data

Child language researchers are denied most of the methods available to linguistic typologists. We can't find descriptions of any "child language". There are no published grammars – only partial descriptions of subsystems of selected languages. We can't work with linguistic consultants (therefore no judgments of acceptability or grammaticality, no translations, no elicitation of counterexamples – at least from very young children). We can record children's speech and devise methods to assess their production and comprehension of particular constructions and meanings. The methods determine and constrain the type of data available for analysis.

The most basic data in the study of acquisition have always been representations of children's spontaneous speech. Beginning in the eighteenth century, and until the development of portable taperecorders in the middle of the twentieth century, all of the data consisted of handwritten diary notes and transcriptions, almost exclusively of the CHILD's speech, with little or no documentation of input or interaction. For the last half-century or so, the data are much richer, with detailed transcriptions of tape-recorded, later video-recorded, child-

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2. With regard to acquisition of signed languages, one of us has emphasized (Slobin 2005) that there are almost no sign language researchers – in North America, Europe, or Japan – who have taken account of the fact that their sign languages are all typologically distinct from the surrounding spoken languages (e.g., all of the spoken languages in these countries are dependent-marking, whereas signed languages are head-marking). As a consequence, most attempts to explain acquisition of sign language by comparison with some spoken language are seriously misleading. (But see Zeshan's (2004a, b) innovative project on sign language typology. Using data from a collection of sign languages employed outside of the standard set of industrial countries, Zeshan asks: "Do sign languages constitute a distinct linguistic type and what would characterize that type?" (http://www.mpi.nl/world/SignLang/WEB-FINAL/startpage-new.htm).)

caregiver (and occasionally peer-peer) interactions. However, the transcripts are almost always at the morphological/lexical level, lacking information on prosody and most of phonology (except for particular studies focused on phonological development).[3]

For researchers interested in doing detailed research on language acquisition, whether within or across languages, there are several possible paths to follow. One can design a new project, get funding (and human subject committee approval), hire or recruit assistants, and gather data directly from one or at most a few children learning a particular language or languages. The resulting data are typically either descriptions of some brief developmental window in one language, with possible comparisons to a handful of others, or descriptions of change over varying time periods (e.g., Bowerman 1973, 1975, R. Brown 1973). However, collecting and processing primary data is extremely expensive in terms of time, money, and personnel, so researchers nowadays often work with published or online transcripts of child-caregiver interaction (on CHILDES [The Child Language Data Exchange System], http://childes.psy.cmu.edu), with comparisons limited to a small set of languages. In addition, a systematic set of descriptions of language development across a wide range of languages and language types can be found in the five volumes of *The Crosslinguistic Study of Language Acquisition* (Slobin (ed.) 1985a, 1985b, 1992, 1997a, 1997b).[4] Researchers also conduct brief probes (called "experiments") to assess children's comprehension or production of a particular piece of language.

Assessing productivity in spontaneous speech data is a major problem, especially with small samples (typically an hour of recording on a weekly or less frequent basis), although various methods have been devised (e.g., R. Brown 1973). Therefore, children's errors have been an especially important source of information. Indeed, the nineteenth-century interest in the role of the child in language change was due to numerous analogical errors in inflectional forms of verbs and nouns in several European languages. For example, overgeneralizations of the English past tense, such as *falled* and *breaked*, suggested that morphological change might be motivated by children's analogical pro-

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3. But see a survey by Peters (1997), titled "Language typology, prosody, and the acquisition of grammatical morphemes". She concludes (1997: 190–191): "If, as has been the thesis of this chapter, languages afford different paths for acquiring grammatical morphemes, and if this process is indeed influenced by phonetic and prosodic factors such as those presented here, important methodological considerations are entailed."

4. The volumes include child language data from the following languages, following a common topic outline: American Sign Language, Danish, English, Estonian, Finnish, French, Georgian, German, Greek, Hebrew, Hungarian, Italian, Japanese, K'iche' Maya, Kaluli, Korean, Mandarin, Norwegian, Polish, Portuguese, Romanian, Samoan, Sesotho, Spanish, Swedish, Turkish, Warlpiri, and West Greenlandic.

ductions. The American linguist William Dwight Whitney, like many linguists of his generation, explicitly appealed to acquisition in his discussion of analogical change (although see Bybee & Slobin 1982 and Slobin 2002 for opposing views). As he put it:

> Children, above all others, are all the time blundering in this direction – saying *gooder* and *badder, mans* and *foots, goed* and *comed* [...] The force of analogy is, in fact, one of the most potent in all language-history; as it makes whole classes of forms, so it has power to change their limits. (Whitney 1896: 75)

Another major focus of attention has always been on the semantic level. Developmental psychologists have long attended to children's understanding of the meanings of words and grammatical morphemes. Nineteenth-century psychologists such as Wilhelm Preyer, in *Die Seele des Kindes* (1882), voiced the position that the child's first words are based on pre-existing concepts:

> Whoever has conscientiously watched the intellectual development of infants must be convinced that the formation of concepts does not go hand in hand with the acquisition of words, but is a necessary condition to the understanding of the first words that are to be learned. (In Bar-Adon & Leopold 1971: 30).

And linguists such as Otto Jespersen held that "[a] child develops conceptions of his own which are as unintelligible and strange to the uninitiated as his sounds" (Jespersen 1922 [1964: 114]).

We would now emphasize a more nuanced interaction between the child's early concepts and the emergence of linguistic meanings. On the one hand, children often use words and inflections in contexts in which adult speakers would not. These overextensions indeed corroborate that children come to language acquisition with concepts of their own, and these concepts are often linguistically "sensible", in that they reflect semantic groupings or distinctions often made in languages, even if not in the one the child is learning (Bowerman 1980, Clark 2001, Slobin 1985). On the other hand, recent research shows that learners are not insistent on their own semantic categories, but begin to show sensitivity to language-specific categories from a very young age (e.g., Bowerman & Choi 2001). Questions of the underlying semantic dimensions of languages and their typological distribution provide an important interface between linguistic typology and language acquisition.

Child language data don't lend themselves to the writing of full grammars, but insights are gained from analyses of subsystems, as in much of typological research. In general, criteria of frequency of occurrence and co-occurrence of forms and constructions, along with performance on various sorts of tasks, are combined to create a profile of an individual child's possible construal of a particular aspect of a particular exposure language during a particular time

period. Except for a few highly studied languages, especially English, we lack sufficient data to assess the range of individual differences in the acquisition of any given language (see Lieven 1997 for a discussion of "variation in a crosslinguistic context").

4.   Several research examples

In spite of the various limitations just summarized, there is a small research literature in which some aspects of the acquisition of several languages are compared. Occasional articles comparing the acquisition of two or more languages appear in the *Journal of Child Language*, the quarterly flagship journal of the International Association for the Study of Child Language (IASCL).[5] The most useful crosslinguistic acquisition studies are those in which contrasting languages are strategically chosen in order to focus on particular developmental or psycholinguistic issues of interest. A small number of projects stand out here.

4.1.   *The Berkeley four-language project*

This project, designed in 1970 and carried out 1972–74, may still be the largest single project aimed at specific typological comparisons in language development, across many formal and semantic subsystems of language and including cognitive measures (summarized in Slobin 1982).[6] The languages were English (Berkeley), Italian (Rome), Serbo-Croatian (Dubrovnik), and Turkish (Istanbul). Data included recordings of adult-child conversation, specific production

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5. The *Journal of Child Language* publishes articles dealing with many languages; however, there are vanishingly few articles that make any comparisons between languages. A search through the 172 articles published in the journal this century (2000–2006) turns up only 20 articles comparing two languages, and none comparing more than two. (Generally, one of the languages is English, compared with: Catalan, French, Italian, Japanese, Korean, Norwegian, Polish, and Spanish. Otherwise, there are comparisons of Catalan and Spanish, Dutch and Hebrew, French and Greek, Greek and Spanish, French and Langue des Signes Québécoise, and Navajo and Quechua.) There are no broader comparisons, and almost no discussion of typological factors. Note, however, that a typologically-inclined investigator could make use of the considerable range of languages reported (although it would be hard to find articles dealing with a common topic across languages). The languages reported in 2000–2006, with numbers of reports, are: British Sign Language (1), Cantonese (4), Catalan (3), Dutch (3), English (101), Esperanto (as first language!) (1), Estonian (1), Finnish (2), French (12), German (7), Greek (3), Hebrew (14), Hindi (1), Italian (5), Japanese (3), Korean (2), Langue des Signes Québécoise (1), Mandarin (4), Navajo (1), Norwegian (1), Polish (4), Quechua (1), Russian (1), Sesotho (1), Spanish (7), Swedish (3), Tamil (2), Turkish (1). In sum, the published data in journals and anthologies are still not rich enough to support deep or extensive typological analyses of child language acquisition.

6. Various subprojects are reported in Aksu-Koç & Slobin (1985, 1986), Ammon & Slobin (1979), Johnston & Slobin (1979), Slobin (1977, 1981, 1986, 1994, 1995), Slobin & Bever (1982), Slobin & Talay (1986).

and comprehension tests, and Piagetian measures of cognitive development. The languages were chosen to contrast on a number of dimensions:

(i)   increasing freedom of word order: English < Italian < Serbo-Croatian < Turkish;
(ii)   SVO (English, Italian, Serbo-Croatian) vs. SOV (Turkish);
(iii)   prepositional (English, Italian, Serbo-Croatian) vs. postpositional (Turkish);
(iv)   case-inflectional (Serbo-Croatian, Turkish) vs. non-case-inflectional (English, Italian);
(v)   synthetic (Serbo-Croatian) vs. agglutinative (Turkish) case inflection;
(vi)   regularity of morphology (Turkish) vs. varying types of irregularity (English, Italian, Serbo-Croatian).

A number of systematic studies revealed common strategies and conceptual development, along with the emergence of different sorts of attentional strategies related to morphosyntactic characteristics of the exposure language. Note that although typological analysis was essential in the design of the study, the findings do not directly contribute to an understanding of linguistic typology.

4.2.   *The frog-story project*

This project, designed by Dan Slobin and Ruth Berman (Berman & Slobin 1994) beginning in 1980, is still continuing on a worldwide basis, involving many independent researchers at this point. The research tool is a children's storybook that tells a story in 24 pictures with no words. This makes it possible to elicit narratives that are comparable in content but differing in form, across age and languages. There are now data from dozens of languages and most of the world's major language types (summarized in Strömqvist & Verhoeven (eds.) 2004). The Berman & Slobin study compared English, German, Spanish, Hebrew, and Turkish on a range of dimensions. Here there was more interest in covariation of typology and behavior than in the earlier four-language project (e.g., attention to manner of motion as a function of the typological status of the language as satellite-framed or verb-framed; Slobin 1997a, Talmy 1985, 1991).

Both the four-language project and the frog-story project are useful in making it clear to psychologists that languages differ from one another on a range of dimensions. Therefore, one can't make generalizations about, say, the acquisition of English, simply as an example of acquisition of a particular "type" of language. On most dimensions studied, the languages contrasted in varying ways. For example, whereas attention to manner of motion groups English and German vs. Spanish, Hebrew, and Turkish, attention to temporal dimensions of events (aspect) groups English, Spanish, and Turkish vs. German and Hebrew.

4.3.   *Intratypological comparison*

Close comparison of highly similar languages is especially useful in revealing mechanisms and processes of acquisition. For example, Smoczyńska (1985) compared acquisition of the Polish and Russian case inflectional paradigms, which differ significantly only on the phonological level. She found that the Polish paradigm, without reduction of unstressed vowels, was quickly and easily mastered, whereas the Russian paradigm, with reduction of unstressed vowels to schwa, presented acquisition problems for many years, due to the homophony of a number of forms in the paradigm. Similarly insightful intratypological comparisons have been done within Finno-Ugric languages (Dasinger 1997) and within Mayan languages by P. Brown (Tzeltal), Pfeiler (Yucatec), de Léon (Tzotzil), Pye (K'iche') and Mateo (Q'anjob'al) (Pye et al. in press). Other intratypological research is being carried out in various places on Bantu, Slavic, Romance, and Germanic.

4.4.   *The Nijmegen research*

A number of crosslinguistic and crosstypological investigations of language acquisition have been carried out at the Max Planck Institute for Psycholinguistics in Nijmegen by Melissa Bowerman and her colleagues (Bowerman 1994, 1996, Bowerman & Brown (eds.) in press, Bowerman, de Léon, & Choi 1995, Bowerman & Choi 2001, 2003). This work has been critical in demonstrating a lack of expected universal conceptual starting points for the acquisition of grammatical morphemes and lexical items, particularly in the domain of spatial relations. For example, a comparison of early acquisition of English and Korean (Choi 1997, Choi & Bowerman 1991, Choi et al. 1999) revealed that infants can be easily tuned by the exposure language to attend to either containment vs. support (English) or tight fit (either containment or support) vs. various kinds of loose contact relations (Korean). At the same time, the research motivates a search for basic underlying dimensions of meaning available to all children, and probably all languages.

The Nijmegen research includes both naturalistic and experimental data, and has been extended to a number of semantic domains and language types. A fruitful recent crosslinguistic investigation compares children's encoding of events of cutting and breaking across a systematically chosen set of languages (Bowerman et al. 2004). (See Annual Reports and working papers of the Institute at http://www.mpi.nl for reports of this research, along with the comparative Mayan acquisition research mentioned earlier.) Some of the work uses semantic maps to display similarities and differences in the categorization of referent events across languages, and across age groups within the same language. This represents a convergence in techniques between crosslinguistically-minded language acquisition researchers and linguistic typologists (see Croft 2007 and Haspelmath 2007).

4.5. *The Vienna research*

Wolfgang U. Dressler heads a large project, based at the University of Vienna, under the rubric "Crosslinguistic Project on Pre- and Protomorphology in Language Acquisition" (see Voekova & Dressler (eds.) 2006 for the most recent set of research papers). The project is an international collaboration on early morphological development across a broad range of languages belonging to various typological groupings. Similar to projects mentioned above, the goals are to determine universal processes of language acquisition as well as to pinpoint particular strategies, on the basis of relative ease of acquisition of morphological systems that are comparable in one way or another.

4.6. *Specific Language Impairment (SLI)*

Laurence B. Leonard, at Purdue University, studies SLI in a crosslinguistic framework, testing claims about sources of language difficulties of English-speaking children by making explicit comparisons with SLI children learning other languages, including Cantonese, Hebrew, Italian, Swedish, and Spanish. The crosslinguistic method makes it possible to search for general patterns of difficulty – but, again, the focus is not typological (Leonard 2003); rather, languages are selected because they contrast with regard to the expression of grammatical forms that typically pose problems for English-speaking children.

5. Conclusions

In sum, various child language studies make critical use of typologically-oriented descriptions and classification of languages. Careful sampling of languages of different types is necessary for evaluating hypotheses based on research with language(s) of a single type. But, as far as we can determine, the interaction between linguistic typology and developmental psycholinguistics is so far mostly one-way, with the child language researchers greatly benefiting from insights provided by typologists.

Much can be gained when typologists and crosslinguistically-minded acquisition specialists put their heads together to test hypotheses about how children learn language. An example is a recent interdisciplinary collaboration on the nature of argument structure conducted at the Max Planck Institute for Psycholinguists (Bowerman & Brown (eds.) in press). Linguists scrutinized their field languages to assess the viability of influential acquisition proposals stating that children are guided by *a priori* knowledge of putative form-meaning universals – e.g., that words for actions are likely to be verbs, or that verbs of object transfer are associated with three arguments whereas verbs of perception are associated with only two. A number of phenomena challenging these assumptions were identified. The typologists were motivated to consider crosslinguistic patterns in terms of their developmental and cognitive implica-

tions, and researchers from both disciplines were prompted to consider how acquisition proposals must be revised in order to handle a more realistic range of crosslinguistic variation.

Another interface can be found in the learning phenomenon that Slobin has called "typological bootstrapping" (Slobin 1997b). Typologists are concerned with interdependent patterns within a language (e.g., Hawkins' 1983 "principle of cross-category harmony"). The typological bootstrapping idea is that things hang together for children too: that they can predict certain things about what they are now learning or going to learn on the basis of what they've already learned. As Slobin has put it (1997b: 315):

> [A]s the child develops a successful explanatory structure for part of the exposure language, other parts become more accessible – that is, a coherent theory of the language begins to emerge. This is true, in part, because the language really IS a fairly coherent system – as a result of constant balancing out of competing forces. Over time, each language acquires a typological character resulting from the particular interplay of forces in its history.

Here, the goals of typology and language acquisition are different, but there is still a convergence: it is useful in both fields to look beyond individual clauses, verbs, etc., for larger patterns that cohere, either in the language or in the learner.

Basic to the goals of both disciplines is a FUNCTIONAL approach – that is, an approach that seeks to find functional explanations for occurring and non-occurring patterns of covariation in human language. Constraints of both language acquisition and language use determine the shape of human languages. From the typological point of view, there should be a strong relationship between the process of learning language and the structure of what is learned: "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" (Bowerman 1993: 13). And if one pays serious attention to data of language USE, in addition to language description, typology becomes a concern of psycholinguistics and developmental psychology, and performance data can motivate revisions of typological descriptions. (See, for example, Slobin's proposed revisions of Talmy's verb- and satellite-framed typology in Slobin 2004 and 2006, based on both child and adult performance data of various sorts.)

We conclude this brief overview with statements that each of us has made earlier, reflecting our conviction that crosslinguistic investigations of both languages and their acquisition are essential for understanding the nature of human language. According to Slobin (1997a: 35):

> One cannot make claims about the acquisition or use of a grammatical form without situating it typologically in a network of interactive psycholinguistic factors.

Some of these factors are a consequence of online information processing at the clause level, while others require attention to the organization of information in connected discourse. As a result, the acquisition and development of any linguistic form or construction must be considered in the light of its "functional load" within the language and speech community. A full theory of language acquisition and development will thus have to attend to three levels of analysis: UNIVERSALS and TYPES and FUNCTIONS.

And according to Bowerman (1993: 14):

> Typological linguistic theory obviously provides a rich source of hypotheses for developmentalists to test. As for influences going the other way [...] evidence concerning which predictions are borne out and which are not may ultimately help in establishing the causes of typological patterns [e.g., as reflecting basic human conceptual predispositions vs. the requirements of language as a rapid, on-line system of communication]. [...] 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.

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