Linguistic typology and theory construction: Common challenges ahead

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1. Introduction

The goal of this article is twofold: to present a brief overview of differences and similarities between formal grammars (regardless of particular mode of implementation) and typology, and to outline the common challenge faced by both. To anticipate our conclusion, typological approaches to language and theory construction have much to offer each other, but need to engage in a real dialogue, rather than merely talk about the need for such a dialogue. Otherwise both orientations run the risk of becoming (increasingly) irrelevant.

The idea that language structure is shaped by communicative needs of speakers has constituted a major thread in linguistic discourse over the last century – this idea is prominently represented in the Prague Linguistics Circle, in Roman Jakobson's work, in Simon Dik's Functional Grammar, and in much of linguistic typological work, which rests on the foundation of such earlier researchers. We agree with Nichols (2007) that the functional orientation of typology does not entail rejection of structure; rather, functionalism in typology manifests in the recognition of communicative, social, or processing needs as the reasons grammars are the way they are. To borrow a contrast from a different linguistic dialect, typology needs E-language to explain I-language (Chomsky 1986).

This inherently functional premise of typology is sometimes misunderstood, both by non-typologists as well as by typologists themselves. Among typologists, some are eager to use functions as operational criteria for the definition of a grammatical phenomenon, which leads to statements like "[i]n a prototypical active voice, the agent [...] is the most topical participant of the clause" (Givón 1990: 566), or "the structural complexity of a form tends to reflect conceptual or experiential complexity" (Newman 1996: 17), or "discourse factors – such as the saliency of the first argument – favor interpretation of the first argument as subject" (Chelliah 1997: 121). Pronouncements of this type provide

instant fodder for unsympathetic non-typologists, who might be forgiven for interpreting such formulations as an indication of typology's inherent neglect of grammar or structure (for similar comments, cf. Nichols 2007). The unfortunate consequence of this is that typologists must then spend precious time and energy refuting misrepresentations of typology that stem from quotes like the above.

A further unfortunate consequence of this lack of understanding between theory construction and typology is that the two do not realize that they are actually much closer to each other than might initially be assumed: over time, theory construction has learned to be sensitive to crosslinguistic details, and good typology has of course always depended on structural generalizations. A perhaps even more important consideration is that the field of linguistics as a whole is beginning to study language as a dynamic system operating simultaneously on multiple levels of representation – rather than as a disparate assemblage of discrete levels of analysis (lexicon, phonology, syntax), or as a collection of particular linguistic phenomena. This common challenge to both theory construction and typology is motivated by the increasing integration of linguistics with more technically sophisticated disciplines that also investigate human cognition and consciousness.

The study of language is thus no longer solely the prerogative of introspective investigation (since linguistics purports to be a social science, and not a branch of philosophy or literature) and/or generalizations made on the basis of individual grammars. Instead, language is something that can be measured using standard scientific method, and modeled on the basis of rigorously established data. The challenge no longer lies in bringing typology and theory construction closer together – the challenge lies instead in the continued survival of both approaches in the face of an imminent (if not ongoing) paradigm shift.

2.   What about data?

It is fair to say that a lot of the soul searching in modern linguistics has to do with the nature of the linguistic data used for purposes of analysis. Depending on orientation, it may be acceptable or unacceptable to use only naturalistic data, only discourse data, or only minimal pairs and grammaticality judgments. As we hope to show below, none of these approaches is sufficient in itself. In comparing typology and grammar construction, one notices that the differences in preferred data sources stem from how the respective orientations view language diversity and theory. With respect to the former, all linguists agree, without much hesitation, that natural languages share a number of intriguing similarities and also show fascinating differences. This agreement does not extend very far beyond this clause, however. Typologists ask why (and how) languages

differ, while grammar construction takes "the apparent richness and diversity of linguistic phenomena [to be] illusory and epiphenomenal, the result of inter-action of fixed principles under slightly varying conditions" (Chomsky 1995: 8). Such an approach leads one to ask why and in what ways languages are similar, at least at some deep level. Consequently, the two orientations start out asking very different questions.

This difference in initial questions leads to different kinds of data in the two approaches. Typology generally eschews uniform, all-questions-answered theorizing in favor of general constructs (markedness, iconicity, grammatical-ization) and methodological devices – for example, semantic maps (Croft 2003 and many others), often developed in reaction to more formal approaches. Its allegiance to large samples and "superficial" generalizations is simply one of the consequences of casting the net wide and looking for differences in a quick and easy way: testing for possible placement of a negative marker should reveal more variation across two hundred languages than it would across ten.

The absence of an articulated theory and the general fragmentation of typol-ogy at first blush come across as a severe handicap. For some, this constitutes a fatal flaw: "The solution to the problem of cross-linguistic comparison turns on the well-defined construction of linguistic systems. In the absence of such, the future of typology is bleak" (Steele 1997: 299). We think that this disad-vantage may also turn out to be an asset, one that we will discuss below when we return to the issues of theory and "reactive" responses in Section 3. How-ever, we do agree that the lack of a theory makes it more difficult to determine which data are relevant to the investigation at hand and which are of less im-portance.

It goes without saying that formal grammar instead sets as its goal the con-struction of a theory of language (not languages). A formal grammarian is more or less interested in knowing how the building blocks of language are assem-bled to form its structure. It is fair to say that rules are of primary importance: a linguist seeks "an explanation for the general process of projection by which speakers extend their limited linguistic experience to new and immediately ac-ceptable forms" (Chomsky 1955/1975: 519). Because rules rule, the building blocks are assumed, without much empirical evidence, to be the same across all languages. As a consequence, not all data are treated as equally relevant; the truly relevant data are those that allow the analyst to test his or her favorite theory. Under the best of circumstances, this can result in the useful stream-lining of the empirical investigation to include only those data points that are absolutely necessary to the analysis. For example, it may not really be neces-sary to take into consideration all imaginable influences of discourse context in the discussion of the purely structural properties of a particular syntactic construction. Under the worst of circumstances, such an approach runs the risk of potential oversanitization of what may be a more complex data set than the

analyst would prefer to admit – and this then becomes the source of criticisms from the side of typology that formal analyses do not take into account the full range of relevant data.

Formal assumptions about the crosslinguistic uniformity of linguistic building blocks thus make typologists very uncomfortable, as they are very concerned about the notion of engineering from sparse parts, not all of which appear comparable across languages. Another sign of typology's preoccupation with building blocks is its long-standing interest in categorization and classification. But this preoccupation with building blocks likewise comes at a cost. It often leads to an enterprise in classification, and an overemphasis on classification can easily turn into a case of overclassification, as when stative predicates are classified differently solely on the basis of whether they are suppletive or not, or underclassification, as when classificatory schemes of verbal complementation options fail to distinguish predicates that involve control from those that do not. Merely classifying types of expressions into categories does not necessarily solve the underlying analytical problem. However, classificatory schemes cannot replace the understanding of underlying mechanisms – this has long been recognized in biology, and linguists would be wise to follow suit.

An interesting consequence of these different approaches to data lies in the way the relevant data are elicited. Much has been written about typologists' extreme reliance on grammars (including Baker & McCloskey 2007). This reliance points to another difference, namely that between a reliance on naturally occurring data (in typology and functionalism) versus controlled elicitations, often unnatural (in formal grammar). The analogy could be drawn from physiology: one can observe a number of people in natural running environments, or test a set of subjects on a treadmill in a lab. In those two conditions, the generalizations are different: natural observations would yield generalizations about preferred patterns, treadmill studies would show what a human body can do when pushed to its limits. Physiologists seldom argue whether one method of observation is better than the others – they have long learned how to combine the data from both. Linguists are not yet at that stage.

3.   Theory: Too much, too little, and how much is just right?

In reality, typologists and generative grammarians have not exactly practiced fellowship with each other; in fact, the two enterprises have run largely on separate, parallel tracks, (for the most part) independently of each other for many years now. As a result, it does not seem at this point in history that the divisions between the two are any more permeable than they were a generation ago. Why is this the case? In our opinion, the main reasons for this lack of communication are socio-political, not intellectual.

At the risk of oversimplification, one can say that the default assumption of the generative approach is that "structure rules", and that the goal of the enterprise therefore consists of uncovering and formalizing that structure. This leads both to a preference for structural over other types of analysis (i.e., semantic, pragmatic, or processing analyses), as well as to the tacit assumption that characterizing a particular linguistic phenomenon in terms of its underlying phrase structure in itself constitutes an explanation. By attempting to capture all linguistic phenomena with one structural net, generative grammar may indeed be casting that structural net too wide, drawing in too many fish that it will eventually have to toss back into the murky non-structural waters anyway, and in the process risking tears in its structural nets. In other less allegorical words, when linguistic phenomena that could otherwise best be handled in semantic or processing terms are drawn in as relevant data for structural analysis, theory construction suffers. In attempting to account for phenomena they have no business accounting for, theories of phrase structural analysis become encumbered with unwieldy data that at best cause distortions in the theory and at worst cause it to break down altogether. The result is thus all too often overly complex theories that could be rendered much simpler and more elegant if they weren't trying to overachieve in accounting for too much.

The danger that lies in this approach is that, as linguists of all persuasions know, overly complex theories of language can't be learned, and therefore have to be innate. There's nothing wrong with that in and of itself, and it may indeed turn out to be the case. But if a particular structural analysis of language is overly complex and therefore unlearnable simply because it's trying to account for more than it was designed to cope with in the first place, then the logical chain of inference fails. If one wants to argue that a particular analysis of language is genetically encoded and neurologically engraved, then it behooves one to make sure that that analysis is empirically grounded. If such empirical grounding is missing, the result may be profoundly misleading, yielding too much structure motivated by nothing other than the desire to reduce language to phrase structure operations. We believe that it is much more helpful (and intellectually honest) not to assume that phrase structure can account for everything, and to determine the limits of structure versus non-structural phenomena such as discourse or processing. The challenge is that in an articulated theory, be it that of the Minimalist Program, LFG, or HPSG, it is rather too easy to create a necessary structure. It is imperative that linguists make sure that the structural urge does not become a goal in and of itself.

This is where typologists may have something of relevance to offer. First, as we mentioned above, the typological approach makes crucial appeal to ways in which languages differ, thus complementing an approach whose main concern is the ways in which languages are inherently similar. In our view, nowhere has this appeal to diversity been more productive than in phonology. As a result,

phonology has long been inherently typological, without any of the tensions found in syntax or morphology (see Hyman 2007). Second, typologists have long been interested in relating linguistic phenomena to phenomena beyond language, whether these be communicative needs (probably one of the most popular explanations in current functionalism and typology), cognitive effects, or social factors. The absence of a unified theory and entrenched formalism has sometimes been liberating to typologists, allowing them to come up with genuine crosslinguistic generalizations that challenge existing theories for an adequate explanation.

Two examples of such generalizations come to mind: headedness and the Accessibility Hierarchy. The headedness generalization is quite robust: languages TEND to avoid arbitrary combinations of different word orders and TEND to linearize their heads in a consistent fashion. The recognition of this tendency has played a major role even in generative analyses, which usually adhere to categorical primitives. Most notably, headedness figured prominently in the development of the DP hypothesis (Abney 1987 and many others), which allowed linguists to see that languages are even more consistent in terms of headedness than seemed to be the case in the days of NP structure. Despite the empirical validity of the phenomenon, a full explanation of headedness is still beyond the reach of either orientation.

The well-known Accessibility Hierarchy (Keenan & Comrie 1977) is another example: the ease of relative clause formation depends on the grammatical function of the head noun inside the relative clause, and all languages are expected to relativize subjects. The hierarchy also surfaces in other grammatical phenomena, for example in the interpretation of anaphors, which are also more likely to select a subject antecedent than a term lower on the scale. Why the preference for subjects? The original explanation, proposed by Keenan & Comrie, was that the referent of the subject is most salient and hence easier to access, and thus ultimately an effect of processing. While this explanation is rather vague, it has been confirmed by several studies of relative clause processing in languages as diverse as English (King & Just 1991, and many others), Japanese (Miyamoto & Nakamura 2003), and Korean (Kwon et al. 2004, 2006). However, psycholinguists have now been placed in the strange position of providing processing evidence for a phenomenon that was originally attributed, if only vaguely, to processing – an obvious case of circularity. Regardless of the robustness of the Accessibility Hierarchy as a language universal, it thus remains largely unexplained.

These are perhaps the best known examples of genuine typological discoveries that have had a major impact on the entire field: no linguist, regardless of persuasion, can willfully choose to ignore either one. However, typologically inclined linguists have produced many other descriptive accounts of equally rich and intriguing data that would, if recognized, present challenges to any

linguistic approach, and could perhaps stimulate thought leading to scientific advancement. The sad fact is that since typologists and formalists tend not to talk to each other (or read each other's literature), many of these veritable riches remain buried in descriptive grammars such as those in the Mouton Grammar Library series.

While typology (at least in its functional instantiation) has done its best to consciously ignore generative grammar, much of typological research has nonetheless unconsciously been driven by the generative engine – only in the opposite direction. In much the same way as the injunction "Don't think of a blue snowman" invariably conjures up the very image it proscribes, typological research has by way of reaction to the purportedly misguided generative emphasis on structure become equally obsessed with structure in a negative sense, namely with demonstrating that the structures proposed by generative analyses can't possibly be right. In this way, typology has in many ways become bogged down in trying to prove that certain linguistic phenomena CAN'T be structural in nature. There is of course value in this, in that by helping to peel away phenomena that DON'T need to be accounted for by structural theories, functional typologists could be making a valuable contribution in helping to constrain the construction of said theories. However, the true potential of this contribution is lost if the theory constructor isn't listening in the first place, because the feedback tends to come in the form of: "I bet you can't come up with a structural analysis for this!", or "Look at this, THIS can't be structural!" The same is true from the opposite end of the spectrum. If formal grammarians similarly throw down the gauntlet by issuing challenges of the type "You can't possibly account for this particular crosslinguistic structural principle by analyzing individual grammars", little progress will be made in the field as a whole. Such naysaying leaves us with the rather bleak prospect of a downward spiraling dysfunctional relationship that is of ultimate benefit to neither of the parties involved, on which more below.

4.   A common challenge?

So far, our lugubrious observations point to a sadly fragmented field, where one orientation refrains from pushing for deeper generalizations, while the other desperately tries to derive every observable phenomenon from structural principles. Typologists are sometimes accused, and wrongly so, of ignoring structure altogether (see Nichols 2007 for a discussion) or of an inability to look beyond discourse; theorists are often portrayed as interested only in arcane, extremely "unnatural" structures, which are intended to test the limits of human language potential but on occasion test the limits of human working memory capacity or even mere conceptual complexity instead – long sentences like (1a) and (1b) are good examples:

(1)   a.   *What political figure did she venture one might begrudgingly respect without particularly liking?*

        b.   *Which Nobel prizes did you wonder how many people would eventually be awarded?*

One of the proposed solutions (see Baker & McCloskey 2007) to the fragmentation problem involves changing the methodology of typology in particular in such a way that both orientations can interact in a more productive fashion. The proposed change is a so-called "middle way" that would allow the comparison of a relatively small, intelligently selected sample of languages, using deeper structural analyses than is currently possible with large-scale sampling methods. Another change of this type would involve comparative investigation of closely related languages. A good illustration of such an approach comes from comparative Romance linguistics, since the early 1970s, when work by Richard Kayne and his students, comparing and contrasting French, Italian, and Spanish, helped create a key testing ground for research on language variation. Comparative Romance has demonstrated the enormous benefits of in-depth research on closely related languages and dialects. Such research allows one to uncover subtle distinctions and fine details of grammar that often remain unnoticed in a coarse-grained approach to language typology (see Comrie 1993 for similar remarks).

We wholeheartedly agree with the idea of the "middle way" – in our opinion, this is an important step in changing the methodology of crosslinguistic investigations. This change, if it were to be implemented, would not be painless, however. First and foremost, it sounds more like an invitation to typologists to participate in an enterprise on the opposing turf, much like the Republican Party of the early twenty first century setting the political agenda in Washington to which the Democratic Party must then figure out how to respond. Given the general reactive stance of typology vis-à-vis formal theory discussed in Section 3, this invitation could easily have the exact opposite effect, i.e., encourage typologists to stick to their guns, possibly leading to an increase rather than a decline in large-scale enterprises.

Without abandoning the useful idea of adjusting sampling methodology, we would also like to propose a more fundamental change in mindset, one that would allow practitioners of both orientations to meet on neutral ground, a disciplinary demilitarized zone of sorts. The starting point of this proposal is quite simple: we need to stop pretending that linguistics is mathematics or physics, which has long been the underlying desire of many formal grammarians, and at least entertain the notion that language may operate like other natural systems. If so, linguistics has a lot to learn from biology. Biology has long since moved beyond classificatory schemes that have little to say about the underlying mechanisms of natural systems, and this carries an important lesson for

typology. But biology has also moved beyond the idea that knowing how individual parts of an organism are assembled at various levels of description – e.g., molecules, cells, systems, organs, etc. – is enough to understand the complexity of that organism, a lesson for formal grammar. In order to understand how natural language works, it is worth considering whether it might better be assessed as an entire system, much in the way that biology has learned to study the entirety of interactions at various levels of the organism. This is where subfields like neurolinguistics and computational linguistics can be of service: neural imaging techniques allow us to look at the neural composite of interactions at all levels of linguistic analysis, and computational models provide us with the means to determine how those interactions can arise to create composite patterns at the systems level (e.g., Kirby 1999, van Everbroeck 2003). Even within linguistics proper, we should be taking all available data sources into account in constructing our theories of language: not just principles of structure building, but their processing correlates and functional properties as well.

The bad news is that continuing to base our linguistic inquiry on partial data sets (derived from introspection, observation of limited though naturally occurring data, incomplete elicitation of minimal pairs, etc.), is more likely than not an exercise in inevitable obsolescence, planned or unplanned. Otherwise, we seem doomed to continue along the path of scholastic disputes over insufficient albeit preferred data. The good news, on the other hand, is that many of the components of such an enterprise are already in place: formalists are good at deducing principles of structure building, while typologists are good at recognizing their functional properties.

One approach within typology that moves in this direction is that pursued by Hawkins in various publications (Hawkins 2004 and references therein). Hawkins proposes quantifiable and falsifiable hypotheses about why languages exhibit the structural properties that they do, and how those structures might relate to facts of language processing. There is thus no avoidance of explicit theorizing dependent on phrase structural configurations, but that theorizing is not invoked merely in the service of structure *qua* structure; instead, Hawkins makes attempts to relate what we can find out about structure from large sampling to what we know about language processing from numerous experimental studies – and suggests further possibilities for experimental validation of the theory in the process. This approach truly offers a synthesis of the best of both worlds. In other words, typology and theory construction can indeed coexist to good effect.

5. By way of conclusion

In one sense, the challenge faced by typology and formal grammar is essentially the same: both can choose to step boldly into the twenty first century by

forging connections with specialists in sister disciplines like psychology, cognitive neuroscience, and computer science, or they can choose to run the risk of being relegated to history and (re)subsumed by the humanities. Typologists and formal grammarians alike can take fair warning from the fate of philology as a field of study in the past century. While no one disputes the brilliant insights and tremendous linguistic progress made by the *Junggrammatiker* in the nineteenth century, the sad fact remains that the results of all that exciting progress are now only taught in our very own departments under the rubrics of historical linguistics and history of linguistics.

This is a common challenge faced by linguists of all stripes. If the mindset of the field as a whole doesn't change, debates such as those between typologists and formalists will continue to have religious rather than scholarly overtones. The choice is ours. If we don't actively seek convergence – which means that everyone has to compromise to some degree – the whole field of linguistics could easily implode on itself. In that case, the niceties of distinction between what used to be two main orientations in the field, functional-typological and formal – as well as our own internal and somewhat parochial debates over implicational universals and derivation by phase – would unfortunately be lost to posterity anyway.

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