WHAT ARE PARAMETERS?
A REPLY TO SCHULTE-NAFEH & DUSSIAS

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1. Introduction

Martha Schulte-Nafeh and Paola Dussias provide an excellent discussion of the parameter theory of syntactic development, using the null subject parameter as a case-study. They are most concerned with the question of the initial setting: Do children start with the assumption that the target language will allow null subjects in tensed clauses, as in Italian (e.g., Hyams, 1986) or with the assumption that overt subjects are obligatory in tensed clauses, as in English (e.g., Bloom, 1993)? Or are both settings of the null subject parameter initially available to the child, as proposed by Valian (1990)?

Rather than defend my own position on this issue, I want to use this reply to focus on the broader question of the status of parameters. What precisely are they? It is often assumed that parameters are part of a distinct language acquisition device (LAD) that interfaces with Universal Grammar (UG); they are the "switches" through which universal principles are instantiated. These innate parameters, although triggered by simple properties of the input, are linked to deep grammatical properties, and thus the switching of one parameter (perhaps on the basis of just a single triggering sentence) can cause the child to deduce a range of superficially different properties of the target language.

2. Problems with the Standard Conception of Parameters

This is an attractive view, but implausible for many reasons. Consider first the issue of initial settings, the notion that there exists a single setting of each parameter that the child starts with, corresponding to the grammars of only some languages. This entails that some languages are more "natural" than others, since they correspond to the child's initial state. For instance, under Hyams' theory, English can be acquired only through positive evidence, while Italian is the null hypothesis; under my own account, the converse is true. If parameters are part of an innate LAD, this is an odd state of affairs. Why should humans have evolved an innate preferred ordering of natural languages? If Italian-type grammars (or English-type grammars) are not the first choice of a child exposed to some input, then why do they exist at all? Despite other difficulties, one of the attractions of Valian's alternative is that it avoids this problem, as it does not assume that one grammar is innately favored over another.

There is a more general concern. From a biological standpoint--one informed by evolutionary theory--considerations of function are paramount. Complex biological capacities evolve through natural selection, and if an LAD with parametric-switches is part of our genetic endowment, it is reasonable to ask what it is *for*. The answer is not obvious. One might be tempted to argue that an LAD is essential in order for children to come to possess language, a capacity which is of obvious selective advantage for a social organism (for discussion, see Pinker and Bloom, 1990). But this is probably false. At least in contemporary humans, linguistic knowledge can emerge in the absence of linguistic input. For instance, children exposed to non-linguistic communication systems (pidgins) nevertheless come to acquire (through the process of creolization) systems of syntax, morphology, and phonology fully consistent with UG. Given this, there would seem to be no selective pressure for the evolution of parameters or any other

aspect of LAD, since we can come to possess language without it. UG and other, non-linguistic, capacities may be sufficient.

One might argue that parameters are necessary to acquire *specific* languages. For instance, given that the environment could contain either English or Italian, the human child must be equipped to acquire both, and thus the null subject parameter has evolved to perform this task. But this just pushes the question back--why do there exist different languages in the first place? Languages were not present prior to the existence of humans; they are not properties of the environment that hominids have had to evolve in response to. Instead, they are the result of our own capacities; the environment has English and Italian *just because* humans are equipped to acquire and use such languages, and thus one cannot explain the existence of the LAD by appealing to the prior existence of English and Italian. Thus the problem arises again: Why did humans come to possess the capacity to acquire different languages? Put differently, given that our species has evolved a largely innate communication system (as did other species, such as vervet monkeys), why isn't there just a single language shared by all humans?

3. The Status of Parameters

There is an alternative perspective, discussed briefly in Pinker and Bloom (in press), which is that an innate capacity for language (UG) has evolved through natural selection, for the purpose of communication--but that humans have never evolved an LAD; more specifically, we have never evolved parameters or parameter-setting mechanisms. Languages differ, of course. English has obligatory subjects in tensed matrix clauses, Italian does not; English is SVO, Japanese is not. But these differences might exist only because properties such as subject omission and word order *are learnable through cognitive mechanisms that were present prior to the evolution of language.* Given the existence of these cognitive mechanisms, there would have been no selective pressure for the human language faculty to evolve a uniform condition on subject usage, or a single innate word order, and such aspects of grammar are free to vary. In other words, languages vary in just those ways that are learnable through other means, because in these domains there is no selective pressure for anything to become hard-wired.

In the case of null subjects, for instance, it would be mistaken to say that humans have evolved a parameter for the special purpose of acquiring languages that have either obligatory overt subjects or optional overt subjects. Instead, humans have evolved an innate grammar that *doesn't care one way or another.* This property of language is sufficiently superficial that it did not have to be hard-wired; we can determine whether or not null subjects exist through non-linguistic cognitive mechanisms and thus this property of language is not part of UG. It is free to vary, and, as a result, some languages have null subjects and others do not.

To put it slightly differently, UG and the LAD are abstract characterizations of the computational mechanisms and representational systems that subserve the acquisition and use of language. Parameters of variation, and the learning processes that fix their values for a particular language, are not individual, explicit gadgets in the human mind--it is impossible to imagine selective pressures for such gadgets. Instead, they fall out of the interaction between the basic underlying organization of language (UG), and nonlinguistic learning mechanisms that can be sensitive to surface variation in the entities defined by UG. Syntax acquisition (or "parameter-setting") is the combination of the linguistic representations that are part of UG (the "principles") and the non-linguistic mechanisms (the "parameters") that are sensitive to variation in the input.

4. Implications

The above characterization of parameters has some non-trivial consequences for the study of syntactic development, such as:

Limitation of variation to superficial properties. The evolved capacity for language sets the "blueprint" for natural language; variation exists only in the domains that can be learned through simple input. One implication of this is that the loci of variation should not themselves be linked to deep properties of grammar. Schulte-Nafeh and Dussias correctly note that if one restricts the import of the null subject parameter to describing surface differences between languages (such as the presence or absence of subjects), it would defeat the goal of using parametric variation to

capture "deep" differences between languages. But if the analysis above is correct, this goal is itself misguided, and no such differences exist. Note that this is also the conclusion of those scholars who propose that all variation is in the lexicon. Though the view itself is implausible (consider word order differences, for example), its motivation, which is to limit the scope of cross-linguistic differences, is quite reasonable. As argued above, properties like subject omission and word order might vary across languages *just because* they are unrelated to abstract unlearnable properties of language and are thus "invisible" from the standpoint of the evolution of the language faculty.

<u>Acquisition mechanisms are not special to language</u>. Language acquisition involves representations and constraints that are special to language, but the transitional mechanisms that allow children to learn specific properties of the target language do not. They could include procedures and mechanisms--such as learning the order of items in a temporal string, recording relative frequencies, making generalizations on the basis of positive evidence--that are exploited in other areas where knowledge acquisition must take place, such as learning about objects and animals in the physical environment. As such, limiting explanation of syntactic development to instances of "triggering" might serve as a provocative idealization, but it most likely seriously underestimates the capacities available to the child in the course of language acquisition.

This has some consequences for the core question that Schulte-Nafeh and Dussias deal with--the nature of the child's default hypothesis. Note that the problem has now been redescribed; it is no longer "what is the initial setting of the null subject parameter, which is part of LAD?" Instead, it is "given that UG does not specify whether subjects need to be overt, how does the child use non-linguistic learning mechanisms to learn this?" And this shift in perspective motivates us to explore the issue in a very different way. For instance, we are less likely to look for the answer in terms of a subtle relationship between null subjects and inflectional morphology and more likely to focus on the sorts of hypothesis-testing mechanisms discussed in Valian (1990) or the punctate triggering event proposed in Bloom (1993). According to both Valian and myself, however, the null subject parameter has little (perhaps nothing) to do with the acquisition of other aspects of the grammar, and thus the details of the transition process may be of little interest per se for the study of UG. This is, of course, an open question, and will ultimately be resolved through future studies of the acquisition and representation of null subjects.

Schulte-Nafeh and Dussias conclude their paper on an optimistic note about the prospects of parameter theory. This optimism is quite reasonable. Regardless of whether parameters are part of an LAD, or whether they are distinct non-linguistic mechanisms, the study of parameter setting could reveal a great deal about language, non-linguistic cognition, and the mechanisms of developmental change.

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