On the poverty of the challenge

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Abstract

Positive data involving auxiliary fronting are never evidence for a constraint such as the structure-dependent hypothesis. At best, positive data of any complexity are direct evidence for a simple-minded hypothesis, of the sort of 'front the first auxiliary (after something or other)'. On the widespread assumption that negative data are generally unavailable to children learning language, a serious empiricist alternative to the rationalist view that linguistic structure is partly innate would have to show how the correct hypothesis ('front the matrix auxiliary') is induced from mere extensions from positive data. But this does not seem possible.

In their criticism of poverty of the stimulus arguments, Pullum and Scholz (P&S) do not seem to appreciate the full significance of what they call an 'interesting point' due to Freidin (1991: 618–619), which may be why they also decide to ignore it (cf. P&S Section 4.4: 38). Freidin's observation arises with regards to sentences like (1b) (their (21d)), to be generally contrasted with (1a):

(1) a. *Is the dog hungry?*
     b. *Is the dog that is in the corner hungry?*

At stake is how a child can acquire knowledge of auxiliary fronting in a language like English, and whether this knowledge can be inferred from available positive data. Two hypotheses that the child might consider for this task (before having encountered (1b)) would be A and B:

(2) A. Front the first auxiliary.
     B. Front the auxiliary in the matrix Infl.

The child hypothesizing A need not know much about English (or language in general), other than the fact that *is* in (1) counts as an auxiliary. However, the

child hypothesizing B must somehow know what matrix Infl is, thus ignoring an auxiliary inside the specifier/subject of that Infl, such as the first *is* in (1b). That is, such a child must have a fair amount of prior knowledge about the structure of sentences.

When Chomsky first constructed that scenario, he claimed that sentences that would serve for the child to infer hypothesis B (obviously the more adequate one) are exotic. Chomsky thus found motivation for the rationalist claim that the child already comes equipped with whatever knowledge is necessary to determine B prior to exposure to data. Freidin's point amounts to recognizing that Chomsky may have been too generous with the empiricist alternative he was arguing against: Not even the fact that (1b) is grammatical proves that something with the effect of hypothesis B is correct (and the only possibility), hence does not lead to adult knowledge of English. More generally, no amount of positive evidence, 'exotic' or not, would suffice. The poverty of the stimulus is thus extreme.[1]

Given the truism that the large majority of questions in any given corpus of English front the first auxiliary, it would be reasonable to conclude, on statistical grounds, that hypothesis A is the rule to be learned. There are connectionist networks that would learn just that 'variety' of English from simple exposure to data. If statistical weight is disregarded, the grammaticality of (1b) would at least force a learner with no prior knowledge of language to extend the initial hypothesis, perhaps along the lines in (3):

(3)   C.   Front any auxiliary.
       D.   Front any finite auxiliary.

These formulations would allow both (1a) and (1b), as P&S themselves mention. Of course, these formulations would also allow abominations like (4):

(4)   *Is the dog that in the corner is hungry?*

The question here, as in much of the literature cited by P&S, is how the learner comes to know that any hypothesis permitting (4) is incorrect. Even if (1b) is available to the child as evidence, that falls short of motivating a process like B (which would correctly exclude (4)), since there are numerous other compatible possibilities.

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1. P&S, citing Sampson, attempt to argue against this extreme form of the POS argument. If, according to the linguist, there is no relevant evidence available to the child that *F* is a fact of language *L*, how does that linguist know that *F* is a fact? According to Sampson, the argument for (extreme) POS is thus self-contradictory and refutes itself. We are bewildered by this 'argument'. Obviously, the linguist can discover that *F* is a fact just the way that scientists generally discover facts – by performing experiments. In this case, by constructing the hypothesized ungrammatical sentence (possibly one that had never before been constructed) and collecting native speaker judgments on it. There is no self-contradiction or self-refutation.

For example, (5) enumerates one further class of hypotheses, beyond those in (3), that might be triggered by (1b):

(5) E. Front the first auxiliary (that comes after an intonation change).
     F. Front the first auxiliary (that comes after the first complete constituent).
     G. Front the first auxiliary (that comes after the first semantic unit you parsed).

These are rule schemata with a marked case and an elsewhere condition. If the context in the parentheses is met, then the rule is sensitive to it; otherwise, the parenthetical is ignored. We are trying to avoid using notions like 'subject' or Infl in the parentheses. We thus cue the rule to phonological (E), syntactic (F), or semantic information (G) which is conceivably abstractable from the data. Perhaps different learners are sensitive to each of these aspects of the data, depending on their various talents.

A child could correctly analyze most sentences in terms of (5). However, consider (6):

(6) *Will those who are coming and those who are not coming raise their hands?*

Learners using the strategies in (5) should be very puzzled, having expected (7):

(7) **Are those who are coming and those who not coming will raise their hands?*

Some of those learners may have produced (7), which they could eliminate from their English only through negative data – which is widely assumed to be unavailable to learners. Those who are lucky enough to have heard (6) may come up with more and more bizarre hypotheses along lines similar to those in (5).

In sum, P&S are missing Freidin's point: (1b) is not *direct* evidence for anything with the effects of hypothesis B. At best, (1b) is evidence for something with the logical structure of 'A or X', but certainly not for anything having to do with B, implying such notions as Infl and matrix clause (or, another possibility suggested by Freidin, the Head Movement Constraint). Being compatible with hypotheses A or B does not mean providing the elements to form either hypothesis. Crucially for the issue at hand, a learner needs more to acquire hypothesis B.

The poverty of the stimulus argument is based on a rational conjecture: that children come equipped with a priori knowledge of language just because it is

unimaginable how they could otherwise acquire the complexities of adult language. For the empiricist approach to be considered a scientific alternative, it owes us the very first step: to show precisely how, starting with no assumptions about the organization of the grammar, hypothesis B (or something with similar effects) is inferred by a learner on the basis of mere positive data. Meanwhile it is pointless to engage in mathematical analyses of part of the data. What could that possibly decide if there is only one theory under scrutiny?

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Reference

Freidin, Robert (1991). Linguistic theory and language acquisition: A note on structure-dependence. *Behavioral and Brain Sciences* 14: 618–619.