

TOPIC...COMMENT

Formal Linguistics Meets the Boojum

I try not to take things too seriously. I am normally able to laugh at things that would be prime candidates for the weeping, wailing, and gnashing of teeth department if my sense of the ridiculous were suddenly amputated. But there is one thing that oppresses my soul in the current linguistics scene; one stomach-gnawing phobia that causes me to wake up and go downstairs and pad about in the small hours of the morning. I want to share it with you. Perhaps the sharing will exorcise the fear — though this is relatively unlikely, because there is so much good evidence that I am right to be afraid.

My fear is that formal linguistics in the true sense will disappear from our profession completely, in the USA and probably the entire world, hence the whole solar system and perhaps the cosmos. Not just recede from some position of dominance in the wider field (it has none), but actually disappear — conferences, journals, intellectual community and all.

The Baker in Lewis Carroll's *The Hunting of the Snark* feared that if he ever met a boojum he would just "softly and suddenly vanish away, and never be met with again," and attentive Lewis Carroll readers will recall that despite the confidence-inspiring leadership of the Bellman (the Chomsky figure in the poem, I always feel), the Baker's fears were not the least bit unjustified. Nor are mine, I believe.

Of course, one thing there is no danger of is the disappearance of the word 'formal'. Part of the problem is that a word can survive the erosion and eventual loss of its referent; think of the word 'equal' in Orwell's *Animal Farm*, or the word 'defense' since 1945. Just because there is a West Coast Conference on Formal Linguistics each year does not guarantee that formal work will survive, any more than the existence of Democratic People's Republics guarantees that democracy will survive.

I do recognize that to take the notion 'formal' in linguistics as rigidly as it is standardly taken in mathematics and logic would be to risk eliminating formal linguistics immediately, since no work yet done would count as instantiating it. The criteria for formal theories set out in logic books are stringent, and doubtless, nothing in linguistics meets them at the level of detail.

But one can readily see which work in linguistics is making a concerted *effort* to meet them, as opposed to just tossing them aside. That will be sufficient to satisfy me that a given line of work can properly be called formal. Call me a softy, but I give marks for effort.

The formal linguistics I am referring to has languages and grammars as its objects of investigation, and its conduct involves the precise definition and testing of grammars and classes of grammars. The following three conditions (paraphrased from Robert R. Stoll, *Sets, Logic, and Axiomatic Theories*, W. H. Freeman, San Francisco, 1961, chapter 3) are non-negotiable, at least as statements of intent, for formal theories of grammar in the sense I intend.

- (I) The notion 'structural representation' must be effective. That is, there must be an algorithm for determining whether some arbitrary string, graph, or diagram counts as a structural representation according to the theory.
- (II) The notion of 'rule' (or 'principle' or 'law' or 'condition' or 'constraint' or 'filter' or whatever) must be effective. That is, there must be an algorithm for determining whether some arbitrary string, graph, or diagram is a rule (or 'principle' or 'law' ...) according to the theory.
- (III) The notion 'generates' (or 'admits' or 'licenses' or whatever) must be effective. That is, there must be an algorithm for determining whether some arbitrary structural representation is generated (or admitted or licensed ...) by a given set of rules (or 'principles' or 'laws' ...).

The extent to which most of today's "generative grammar" enthusiasts have abandoned any aspiration to a formal orientation in the above sense can only be described as utter. Consider the state of phonology, for example. Even the best friends of the nonlinear phonology that has driven the relatively formal pre-1977-style segmental phonology into the wilderness (and I am an affectionate acquaintance) will admit that it isn't trying to meet the conditions set out above for formal theories. True, a very significant outpouring of new ideas and new diagrammatic ways of attempting to express them has sprung up over the past decade; but it is quite clear that at the moment no one can say even in rough outline what a phonological representation comprises, using some exactly specified theoretical language. Nor is there much sign of published work that even addresses the issues involved in a serious way. Drifting this way and that in a sea of competing proposals for intuitively evaluated graphic representation does not constitute formal linguistic research, not even if interesting hunches about phonology are being tossed around in the process.

Yet phonologists have such good authority for heading in their present direction — the best, since Chomsky, still the most influential linguist in the world, has turned his face more and more sternly against formal work over the years, finally reaching the point of openly mocking it and counter-advocating it.

This latter assertion must be documented, because many will insist it is not so. After all, it was Chomsky who in 1957 issued what is still the finest and most cogent defense of the formalist position that linguistics has ever had:

Precisely constructed models for linguistic structure can play an important role, both negative and positive, in the process of discovery itself. By pushing a precise but inadequate formulation to an unacceptable conclusion, we can often expose the exact source of this inadequacy and, consequently, gain a deeper understanding of the linguistic data. More positively, a formalized theory may automatically provide solutions for many problems other than those for which it was explicitly designed. Obscure and intuition-bound notions can neither lead to absurd conclusions nor provide new and correct ones, and hence they fail to be useful in two important respects. I think that some of those linguists who have questioned the value of precise and technical development of linguistic theory have failed to recognize the productive potential in the method of rigorously stating a proposed theory and applying it strictly to linguistic material with no attempt to avoid unacceptable conclusions by *ad hoc* adjustments or loose formulation. [Noam Chomsky, *Syntactic Structures*, Mouton, The Hague, 1957, p. 5.]

Never was it better put, before or since. And as late as 1976, Chomsky would still speak in broadly approving terms of work that took seriously his 1957 recommendation; for example (from a January 1976 conversation later transcribed into a book):

I hope these studies [of formal properties of grammars and generative power] will continue to be pursued, as well as the mathematical investigation of transformational grammars. There has been some interesting recent work by Stanley Peters and Robert Ritchie on this latter topic. [*Language and Responsibility*, Pantheon, New York, 1979, p. 127.]

Peters and Ritchie's work gets the "interesting" accolade here. But by two or three years later, in 1978 and 1979 lectures, that "interesting" work, with its important consequences for generative grammatical theories, was downgraded to "seriously misinterpreted" [*Rules and Representations*, Basil Blackwell, Oxford, 1980, p. 122] and had permanently lost its status as "interesting".

By about 1979, a rhetorical program to sap the strength of Peters/Ritchie-style arguments had been put into effect: Chomsky came up with his zany "conclusion that only a finite number of core grammars are available in principle," which he claimed "has consequences for the mathematical investigation of generative power and learnability," namely that it "trivializes these investigations" [*Lectures on Government and Binding*, Foris, Dordrecht, 1981, p. 11].

At around the same time, Chomsky began an attack on the very idea of languages as formally specifiable objects, putting forth the view that grammars might "characterize languages that are not recursive or even not recursively enumerable, or even...not generate languages at all without supplementation from other faculties of mind." (No sense was

ever supplied to the notion of a grammar that is discovered and tested through language study but which does not characterize any language.)

And from this total change of direction, "nothing of much import would necessarily follow" [ibid., p. 13], according to Chomsky. Nothing of much import? Only the defining idealization of formal linguistics: the idea that languages are abstractly definable and can be studied in isolation from biological or biographical facts about their speakers. It may be a methodological fiction (like the idea that economic systems can be studied in isolation from the sometimes irrational spending behavior of actual people in actual shopping malls), but there is no formal linguistics without it.

Since 1979, Chomsky has steadily escalated the scorn level of his opposition to formal linguistics. In taped conversations from 1980 (fortunately, Chomsky has left almost as many taped conversations around as Nixon did) we find him being yet more dismissive about mathematical studies of generative capacity (for example: "the notion of weak generative capacity...has almost no linguistic significance" [*Noam Chomsky on the Generative Enterprise*, by R. Huybregts and H. van Riemsdijk, Foris, Dordrecht, 1982, p. 73]), and pooh-poohing the idea of making theories formally precise ("I do not see any point in formalizing for the sake of formalizing. You can always do that" [ibid., p. 101]), and speaking dismissively of learnability research ("it is hard to imagine many mathematical problems about the acquisition of systems of a finite class" [ibid., p. 112]).

By March 1981, speaking at the Royal Society in London, Chomsky was making similar points even more stridently. He asserted that in the light of his recent work, "most of the results of mathematical linguistics, which in any event have been seriously misinterpreted, become empirically virtually or completely empty" [*Philosophical Transactions of the Royal Society of London*, series B, 1981, p. 233]. In a written reply to a question submitted later, he spoke of "the meaninglessness of the question of generative capacity" [p. 277], described mathematical linguistics as "marginalized" [p. 280], and dismissed a point about parsability with a *reductio* to a silly view described as "no more serious than most of what appears in the literature with regard to the empirical significance of results in mathematical linguistics" [p. 278].

Five years later, worse than ever, we find Chomsky going so far as to say (about X-bar systems) that "there is no point in specifying one or another of the possible options in detail"; in particular, further formalization is pointless, since there are no theorems of any interest to be proved or hidden assumptions to be teased out in these systems" [*Barriers*, MIT Press, Cambridge, 1986, footnote 3].

Chomsky now flatly rejects his 1957 position, in other words. He *knows in advance* that there cannot be any point in formalizing his ideas. Forgotten are his claims of three decades before that “a formalized theory may automatically provide solutions for many problems other than those for which it was explicitly designed.” One is reminded of the anonymous premature epitaph once constructed for the British prime minister Lloyd George:

Count not his broken pledges as a crime:

He MEANT them, *HOW* he meant them — at the time.

Chomsky only meant his words how he meant them, it would seem. His contemporary work pays them not the slightest heed. Consider this total baffler, for example [from *Barriers*, p. 7]:

(12)

α is dominated by β only if it is dominated by every segment of β .

That’s right, in addition to an unresolved anaphoric *it* (for which I will assume subject control), this mumbo jumbo, apparently intended as a new definition of dominance, refers to dominance on *both sides*, the definiendum occurring in the definiens! It as if one said in a work on number theory that one was going to assume “ x is a prime factor of y only if x is a prime factor of every factor of y .” What does it *mean*? Only someone fully content to dismiss formalization as pointless could be so cavalier as to redefine something as fundamental as dominance without bothering to make the redefinition coherent.

To give Chomsky his due, one must note that he is completely consistent in his abandonment of formality and explicitness. He even makes it clear that he knows the passage in question may not be coherent as it stands; his nearby footnote 10 says defensively, “Formalization of this idea is fairly straightforward, requiring introduction of the notion of occurrence of a category.” Maybe that means something, maybe it doesn’t; but who cares? Remember, he has already warned the over-eager reader, seven footnotes earlier, that “further formalization is pointless.” So you can just put that pencil down, understand?

The conclusion I draw from the casually bungled definitions in *Barriers* (and the crucial definitions in nearly all current work by Chomsky’s co-enthusiasts) is that those syntacticians who are close followers of MIT work are not likely to be the ones who will keep formal linguistics alive. Government-binding syntax (or principles-and-parameters syntax; who cares, it’s only words) no longer makes any pretense at being formally intelligible. It is set to develop into a gentle, vague, cuddly sort of linguistics that will sit very well with the opponents of generative grammar if they compromise just enough to learn a little easy descriptive vocabulary and some casually deployed

and loosely understood labelled bracketing for which no one will be held accountable.

It is ironic that the people doing GB work are sometimes opposed for being 'formalist' or 'generativist' when in truth they are nothing of the sort. Those linguists who decided long ago that generative grammar was something they were opposed to should look again; they will find that what they disliked, including not only the algebraic tools but even the conceptual separation of languages from people, has dissolved away.

There are many separate subcommunities, of course, among these opponents — the members of the linguistic profession who would typically reject labels like 'generative' or 'formal' as applied to their own work. There are anthropological linguists and articulatory phoneticians and correlational sociolinguists and acquisition specialists and conversational analysts and lexical semanticists and classical philologists and literary stylisticians and language planners and worldspak proponents and TESOL practitioners and all manner of worthy people. But a particularly relevant subgroup among them consists of those syntacticians who are referred to by cruel people at UCLA as the Fuzzies. (This is a wholly unfair designation, which I utterly condemn, but will continue to use out of laziness and a certain lack of moral fiber. It may in fact be kinder than some other names in use. I recently learned that some Northern California linguists call them "Flat-Earth Functionalists.")

The Fuzzies believe that the important directions in grammatical research at the moment are things like cohesion and information structuring in discourse, the different flows of information in written and spoken language, the use of different sentence types in different situational contexts, the influence of the communicative function of language on sentence structure, and stuff like that.

I have no antipathy toward such work; it can be mildly interesting (not that a slow Sunday at a BLS meeting may not sometimes be a bit yawn-inducing). But it is not giving rise to any formal linguistics, and it is not likely to. How passives are structured into phrases or grammatical relation networks and associated with denotational meaning in a language is something I think there can be a formal account of, but the same is not true of how much more likely it is that a passive rather than an active will occur in a particular discourse context given a certain degree of agency of the predicate, a certain text frequency of the verb, and a given level of author's empathy with the protagonist.

What no one seems to have fully appreciated is that *current MIT syntax will blend very nicely with the work of the Fuzzies*. And the

resultant amalgam will be unstoppable. Students of the early 1990's, I predict, will write dissertations on topics like how point of view of participants affects relative strength of barriers, and their mixed GB/Fuzzy thesis committees will be delighted. An invincible coalition will have emerged: the anti-formalists in pursuit of the unformalizable.

It will be the death knell for formal linguistics *sensu stricto*. I see the few formal linguists who survive, slightly crazed as a result of isolation and inbreeding, taking to the hills in places like Montana and northern Idaho, like the groups of white racist loonies who fondly imagine they are the last hope of the United States. Occasionally one will read of a heavily armed FBI team shooting it out in a siege of a fortified formalist farmhouse, and mainstream linguists, pausing amid their work of unifying θ -roles with cognitive stereotypes, will say: "Are those crazies still out there?"

Perhaps sometimes a lonely old madman with stringy grey hair and wild eyes will be found seizing people by the arm at an LSA meeting and haranguing them about precise definitions of formal underpinnings, until he is taken away by hotel security people.

Soon there will be no one left in linguistics who knows what an ordered pair is, or when you spell *if* with a double *f*, and no one will have any idea what the consequences of their theories or the denotations of their diagrams are, or what it means to have an interpretation for a notation . . . The whole revolution in linguistics that Bloch and Harris prepared us for and that *Syntactic Structures* ushered in "will softly and suddenly vanish away."

'It is this, it is this—' 'We have had that before!'
The Bellman indignantly said.
And the Baker replied, 'Let me say it once more.
It is this, it is this that I dread!'

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Note

The views expressed in TOPIC . . . COMMENT are those of the author. They should not be construed as representing either the editor or the publisher of *NLLT*.