Poverty of the Stimulus: Part 3, Non-Nativists

“Angelina Jolie” has at least three meanings: (1) the name of an actress; (2) any beautiful woman; or (3) any unattractive woman.

The past two posts have looked at the poverty of stimulus argument. Post 1 (here) showed how Chomsky used it to overthrow Skinner’s operant-conditioning based theory of language learning. Post 2 (here) explained why I argue on this blog that while the poverty of the stimulus argument destroys Skinner, it does not mean that Chomsky’s defense of an innate, universal grammar (UG) is required.

In this post I want to look at an alternate empiricist response to Chomsky. In an earlier post I wrote about the spontaneous creation of tools by a form of crow, and what this might imply about speech and motivation. (See: Motivation and Speech)

The post inspired a lively exchange. Commenter Raymondw said in part:

What Bird and Emery have demonstrated, as has been demonstrated thousands and thousands of times, is the power of operant conditioning as a learning tool in most species of life.

And I replied:
Babel’s Dawn Post: The Poverty of the Stimulus: Part 3, Non-Nativists

I'm not sure what in the abstract leads to the suspicion that operant conditioning was used, unless one argues that everything done by anyone at any time is the result of operant conditioning. That was the doctrine Chomsky exploded 50+ years ago.

And Raymondw responded (in part):

it is highly arguable that Chomsky exploded anything. It has never been experimentally demonstrated that operant conditioning is not the basis for language learning. All Chomsky did is argue verbally in a way that convinced many people that operant conditioning couldn't be the basis for language learning. Let's clear about this. This isn't an issue of competing ideologies but of empirical fact.

Well, that woke me up.

The remark led to further exchanges and my request that Raymondw provide some sources that challenge the “poverty of the stimulus” argument. And he did, especially putting emphasis on the work of Geoffrey K. Pullum so I read a recent piece by him and Barbara C. Scholz, a chapter titled “Irrational Nativist Exuberance” (here) from a book, Contemporary Debates in Cognitive Science. It is true that Pullum rejects the poverty of the stimulus argument recounted in the first post, but he is not a defender of Skinner’s stimulus-response theory either. He says quite deliberately:

contemporary non-nativism is not restricted to the vaguely delineated constellation of doctrines supposedly held by John Locke in the seventeenth century and B.F. Skinner in the twentieth. Non-nativists are not obliged to defend … Skinner as having proposed a productive research program on language acquisition … Skinnerian behaviorism is [not] entailed by the rejection of linguistic nativism. [p. 61]

So Raymondw seems to be alone in his suggestion that operant conditioning might be a basis for language learning. Or anyway, Pullum and Scholz are not going to back him up.

If they are not nativists and not Skinnerians, what do Pullum and Scholz think accounts for learning? Exactly what I gave in post 2 as the basis of cognitive psychology’s theory:

\[ \text{input} + \text{computation} + \text{output}. \]

The difference is they favor a special kind of computation.

Chomsky and school imagine a computer that is heavily pre-programmed (pretty much like the word processor I'm using right now), while Pullum envisions a computer that is wired to program itself on the basis of an internal response (I assume, strengthening and weakening associations within the computational system).

Neither one of them include sense data of the sort that Skinner assumed. Skinner took as his input something like, “Oh, a van Eyck,” while looking at a painting by the great artist. The stimulus was both the sentence AND the painting. I'm with Skinner on this point. But for Chomsky the input is only the sentence, while for Pullum the input is that sentence plus a lot of other sentences besides (what he calls a corpus) plus a statistical analysis of the corpus. Neither one of them includes the painting in the input. I'm amazed to see that I'm more of an empiricist than is the “non-nativist.”

The paper does include some results based on this kind of computation, and an analysis of an anecdotal case, showing a “non-nativist” interpretation. I consider neither one to be actual experimental evidence (the computation is just that, a calculation) but it is certainly more of a reply than Skinner was ever able to make.
So should I adopt this view? I balk for at least two reasons, both of which—oddly enough—have always kept me from embracing Chomsky too. First, there is no room in this approach for meaning and, second, it leaves the biology as mysterious as when we started.

Meaning is particularly challenging whenever investigators omit perception. Computational meaning requires definitions in databases, but humans usually prefer to resolve confusions and ambiguities by looking toward the larger world. Only metaphysics, mathematics, and bullshit can be discussed without looking at (or at least imagining) the outside world. Everything else requires at least the occasional environmental input if the listener is to understand what is said. For example:

- Jack and Paul are standing on the street and Jack says, “Hey, look at her.”
- Paul looks about and sees only one woman. He looks at her. Paul now understands what Jack said. An eavesdropping computer can also parse the sentence. Paul understands the sentence concretely, as referring to a woman in the here and now. The computer understands the sentence abstractly in a system of tautologies.
- Jack adds with a perfectly straight face, “She’s a real Angelina Jolie.” Paul bursts into laughter because the woman is unusually plain. He has understood the remark concretely, ironically, and cruelly. The computer, however, cannot even understand the remark abstractly. Its database may include the figurative definition of Angelina Jolie as a beautiful woman, and its parser may include the information that any sentence can be interpreted ironically, but the only way to understand this usage is to look at the woman and make a judgment.

These two men have shared a mean-spirited, misogynistic moment. It is not nice, but it is one of the things language can and frequently does do. It works by directing attention. This kind of speech, which constitutes a huge bulk of daily interactions, cannot be explained or understood by just looking at its structure. Pullum has been sucked into Chomsky’s trap. He is so busy looking for a way to address Chomsky’s structural issues that he has ignored all that Chomsky ignores. Sentences get their meanings—not just originally but with every usage—by pointing to things beyond themselves. And when a sentence is entirely self-referential—as in This sentence is false—it becomes simple gibberish.

Chomsky’s work has fallen into considerable disfavor on this blog because it cannot explain what the blog is about: the origin of speech. I see no clues in Pullum’s approach either. In particular, I’m not clear on what distinguishes human speakers from the mute chimpanzee. The nativists are very clear on that point: humans have many language-specific powers. What do “non-nativists” of the Pullum school say? I suppose they could toss in an ad hoc solution, citing say a linguistic or more generally communal motivation, as was discussed in the very post that kicked off this long series. But then, why not include all that communal input in the linguistic input? Why not include the gestures and facial expressions as part of the linguistic input? Frankly, I see no hope for any system that attempts to understand language without including a great deal of room for it’s subjective side.

While it was great to find a whole school of inquiry that I did not know about, and one has to admire Pullum, who seems to have spent his entire career in linguistics disputing a trend that should indeed be disputed, I’m not sold that this path has much to offer this blog.

Tomorrow the commenter will get his due and post his own thoughts on all this matter.

Links:
Barbara C. Scholz: [http://www.radcliffe.edu/fellowships/fellows_2006bscholz.aspx](http://www.radcliffe.edu/fellowships/fellows_2006bscholz.aspx)
*Contemporary Debates in Cognitive Science:*