

## Resolving Labov's Darwinian Paradox

It is amazing how quickly the significance of aspects of linguistic enquiry grows and diminishes. When Ruedi Keller, some 30 years ago now, asked me what I planned to do for my MA, I replied that I should like to investigate the principles of linguistic change. He was less than encouraging. Robert D. King's book on *Historical Linguistics and Generative Grammar* had recently been published (1969) and there seemed to be little point in pursuing a field which had been "sewn up" (in fact, King himself was to modify his position in 1975). I agreed to pursue other avenues, and went to Martin Durrell. But how wrong we were. The field has been revolutionized by advances both in sociolinguistics (see Trask 1996, McMahon 1994) and in evolutionary biology (e.g. Plotkin 1994).

Labov's *Principles of Linguistic Change* (1994, 2001, forthcoming) is one of the standard-bearers of this revolution, and a phenomenal work to boot, which I cannot hope to referee in depth in the time available to me here. However, some contextualization will be helpful, as this major three-volume work presents me with a problem. Broadly speaking, Labov investigates the principles of linguistic change from three perspectives: internal factors (1994), social factors (2001) and cognitive factors (forthcoming). In the first volume, Labov revisits old ground and presents, in his own words (2001:xiv) a "study of apparent-time and real-time principles governing chain-shifts; mergers, splits and near-mergers; the regularity of sound change; functional effects on linguistic change". His aim (and his achievement) was to "reduce a large number of phenomena to a small number of general statements" (2001:xiv), which is always the goal of real scientific enquiry. So he reduces the three / four principles of chain shifting of vowels (see 1994:116) to one (see handout) and proposes a resolution of the Neogrammarian Controversy regarding the regularity of sound change by maintaining that changes in phonetic realization of a category were regular, whereas changes in category membership showed lexical diffusion (see handout). His conclusions are not to be dismissed lightly, supported as they are by a wealth of empirical detail based on over thirty years of research, and I do not wish to do so; my interest is in the implications of his work as they come to light in the second volume (2001). Labov himself is cautious. "These generalizations and simplifications", he goes on "might well be called 'explanation' in the sense that is sometimes given to this term. But that is not the use that is natural to this work. *Explanation* (his italics) as used here is not a simplified description of events, but rather an account of antecedent causes. In the historical and *evolutionary* (my italics) approach followed here, explanations of linguistic change are not confined to internal linguistic principles, but relate linguistic behaviour to facts and principles from other domains." The approach of Volume 2 is therefore "to search for the material substratum of language change" (2001:xv). Labov follows "Meillet's position that the sporadic nature of language change can only be explained by correlations with the social structure of the speech community in which it takes place (1926:17)."

In his search for a genuine explanation, Labov begins by noting the parallel between biological and linguistic evolution using Darwin's *The Descent of Man* (1871), where he quotes "the formations of different languages and of distinct species, and the

proofs that both have been developed through a gradual process, are curiously parallel”. Not all of Darwin’s fifteen parallels seem to me to be of equal probative value. Parallels 1, 6, 7, 9, 10 seem to me to be particularly well founded, and also the two last, 14 and 15 which Darwin uses to argue that linguistic evolution shows the same kind of natural selection as biological evolution:

1. We find in distinct languages striking homologies due to community of descent ...
6. The frequent presence of rudiments, both in languages and in species, is still more remarkable
7. Languages, like organic beings, can be classified in groups under groups
9. Dominant languages and dialects spread widely
10. and lead to the gradual extinction of other tongues
14. We see variability in every tongue and new words are continually cropping up
15. Single words, like whole languages, gradually become extinct

Darwin’s conclusion is that “The survival or preservation of certain favoured words in the struggle for existence is natural selection.” but this Labov rejects, saying (2001:9) that “the general consensus of 20th-century linguists gives no support to this contention, and finds no evidence for natural selection or progress in linguistic evolution”. He cites Greenberg (1959:69), who says “Taking linguistic change as a whole, there seems to be no discernible movement towards greater efficiency such as might be expected if in fact there were a continuous struggle in which superior linguistic innovations won out as a general rule.” Labov continues by pointing out that it is (2001:10)

“not merely the absence of evidence for evolutionary adaptation that runs counter to Darwin’s argument for natural selection. The almost universal view of linguists is the reverse: that the major agent for change — sound change — is actually maladaptive, in that it leads to the loss of the information that the original forms were designed to carry.”

This second objection, that sound change is a disruptive rather than a constructive force, is exemplified by the fact that, “when tautosyllabic final /s/ disappeared in French, a number of compensating processes preserved the plural meaning [...] but there remain many cases where the plural meaning can no longer be signaled in standard French by grammatical means” (2001:12-13). Language change can complicate matters — Labov cites the case of northern Mandarin, where shortening of words resulted in an increase in the number of homonyms, which were disambiguated by further morphological material. “It would be difficult for Darwin,” quips Labov, “to argue that the shorter form had triumphed due to its own inherent virtue, when in compensation it developed a form that is roughly twice as long” (2001:13). His conclusion is that one can hardly argue with Darwin’s statement that

“The survival or preservation of certain favoured words in the struggle for existence is natural selection.”

as, in this form, it is nothing but a restatement of the fact that some words survive and others do not. Its significance, according to Labov, depends on the answers to two questions:

The first is: Are the factors that lead to the survival or preservation of individual words the same as those that operate to form the abstract sets of relations between sound and meaning? I take this to be asking whether the principles governing word survival are the same as those governing language structure and language change in general.

The second, more transparent question, is: Can the survival of particular forms or relations be shown to be the result of the adaptation of language to its environment?

The answer to both is for Labov “probably not”. The reasons for this are i) that the replacement of vocabulary seems to have many of the characteristics of random variability, as it is impossible to say which words will survive or not, whereas “the same principles do not appear for linguistic structure, where a number of directional principles have emerged” (2001:14); ii) “though analogy and dialect borrowing may compensate for the damage to linguistic structures caused by sound change, their operation is far too episodic and unpredictable to be compared to the systematic operation of natural selection”. So Labov find himself unable to accept the idea of a parallel between biological and linguistic evolution and arrives at what he calls Darwin’s Paradox, which he formulates in a strong form (2001:14)

**The evolution of species and the evolution of language are identical in form, although their fundamental causes are completely different.**

and a weak one (2001:15):

**The evolution of species and the evolution of language are identical in form, although the fundamental mechanism of the former is absent in the latter.**

The problem this presents me with is that Labov would probably not have spent so much time on this question unless he expected, or wished perhaps, that the answer to both questions referred to earlier would not be “probably not”, but “yes”. And he could have done, for I believe that his objection is based on fundamental misconceptions about evolution, and perhaps about language as well.

The clue to Labov’s misunderstanding of evolutionary processes lies first in his comment that he (2001:9) “finds no evidence for natural selection or *progress* in linguistic evolution”. Here the italics are mine. He also sees sound change as “disruptive” as noted above, but in fact he gives no examples where communication is irretrievably impaired. Indeed, seen in these terms, some evolutionary processes could be seen as disruptive — the fantastic tails of the birds of paradise for example, or the fact that our jaws have got smaller while the number of teeth they contain has not, creating dental problems for most of us. I am unsure of the probative value of his argument, unless it should be that sound changes impair communicative efficiency, which they clearly do not

otherwise half my listeners would be having difficulties of linguistic comprehension at this point, but, the whole idea is misplaced when applied to evolution, for evolutionary processes produce complexity out of simple systems. Thirdly, Labov seems to imply that random variability excludes the possibility of the directional principles he (I believe rightly) claims for linguistic systems. And yet evolutionary convergence is all around us. The Cambridge biologist Simon Conway Morris, for instance (2002:26) points out that “organisms faced with the same challenge repeatedly arrive at the same solution”.

Labov’s emphases on evolutionary progress, efficiency, and lack of direction seem strange to me, but they may be because he relies on Darwin’s own account of natural selection and ignores the work of the subsequent 150 years, especially that of relatively modern times (see Plotkin 1994:22-58 for a survey). It is not my purpose here to belittle Darwin’s big idea — this is one of the great ideas in science and the central theory of all biological sciences —, but Darwin himself had no clue of the source of the variation that the theory demands and he did not know how traits are passed on from parents to offspring. In animals, this had to wait until the “modern synthesis” after the discovery of DNA (see Edelman 1994:42-51). And others (e.g. Lewontin 1970) saw how Darwin’s big idea could be applied not only to animals and their genes (phenotypes and genotypes), but to biological systems in general. Nowadays, those who follow his ideas see the process as involving three components (source here is Sington et al. 1994:11), which, if present, will allow evolutionary processes to occur automatically.

1. Principle of Diversity: different individuals in a population have different characteristics of structure and function, shape and behaviour. This variation is spontaneous and inherent in the population and generated independently of the environment. What constitutes a population is not stated, except that it should have a biological component. It could be the individual animals in a group, each being different in many ways, or the sets of genes they carry, which is the conventional application to evolutionary biology. A population could be also be a set of behavioural patterns of individuals, which has led Wilson (1975) and others to propose a paradigm for the biological basis for all social behaviour called sociobiology. But it could also be the set of possible connections between brain cells, and looking at a population of this sort has allowed people like Edelman to propose a paradigm for brain function which he calls neural Darwinism (Edelman 1994:81-98). All I wish to suggest here is that a population may also be the set of lexical items or the set of sounds an individual uses, or indeed any set of linguistic items, however defined, which have a neural correlate.

2. Principle of Interaction. The variants must be given the opportunity to interact with their environment. In the case of animals, this involves interacting with the world outside, breeding and mixing genes and having the chance to create new individuals. Dawkins (1989) has even gone so far as to suggest that we are merely the throwaway packaging for our genes, which are the real units of selection. However, in an extended Darwinist view, the environment can be any one with which the population interacts. So, within a sociobiological framework, the environment could be the other individuals which influence the behaviour of the individuals who are the expression of the population in question, but other environmental factors could be social constraints or the thoughts or

feelings which accompany behaviours within individuals, in other words personal constraints and values. Within Edelman's brain model, the interaction with the environment consists of the auditory, visual and other sensory signals that reach our brain from eyes, ears and other sensory receptors; but it also consists of inputs from other areas of the brain, perhaps triggered by sensory inputs, but maybe also triggered by internal thought processes. What does the environment consist of in the case of language? Clearly, it is a combination of both the above, for linguistic behaviour is behaviour nonetheless and it therefore interacts with other speakers; it also has a mental correlate, so that the firing patterns associated with words, sounds, or any other linguistic entity, interact with the environment mediated by our senses the inner world of our own thoughts, expectations and prejudices.

3. Principle of differential amplification. This means that the variants which work in some way are advantaged and strengthened over those that don't. In biology, this means that variant individuals and their genetic baggage get to interact with other individuals and their genetic baggage and that, if offspring are produced, they stand a better chance of survival because of the way they have turned out. The consequence of this in a population which favours breeding by a given feature will be prevalence of that feature. So if women were solely turned on by men with black hair, we should soon (at least, soon within an evolutionary time-frame) have an entirely black-haired population. Fortunately for the rest of us, female choice appears to be based on more complex factors. In sociobiology, successful behavioural patterns are reinforced by feedback. In Edelman's brain model, amplification is achieved by strengthening those connections which work (actually, the very fact that the connection is used strengthens it, see Rose 1992). The patterns which are strengthened are more likely than others to fire again. In language we again have a combination of the two reinforcement processes: words (for example, but we could use any other linguistic entity as the unit of selection) which are appropriate to the context in which we use them work in the sense that they convey what we want to say. Our positive or non-negative experience allows us to presume that we can use them again. They therefore have offspring in the extended sense of the word within a neo-Darwinist model. We have not been asked to choose another word because our interlocutor has had difficulty understanding us, or because it has caused offence or produced a reaction which has made us feel uncomfortable; neither have we been forced to choose another word because it has not allowed us to impress the woman of the moment, convince the dim student of an idea we had taken as read, or for any other reason. In such circumstances, our subsequent use of the word, or any other linguistic entity, will probably be inhibited (given similar circumstances) by the negative experiences associated with it.

This picture replaces Darwin's (necessarily) crude idea of the survival of the fittest, or the struggle for existence. Richard Dawkins, probably one of the most eloquent and authoritative voices in the field of evolution, calls the process "the blind watchmaker, blind because it does not see ahead, does not plan consequences, has no purpose in view" (1991:21). So there is no "progress" in the generally accepted sense of the term. The principle of least effort is an ineffective principle of selection if it does not allow us to accomplish our goals as language users. We cannot say in advance what those goals

might be. To call a process such as sound change maladaptive is simply a value judgment and therefore unscientific. It may be that the adaptive value of the change is not immediately apparent, but that of itself is not an argument against viewing a change as adaptive. Labov reviews a number of previous proposals for causes of sound change, and notes that few of these discussions discriminate between different types of sound change, subsequently reviewing sound-shifts, lenition, mergers and splits, as well as deletions in this light and in respect of the extent to which these are available for social evaluation. Here, I must confess, I lose the thread of the Darwinian argument. Labov moves on to describe his task of locating the leaders of linguistic change, outlining the curvilinear hypothesis, which he seeks to “confirm or disconfirm” (2001:33) and the results “applied to illuminate or perhaps reduce the Darwinian paradox” (2001:33). He mentions the matter of his initial chapter but once more on page 191 of xxx pages in a subsection entitled “Are sound changes part of an adaptive process?”, and my impression is that he remains unconvinced. Studies which purport to show environmental adaptation assume a solution to the Darwinian paradox in advance “and the problem is not to find out if there is an adaptive value to linguistic evolution, but rather to find out which form of adaptation is operating” (2001:191). Now it should be pointed out that if biologists had to prove their operating theory every time they looked at a a problem, they would probably not discover a great deal. For good or ill, they take the principles of evolution as read. As Theodosius Dobzhansky, one of the architects of the modern synthesis wrote: “Nothing in biology makes sense except in the light of evolution” (cited in Plotkin 1994:37).

So we can solve Labov’s Darwinian paradox by assuming the current model of evolutionary systems and seeing if they apply to linguistic activity. The question it seems to me is a simple one: in any given situation, do the three principles of evolution apply — it seems to me blindingly obvious that they do.

Variation is apparent in Labov’s own data, which he can only make sense of by means of statistics. Almost any of his tables and figures will bear this out. And variation is present in every facet of language. One could go on for ever citing examples of the slightly differing formant frequencies used in different vowels in different contexts, different voice onset times, manifestations of the maxim I learned in my first linguistics lecture in Manchester: Speech is infinitely varying. We seem to have forgotten this over the years. In fact, to borrow a phrase from Hockett, it seems to be one of the design features of language and should therefore be one of the starting points for linguistic theory.

Another design feature is interaction, which is also built into Labov’s model, otherwise how could the “leaders of linguistic change” influence other speakers? The insight that all linguistic activity is embedded in joint projects was mediated to me by Clark (1966), whose basic idea is that “People use language for doing things with each other, and their use of language is itself a joint action” (1996:387). Essentially, this is derived from Austin’s How to do things with words (1962) approach, but the idea of joint actions rather than autonomous or unconnected activity is more sharply focused in Clark’s writing. He goes further (1996:387):

“Language is rarely an end in itself. It is primarily an instrument for carrying out broader activities [...] in which two or more people, in socially defined roles, carry out individual actions as parts of larger enterprises. Language is simply a device by which they coordinate those individual actions.”

In other words, language is not autonomous and cannot be studied “without studying joint activities and vice-versa” (1996:387). This is surely important for Labov’s data. The social networks are described to us and the leaders of change portrayed, but we do not gain much insight into concrete interactions. I certainly feel that this level of microanalysis of Labov’s subjects is a bit much to ask within the compass of his book, but before he rejects an evolutionary framework for his work, he should give it a fair chance.

There must also be differential amplification Labov’s model, as one thing we do see is how the changes initiated by the leaders spread through the population. It’s probably nothing to be too surprised about: language is not static in any of us.

Given these circumstances, at least in the current state of knowledge about evolutionary theory, there is no doubt in my mind that Labov is describing evolutionary changes and that the Darwinian paradox is more apparent than real. Labov’s Darwinian Paradox must therefore be replaced by a new law: The mechanisms underlying biological and linguistic evolution are identical. Far from being surprising, this is just what we would expect, as language is expressed in the joint activities of human beings and is therefore a biological system.

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