

# BIO-LINGUISTICS

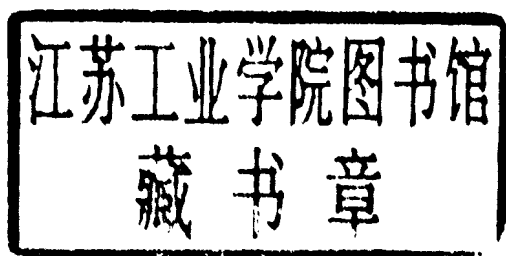
The Santa Barbara  
Lectures

T. Givón

# Bio-Linguistics

The Santa Barbara Lectures

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## Preface

Is mind a biological phenomenon? Has mind — spirit, soul — evolved, or is it but a mysterious projection of the biological brain, a soft behavioral program launched off the hardened genetic platform? And where exactly do language and culture fit in the firmament of human existence? These questions may be tackled from a variety of perspectives, each rooted in its own ancient philosophical predilections. One may choose, treading in the well-worn footsteps of Plato and Aristotle, to view mind, language and culture as our species' most conspicuous claim to uniqueness, an audacious saltation from our crude *merely*-biological antecedence. From such a perspective, language, mind and culture, transcendent extravagant flowers of the human soul, are neither constrained by mundane adaptive (Darwinian) pressures nor explained by plodding adaptively-guided (Darwinian) evolution. Whether the cause of this radical departure in the primate line be attributed to a spark of the Divine, or to a serendipitous mega-mutation, the humble explanatory parameters of evolutionary biology do not apply. Between the biological and the cultural, between the brain and the mind, the adaptive and the arbitrary, the constrained and fancy-free, lies an unbridgeable chasm. And while some proponents of this radical uniqueness of *homo sapiens* may concede a genetic basis to the extraordinary — and thus presumably innate — linguistic capacities of our species, they continue to view its unprecedented emergence as governed by unique principles that transcend the mundane mechanics of evolutionary biology.

A somewhat different perspective concedes that the human mind may be the product of adaptive evolution, culminating in a genetically-configured real organ, the brain. But language and culture merely *fall out of*, or *emerge* from, the biologically-evolved mind-brain, requiring no further specific adaptations. From such a perspective, the emergence of language in either ontogeny or diachrony is fully predicted from the interaction between the adaptively-constrained mind, on the one hand, and the free-ranging socio-cultural context, on the other. Whatever universal features that may be observed in human language(s) are but universals of mind-brain. Though such universals are surely

mitigated by the freely-construed socio-cultural environment. In other words, the mind-brain may have evolved, but language and culture did not, or not yet. They are, as of now, but 'soft' behavioral responses to serendipitous environmental contingencies.

The perspective adopted in this book takes it for granted that a rigid separation between biology and culture is compatible neither with the observed facts nor with a mature theory of evolution. Human culture, however complex and abstract it may be, is not diminished by conceding its ancient biological roots. Nor is biology over-interpreted or softened by noting the old pre-human lineage of sociality, culture and communication. Culture is, indeed, an unimpeachably biological adaptation, a mechanism through which 'soft-wired' lifetime behavioral experimentation serve as the pace-maker of 'hard-wired' generic evolution. Culture — the sharing of perspective among conspecifics — is the adaptive foundation of social cooperation among members of the same community of interest, be it in matters of reproduction, foraging, hunting, defense or comfort. Adaptive pressures, the hallmark of biological evolution, persist far beyond human culture's hallowed gates, albeit much transformed by the added complexity and its attendant explosion of diversity.

The rise of socially-shared cognition and communication makes the life of bio-organisms — and of the scientist who studies them — more complex, less predictable, more replete with a diversity of behavioral choices and adaptations. The advent of self-consciousness, multiple perspectives and perspectives-upon-perspectives renders such complexity and diversity that much more explosive. But it still does not alter the essentially-adaptive nature of the overall enterprise. Cultural, linguistic and cognitive complexity, with their attendant intra-communal and cross-communal diversity, do not in any way obviate the adaptive nature of anything human. They only re-position the notion 'adaptive' in a more complex, multi-variant context. While doing science in such a context is much harder, giving up because of complexity and variability is not a rational option.

When language is viewed as a biological phenomenon, then the study of diversity — both within the individual speaker or speech community and across languages — becomes enormously relevant. Variation is aptly treated by empirically-inclined linguists as a vital methodological issue. In such a context one may point out, following W. Labov, to the utter empirical untenability of Chomsky's idealized *competence* and its Siamese twin, *generativity*. But variation is also an indispensable theoretical construct in any biologically-rooted domain. It is both the end-product of emergence and the very mechanism via which

extant — *synchronic* — structures come into being diachronically. As in biology, one may observe that today's cross-speaker, cross-dialect or cross-language variants are but the manifest end-points of the diachronic pathways that gave them rise. As in biology, today's pool of intra-speaker or cross-speaker variants within the speech community are but the inventory of potential diachronic changes, i.e. of tomorrow's emergent types.

If the diachronic emergence of language is at the core of our theoretical explanation of synchronic typological diversity, as Joseph Greenberg noted, then the site of explanatory universals of language must be re-positioned. Rather than being an inductive summary of the extant synchronic variants, universals of language, much like those of biology, are the set of (presumably adaptive) principles that constrain and explain the emergence of extant diversity. Ultimately therefore, the real locus where language universals exert their adaptive pressure is the developmental mechanism itself. But since development is nothing but the protracted accretion of on-line behaviors of the communicating individual, language universals exert their formative pressure during on-line linguistic *performance*. Much like biological universals, which exert their adaptive pressure on the ongoing processes of ontogenesis and phylogenesis.

Many of those who follow Joseph Greenberg's work and count him as their inspiration have taken it for granted that his notion of universals was strictly inductive, statistical, implicational. I think this reading is perhaps less than fully insightful, given Greenberg's adaptively-oriented work on markedness, and given his profoundly diachronic view of extant synchronic types. In choosing to dedicate this book to Joe, I have elected to interpret his approach to the balance between universality and diversity more comprehensively.

At the methodological level first, Joseph Greenberg's pairing of typology-*cum*-universals was guided by a mundane Aristotelian insistence that if one were to propound a theory of language universals, it would be somewhat irresponsible to do so without first consulting a representative sample of cross-language diversity. The fact that Aristotle practiced this empirical caution in his work on Biology and Politics but not on language is of course curious, but a *non sequitur*.

At the theoretical level, Greenberg was a hardy survivor of two successive waves of American structuralism, one strictly empiricist and unabashedly atheoretical, the other emphatically rationalist, theoretical with a vengeance, but disdainful of the burdens of empirical science. A man of abiding curiosity and driven by the need to explain, Greenberg was inclined to insist on *both* an explanatory theory and an empirical methodology.

To many of us who never took a single class from Joseph Greenberg, he was a generous mentor who nevertheless cast his young associates adrift to do their own thing; who taught by example and corrected with a gentle smile and a tentative suggestion; who never tired of reaching for the elusive balance between the diversity of human languages and the universality of human language. *Requiescat in pace.*

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## CHAPTER 1

# Language as a biological adaptation

### 1.1 Historical notes

#### 1.1.1 Functionalism in biology

The most amenable point of departure for a functional-adaptive approach to language is to be found in Biology, the mother-discipline of all the human sciences and a profoundly functionalist enterprise for over two thousand years. Functionalism in Biology harkens back to Aristotle, who more or less single-handedly dislodged the two structuralist schools that had dominated Greek biological thought until his time. Both schools sought to understand live organisms componentially, just like inorganic matter. Empedocles proposed to explain organisms by their component elements, while Democritus opted for understanding organisms through their component parts, i.e. structure.

In his *De Partibus Animalium*, Aristotle first argues against Empedocles' elemental approach, pointing out the relevance of histological and anatomical structure:

“...But if men and animals are natural phenomena, then natural philosophers must take into consideration not merely the ultimate substances of which they are made, but also flesh, bone, blood and all the other homogeneous parts; not only these but also the heterogenous parts, such as face, hand, foot...” (*De Partibus Animalium*, McKeon ed. 1941, p. 647)

Aristotle next notes the inadequacy of Democritan structuralism:

“...Does, then, configuration and color constitute the essence of the various animals and their several parts?... No hand of bronze or wood or constituted in any but the appropriate way can possibly be a hand in more than a name. For like a physician in a painting, or like a flute in a sculpture, it will be unable to do the *office* [= function] which that name implies...” (*ibid.*, p. 647; italics & bracketed translations added)

Next, Aristotle offers his functionalist touchstone — the teleological interpretation of living things, using the analogy of usable artifacts:

“...What, however, I would ask, are the forces by which the hand or the body was fashioned into its shape? The woodcarver will perhaps say, by the axe and

auger; the physiologist, by air and earth. Of these two answers, the artificer's is the better, but it is nevertheless insufficient. For it is not enough for him to say that by the stroke of his tool this part was formed into a concavity, that into a flat surface; but he must state the *reasons* why he struck his blow in such a way as to affect this, and what his final *object* was..." (*ibid.*, pp. 647–648; italics added)

Finally, Aristotle outlines the governing principle of functionalism — the mapping or isomorphism between form and function:

"...if a piece of wood is to be split with an axe, the axe must of necessity be hard; and, if hard, it must of necessity be made of bronze or iron. Now exactly in the same way the body, which like the axe is an *instrument* — for both the body as a whole and its several parts individually have definite operations for which they are made; just in the same way, I say, the body if it is to do its *work* [= function], must of necessity be of such and such character..." (*ibid.*, p. 650; italics and brackets added)

Ever since Aristotle, structuralism — the idea that structure is autonomous, arbitrary and requires no 'external' explanation; or worse, that structure somehow explains itself — has been a dead issue in biology, a discipline where common-sense functionalism is taken for granted like mother's milk. Thus, from a contemporary introductory anatomy text:

"...anatomy is the science that deals with the structure of the body... physiology is defined as the science of function. Anatomy and physiology have more meaning when studied together..." (Crouch 1978, pp. 9–10)

Or from an introduction to animal physiology:

"...The movement of an animal during locomotion depends on the structure of muscles and skeletal elements (e.g. bones). The movement produced by a contracting muscle depends on how it is attached to these elements and how they articulate with each other. In such a relatively familiar example, the relation between structure and function is obvious. The dependence of function on structure becomes more subtle, but no less real, as we direct our attention to the lower levels of organization — tissue, cell, organelle, and so on... The principle that structure is the basis of function applies to biochemical events as well. The interaction of an enzyme with its substrates, for example, depends on the configuration and electron distributions of the interacting molecules. Changing the shape of an enzyme molecule (i.e. denaturing it) by heating it above 40° C is generally sufficient to render it biologically nonfunctional..." (Eckert and Randall 1978, pp. 2–3)

### 1.1.2 Structuralism

Paradoxically, it was Aristotle, in his semiotics — theory of signs — who also launched the structuralist approach to language. In his *De Interpretatione*, Aristotle presents one of the earliest systematic discussions of the relation between world, mind and language:

“...Now spoken sounds [‘words’] are symbols of affections of the soul [‘thoughts’], and written marks are symbols of spoken sounds. And just as written marks are not the same for all men [‘are language specific’], neither are spoken sounds. But what these are in the first place signs of — affections of the soul — are the same for all [‘are universal’]; and what these affections are likenesses of — actual things — are also the same for all men...” (*De Interpretatione*, tr. & ed. by J. L. Ackrill, 1963; bracketed translation added)

From Aristotle’s empiricist perspective, thoughts (‘affections of the soul’) reflect external reality (‘actual things’) faithfully, iconically (‘are likenesses of’). What is more, this reflective relation is universal (‘the same for all men’). In contrast, linguistic expressions (‘words’) bear an arbitrary relation to (‘are symbols of’) thoughts. And this relation is not universal (‘not the same for all men’).

It is of course true that Aristotle’s doctrine of the arbitrariness of the linguistic sign — thus the arbitrariness of cross-language diversity — referred only to the coding of concepts (words) by sounds or letters. But latter-day structuralists unreflectively extended the arbitrariness doctrine across the board to grammar.

In the early 20th Century, structuralism reasserted itself in the nascent social sciences, often as a reaction to the ardent if sometime naive functionalism of the 19th Century’s Romantics. To the infant disciplines of psychology, anthropology and linguistics, two towering exponents of Logical Positivist philosophy of science, Bertrand Russell and Rudolph Carnap (see Russell 1956; Carnap 1963) sold the deceptive analogy of physics.

In tracing back the roots of 20th Century structuralism to Positivist philosophy, one must recognize that its ultimate descent goes all the way back to Aristotle’s objectivist epistemology. This is fairly transparent in, for example, Carnap’s later reflection upon the physicalism of the Vienna Circle:

“...The thesis of physicalism, as originally accepted in the Vienna Circle, says roughly: Every concept of the language of science can be explicitly defined in terms of observables; therefore every sentence of the language of science is translatable into a sentence concerning observable properties...”  
(Carnap 1963, p. 59)