RIVISTA INTERNAZIONALE DI FILOSOFIA E PSICOLOGIA
DOI: 10.4453/rifp.2013.0017
ISSN 2039-4667; E-ISSN 2239-2629
Vol. 4 (2013), n. 2, pp. 192-197

Studi

From "Superorganic" to "Superorganismic". A Possible Dialogue Between the Humanities and the Neurosciences on the (Model of) Language

Antonio Perri

Ricevuto il 20 ottobre 2012, accettato l'8 marzo 2013

Abstract The aim of this paper is to briefly assess, from the point of view of a linguist, the main contributions that experimental results and theoretical assumptions in neuropsychology have made to linguistics. The "neuromaniacal" fascination witnessed over the last three decades in linguistics is often bitterly criticized, suggesting a different approach to building a promising dialogue between the humanities and neurosciences – one sheltered from reductionism, which has proved so detrimental to many of the approaches developed so far.
KEYWORDS: Models of Language; Biological Foundations of Language; Localizationism; Anthropological Linguistics; Superorganic vs Superorganismic Approaches to Language.

Riassunto *Da superorganico a superorganismico. Un possibile dialogo fra scienze umane e neuroscienze sul (modello di) linguaggio* – L'articolo presenta un sintetico giudizio, formulato dal punto di vista di un linguista, circa gli apporti che le acquisizioni sperimentali e gli assunti teorici della neuropsicologia hanno offerto alla linguistica. Dopo aver aspramente criticato l'atteggiamento "neuromaniaco" prevalso nella linguistica dell'ultimo trentennio, si ipotizza l'avvento di un promettente dialogo fra scienze umane e neuroscienze fondato su presupposti diversi, e soprattutto in grado di sottrarsi al riduzionismo che ha recato danni notevoli a molti approcci proposti sinora.
PAROLE CHIAVE: Fondamenti biologici del linguaggio; Localizzazionismo; Antropologia del linguaggio; Approcci "superorganici" vs "superorganismici" allo studio del linguaggio.

Introduction

THE ASPECT OF BROCA'S CONTRIBUTION I'd like to address in this paper as a linguist – coming, moreover, from the socio-anthropological approach to language which is basic to my philosophy – may be considered "narrow".

There, the question we started from was «what is left over of Broca's ideas in contemporary neurological theory, and in actual models of language and mind?» – an immense domain, the core of which lies at the intersection of neuropsychology, with its theoretical and empirical insights, and the general findings of two intrinsically interwoven philosophies (i.e. of language, and of the mind). Nothing needs to be said, from this broad point of view, about the social dimension of the faculty of language;

A. Perri - Suor Orsola Benincasa, Napoli (✉)
E-mail: perrimessico@libero.it

it seems that what characterizes my approach is exactly what is left out.

Nevertheless, I decided to rephrase the question in a more specific way: if linguistics, together with other human sciences, acknowledges (at least some of) the new perspectives emerging from Broca's ideas (as in fact has), will it really find new horizons in the study of languages and speech – in the Saussurean sense of empirical and cultural *langues* and *paroles*, aside from the *langage* as a human-specific universal category?

Ironically, this new rephrasing gives way to a corollary question, which turns out to be of a general and epistemological import – ultimately "re-broadening" the issue addressed at the end of my paper, at least in a tentative mode: is it possible, for the humanities, to build up a dialogue with neurosciences without falling into any reductionist pitfalls or hazardous oversimplifications in the analysis of such complex cognitive activities as those performed by man-in-society?

A negative attitude towards (neuro)biological foundations

The first point to be stressed is that, during the last century and up until the Sixties, linguists were particularly reluctant to accept the biological foundations of language as a possible starting point for any scientific analysis of historical idioms.

To justify this attitude, two main reasons were invoked: first, the risks of racism; second, the alleged loss in autonomy of the discipline. However, linguistics seemed to offer a quite sterile counterproposal: an historicist, optimistic view of the cultural evolution of man (today almost dismissed) but also an aprioristic, ideological defence of the death of relativistic arguments – whose positive value was to be widely debated in the subsequent years. "Neurological" theses, when accepted, were in general re-articulated in a structural framework (e.g. think of Roman Jakobson's *Two Aspects of Language and Two Types of Aphasic Disturbances*[1]): Jakobson offered a fascinating perspective, despite oversimplifying aphasic phenomena in order to fit them into schemes fulfilling a pure *ésprit de geométrie* (such as the combination *vs.* selection axis, thus ranging the varieties of aphasia on a continuum between two polar types: contiguity disorder *vs.* similarity disorder).

The rise of neuroimaging, and the "biological turn"

Since the beginning of the Eighties, progress in the neurosciences and in neuroimaging has had major consequences for linguistic thinking – albeit not always as good as one had expected. More specifically, we witnessed an increasing "biologization" of Chomskyism, together with a trivialization of such biological approaches to language such as that found in a work considered to have made, in many respects, a seminal contribution to "popular" linguistics – namely *The Language Instinct* by Steven Pinker.[2]

I will quote a pertinent passage from this book where the author imagines «a dramatization of what grammatical information processing might be from a neuron's-eye view».[3] Indeed, Pinker's arguments are grounded on an "anglocentric chauvinism" which, in my opinion, would be regarded as intolerable by any mainstream linguist: «try to imagine what this network might look like in a baby.

Pretend that each of the pools is innately there. But wherever I have drawn an arrow from a single neuron in one pool to a single neuron in another, imagine a suite of arrows, from every neuron in one pool to every neuron in another. This corresponds to the child innately "expecting" there to be, say, suffixes for persons, numbers, tenses, and aspects, as well as possible irregular words for those combinations, but not knowing exactly which combination, suffixes or irregularities may be found in his particular language».[4]

What about the feeling of a Chinese-speaker when hearing such a characterization, since her/his language simply doesn't have any suffixes or prefixes?

From the "localization trend" to "neuromania"

Biological trivialization reached its peak when the much-debated thesis supporting a too rigid "localizationism" of faculties in the human brain was uncritically espoused by neurobiologists – of course this is not the case for cautious neuroscientists who, like Alberto Oliverio in his speech today, emphasized that the neurosciences are *not* a new phrenology, thereby denouncing any reductionist bias.

That this widespread view was highly unconvincing had already been clearly stated in a "classical" textbook of the pre-neuroimaging era, considered for almost thirty years to be the basic reference in this field:

> The surgical destruction of those punctuate loci from which some specific behavior patterns may be elicited through electrical stimulation does not always abolish that behavior [...] It is hard to escape the conclusion that the nervous activity that mediates specific behavior patterns and experiences is never confined to any cerebral locus. Behavior must be the product of intersection and integration of functions of many components of the brain.[5]

Perhaps we are sensitive to the rough nature of Lenneberg's statement, since it seems to allude to experimental practices which are considered to be particularly unethical in our times; however, it is clear that his idea that integration (either holistic or not) between components is necessary in order to perform complex activities contradicts any strong claim to localization; the same, moreover, can be said of the recent hypothesis put forward by a leading French neuroscientist, Stanislas Dehaene – of so-called "neuronal recycling".[6]

Even the Great Simplifier Pinker, on this subject, is forced to give up: after discussing the roles of Broca's and Wernicke's areas in the brain, he admits both that «the role of Broca's area in language is maddeningly unclear»,[7] and that «to be honest, no one really knows what either Broca's area or Wernicke's area is for».[8]

A double paradox: "neurologized" linguistics and "metaphysical" neurosciences

The unexpected outcome of this "neuromaniacal" trend is in fact a double paradox. On the one hand, linguistics (and the other human sciences) are more and more often subjected to the fetish of neurobiological data (suffice here to think of such "trendy" theories such as Semir Zeki's *neuroesthetics*)[9]; while on the other hand, the neuroscientific field, when addressing the experimental task of locating the cortical and neurological substrates for complex activities, often refuses to debate some received ideas from the humanities – as scientific paradigms institutionalized in academic thinking, thus assumed to be "normal" (still in the Kuhnian sense) and undisputable.

Since I'm mostly dealing with the practices of writing and reading, suffice here to just mention an eloquent example from Dehaene's *Les neurones de la lecture*. Indeed, when discussing Chinese writing at the beginning of his work, the author simply restates a common typological (totally Eurocentric) chauvinism, which is – what is more – unjustified on neurological grounds.

While emphasizing, with a biased but all too widespread argument, the "perfection" of the alphabet used to transcribe Italian («la langue italienne est parfaitement adaptée au choix d'une orthographe transparente: à chaque lettre correspond un son unique et indépendant du contexte, et à chaque chaîne de sons correspond un mot précis, dont le sens et l'inflexion grammaticale sont dépourvues d'ambiguïté»[10]), Dehaene reassesses as follows the "myth" of the Chinese writing system being "poorly functional":[11] «en chinois mandarin, on assiste à un phénomène inverse de celui de l'italien. La plupart des mots chinois ne comportent q'une ou deux syllabes, et comme il n'ya qu'environ 1300 syllabes, chacune d'elles peut renvoyer à des dizaines de concepts très différents. [...] C'est pourquoi

une écriture purement phonétique du chinois serait parfaitement inutilisable :[12] chacun de ces rébus pourrait être compris de dizaines de manières différentes! [*sic*]. C'est pourquoi les milliers de caractères du mandarin transcrivent principalement les mots, ou plus exactement les morphèmes».

However, since Chinese also makes use of "phonetic indexes" as specific components of single characters, in order to mark the pronunciation of a given root (albeit approximately),

> contrairement aux idées reçues, même le chinois n'est pas une écriture purement idéographique – dont les éléments dénotent les concepts –, ni logographique – dont les signes réfèrent à des mots[13] –, mais bien un système mixte "morpho-syllabique" où certaines signes renvoient au sens des mots et d'autres à leur prononciation [even if each 'sign' is always part or a component of a single character as a unit!].[14]

Here comes Dehaene's tricky play: in fact, from a neurological point of view,

> non seulement c'est la même région du cerveau qui est sollicitée pour la lecture du chinois et de l'alphabet, mais de plus elle montre les mêmes propriétés fonctionnelles chez les locuteurs du chinois [why not "readers"?] que chez les lecteurs d'écritures alphabétiques .[15]

Therefore we must speculate as follows: «il est probable qu'elle [the left occipital-temporal region] comprenne aussi une hiérarchie de détecteurs capables de répondre aux marqueurs sémantiques et phonétiques qui composent les caractères»,[16] where such sensors are not arranged in any "holistic" way.

Such a hierarchy is to be compared – in the case of a subliminal presentation of coherently selected fragments of a Chinese character – to the effect we would obtain using the alphabet «lorsque l'on précède un mot par l'un de ses morphemes ("chasse" suivi de "chasseur")», thus working at the level of first articulation (i.e. meaningful) units.[17] Despite all this, Dehaene asserts that

> Bien entendu, il est plus difficile d'apprendre à lire le chinois que de déchiffrer l'italien. Il faut apprendre des milliers de signes dans le premier cas, alors qu'il suffit d'acquérir quelque dizaines de correspondances lettre-son dans le second.[18]

We are immediately aware here that "reading" (*lire*) is not the same as "deciphering" (*déchiffrer*): thus, readers of Italian are in any case obliged to learn thousands of morphemes in order to "understand" a text – exactly as their Chinese colleagues must do.

Linguistics, anthropology and (universal?) linguistic rules

To be sure, neither the anthropologist nor the anthropologically oriented linguist seem to pave the way for "new horizons" if they admit into their research programmes the widely accepted idea of a "strong" relationship between a (possible) cerebral localization of the language faculty and the formal universals of Chomskian UG (e.g. X-bar theory).

Conversely, an interest in social variability in language use has led them to wonder if it would be useful to look for other kinds of universal "rules", at a more "surface" level from a generative point of view. Moreover, these rules should be regarded as fundamental for discourse and communicative processes, because they are grounded on conversational and textual constraints – such as those William Labov referred to more than forty years ago:

> a very great number of linguistic rules are not variable in the least: they are categorical rules which, given the proper input, always apply [... They are] invariant rules of grammar derived from studies of language quite apart from any social context. There are [however] some areas of linguistic analysis in which even the first step towards the basic, invariant rules cannot be

> taken unless the social context of the speech event is considered. The most striking examples are in the analysis of discourse.[19]

I wonder whether a detailed and serious study of localization processes could explain in future some of those constraints, apparently so far from a "modular" view of language (of the kind developed by Fodor three decades ago[20]): indeed it is now quite well established that different aspects are involved – ranging from perception to categorization and intentional agentive planning (also communicational).

A possible dialogue?

I think that the neurosciences – provided we don't reduce them to mere experimental devices in the search for evidence for reductionist postulates, as happened in biology and socio-biology during the Seventies – can support linguists, and social scientists in general, to achieve a decisive goal: understanding the emergence of the mind from the brain, *but* in a cultural environment which basically constitutes the distinctive nature of man.

This, at least, is the argument recently made by the eminent anthropologist Marshall Sahlins[21]: indeed, for Sahlins, culture has been an essential condition for the biological development of the human species. If so, maybe we will finally be able to change the time-worn, idealistic metaphor of the *superorganic* forged by Kroeber in his seminal *Anthropology* into a different perspective, more consistent with a cognitive analysis of social behaviour and resorting to the metaphor of "contagion".[22]

> "superorganic" means simply that when we consider culture we are dealing with something that is organic but which must also be viewed as something more than organic if it is to be fully intelligible to us [...]. In short, culture is superorganic and superindividual in that, although carried, participated in, and produced by organic individuals, once it is acquired [...] the institutions and practices and ideas constituting it, have a persistence and can be conceived as going on slowly changing way "above" or outside the societies that support them.[23]

Think for example of the long path followed by Dan Sperber from a critical analysis of *Le savoir des anthropologues*[24] to a cognitive view of culture and linguistic behaviour[25] – through an *epidemiology of beliefs*[26] (or of "representations") which is still too materialistic, since it reduces the necessary explanations of cultural phenomena to causal ones.

Furthermore, Sperber's approach is to be reproached for its strong mentalist individualism: according to the anthropologist, indeed, public representations only have a meaning if we can match them to mental (i.e. individual) representations – an argument which in my view is far from convincing.

I'd like to close by reassessing the non-reductionist dialogue I alluded to at the beginning: is the search for biological constraints in linguistic behaviour resulting from the implementation of an approach grounded in the *interaction* between human subjects a valid strategy?

In such an approach, the individual mind integrates with other minds not in an ideal *superorganic*, but in a "molecular" *superorganismic* way – i.e. like the eusocial ants described in an astonishing and recent book by Hölldobler and Wilson.[27] Thus, e.g., Sperber provides a list of factors which contribute to the explanation of a set of cultural representations, finding factors of psychological and environmental (or ecological) import; but in doing so, he seems to subscribe precisely to a "superoganismic" and not an individualistic view – more specifically since he takes «the environment to begin at the individual organism's nerve endings and to include, for each organism, all the organisms it interacts with».[28]

I hope that such a research will finally lead neuroscientists, psychologists and linguists altogether – along a line that anthropology has irreversibly espoused – beyond the too-

narrow framework (solipsist, Cartesian), which in linguistics is still the paradigm of the Chomskyian formal approach but is now sharply countered by all contemporary approaches to evolution.

Notes

[1] R. JAKOBSON, *Two Aspects of Language and Two Types of Aphasic Disturbances*, in: R. JAKOBSON, M. HALLE, *Fundamentals of Language* (1956), Mouton, The Hague-Paris 1971, pp. 67-96.
[2] S. PINKER, *The Language Instinct*, William Morrow, New York 1994. Quotations are from the first UK edition, Penguin, Harmondsworth 1995.
[3] *Ivi*, p. 317. While the author feels bound to add that «it is not something you should take particularly seriously», he nevertheless considers this to be a «demonstration that the language instinct is compatible in principle with the billiard-ball causality of the physical universe, not just mysticism dressed up in a biological metaphor». In my view, this kind of «dramatization» is exactly what is needed to dismiss the language instinct as «just mysticism dressed up in a biological metaphor».
[4] *Ivi*, p. 320.
[5] E.H. LENNEBERG, *Biological Foundations of Language*, John Wiley and Sons, New York 1967, pp. 214.
[6] See S. DEHAENE, *Les neurones de la lecture*, Odile Jacob, Paris 2007.
[7] S. PINKER, *The Language Instinct*, cit., p. 310.
[8] *Ivi*, p. 311.
[9] See S. ZEKI, *Inner Vision: An Exploration of Art and the Brain*, Oxford University Press, Oxford 1999; S. ZEKI, *Splendors and Miseries of the Brain: Love, Creativity and the Quest for Human Happiness*, Wiley-Blackwell, Chichester 2009.
[10] S. DEHAENE, *Les neurones de la lecture*, cit., p. 64. Not merely as a linguist, but as a native Italian speaker I would like to cast some doubts on this all-too-easy statement made by Dehaene.
[11] This prejudice has been recently discussed, refused and correctly reframed within Western linguistic thought by another leading scholar of French studies in Chinese linguistics, Viviane Alleton: see V. ALLETON, *L'écriture chinoise. Le défi de la modernité*, Albin Michel, Paris 2008.
[12] Notice that in this context Dehaene completely forgets about *pinyin*, i.e. the use of the Latin alphabet to transcribe Chinese words, which has been used alongside the traditional system of characters for more than half a century.
[13] I wonder why the author rejects the term "logographic" to define the nature of a Chinese character. The only reason I can find is that it doesn't fit his (alphabetically biased) idea of a "strong" correspondence one-to-one with a single word, provided this never happens in isolant languages like Chinese.
[14] S. DEHAENE, *Les neurones de la lecture*, cit., pp. 64-65.
[15] *Ivi*, p. 140.
[16] *Ibidem*.
[17] *Ivi*, p. 113.
[18] *Ivi*, p. 65.
[19] W. LABOV, *The Study of Language in its Social Context* (1970), in: W. LABOV, *Sociolinguistic Patterns*, University of Philadelphia Press, Philadelphia 1972, pp. 183-259, here p. 252.
[20] See J.A. FODOR, *The Modularity of Mind. An Essay of Faculty Psychology*, MIT Press, Cambridge (MA) 1983.
[21] See M. SAHLINS, *The Western Illusion of Human Nature*, University of Chicago Press, Chicago 2008.
[22] D. SPERBER, *The Epidemiology of Beliefs*, in: C. FRASER, G. GASKELL (eds.), *The Social Psychology of Widespread Beliefs*, Oxford University Press, New York 1990, pp. 25-44
[23] A.L. KROEBER, *Anthropology. Race, Language, Culture, Psychology, Prehistory*, Harcourt Brace Jovanovich, New York, 1948 (second revised edition). Quotation are taken from the volume *Anthropology: Cultural Patterns and Processes*, Harbinger Books-Harcourt, Brace and World, New York-Burlingame 1963 (consisting of Chapters 1, 6, 7, 8, 9 and 10 of the 1948 revised edition), pp. 61-62.
[24] D. SPERBER, *Le savoir des anthropologues*, Hermann, Paris 1982.
[25] D. SPERBER, D. WILSON, *Relevance: Communication and Cognition* (1986), Blackwell Publishing, Oxford-Cambridge 1995 (second edition).
[26] D. SPERBER, *The Epidemiology of Beliefs*, cit.
[27] B. HÖLLDOBLER, E. O. WILSON, *The Superorganism: the Beauty, Elegance and Strangeness of Insect Societies*, W. W. Norton and Company, London-New York 2009.
[28] D. SPERBER, *The Epidemiology of Beliefs*, cit., p. 30.