teorema
Vol. XXXV/3, 2016, pp. 219-232
ISSN: 0210-1602
[BIBLID 0210-1602 (2016) 35:3; pp. 219-232]

NOTA CRÍTICA/CRITICAL NOTICE

What is it Like to Be a Human Being? Language Design and its Implications for the "Human Nature" Debate

Guillermo Lorenzo González

What Kind of Creatures Are We?, by NOAM CHOMSKY, NEW YORK, COLUMBIA UNIVERSITY PRESS, 2016, 167 pp., € 26.00.

I. INTRODUCTION

What Kind of Creatures Are We? [*WKCAW?*] is the kind of book that Chomsky periodically publishes as an update of his core ideas concerning the nature of language and cognition, as well as his main tenets as a philosopher of science and as a politologist. Many of these ideas have remained unchanged throughout Chomsky's sixty-year-long career, so the book inevitably contains a good deal of motives that are redundant with similar previous efforts (in some cases, almost literal repetitions). In any event, the book may serve to newcomers as an abridged (somehow elliptical) but particularly persuasive mode of presentation of Chomsky's everlasting themes. As for connoisseurs, it may offer the opportunity of capturing which elements of Chomsky's theories and ideas are more vehemently defended today, while also apprehending which ones are now complementarily overshadowed. In this note, I will concentrate on parts of the book that concern linguistics and cognitive science, thus almost leaving apart those that relate to politics and history and philosophy of science – worth of a separate note. Namely, I will first present the two purportedly key language-specific components of the faculty of language according to Chomsky's image, attending to which an invigorated version of the internalist stance has lately arisen within the Chomskyan paradigm. In subsections corresponding to each of these aspects of language, certain

current assumptions associated to this 'new internalism' are subjected to critical inspection. In a brief concluding section, I explore some consequences of the resulting alternative image of language, were such criticisms on the right track.

II. Two Key Features of Language Design

Language exhibits, according to Chomsky's long held views, two main design properties that purportedly keep it apart from other dimensions of the natural world, each pertaining to a separate architectural level of organization. The first property is the infinite power of its combinatorial apparatus (technically speaking, its Computational System), in the sense that it endows speakers with the capacity of composing an infinite array of meaningful expression. This is the aspect of language that Chomsky has historically emphasized the most [see, to start with, Chomsky (1957)]. It is also the one on which he has based his personal affinities with a tradition that ranges from Descartes to Humboldt, of which linguistics proper seems to have been unaware until the mid-20th century [Chomsky (1966)]. The second property has to do with the character of the 'atoms' that provide the basic input of such combinatorial processes, which show the property of being 'reference free', and so in more than one sense: on the one hand, they may work in the absence of any referential link to reality (names for imaginary beings, places, and so on); on the other hand, their meanings routinely consist of the superposition of perspectives that, taken together, do not correspond to any circumscribable aspect of reality (as in the case of concepts as common as "city", "house", "person", etc.) [see, for example, Chomsky (1975) for detailed comments]. Both properties seem to be extremely rare in other organisms, if not right away unknown; if considered together, then language seems to be indisputably an exception in the organic world [Marler (1998), Hauser and Fitch (2002), Hauser et al. (2002)].

II.1. *The Basic Property*

In *WKCAW?*, p. 4, Chomsky refers to the first of the design features above as the Basic Property, in a way somehow reminiscent of Ferdinand de Saussure's First Principle, the name with which the founder of modern linguistics designated the arbitrary character of sound/meaning connections [Saussure (1916)]. Certainly, both properties fulfill the same cornerstone role in the respective frameworks. However, Chomsky's 'basic' category is in way deeper than Saussure's 'first' counterpart. For

drawing inspiration from Joseph Black's first principle of chemical affinity in the eighteen century, and even from Newton's law of universal gravitation [*WKCAW?*, p. 106-107], Chomsky is above all trying to pinpoint that despite the resistance of said property to be explained on neuro-scientific grounds—as witnessed in recent reviews like Dehaene et al. [(2015)], one cannot dispense with it but at the price of completely distorting a serious image of what language is. So Chomsky's Basic Property is 'basic' in the deep sense that it has the potential of forcing us to revise our conceptions of the brain workings at a flesh-and-blood level of analysis. Against this background, Chomsky's now almost thirty-year-long 'minimalist' project [Chomsky (1995), but see already Chomsky (1989)] may be interpreted as long-run effort to tame the Basic Property, under the assumption that despite the potentially extraordinary complexity of its outcomes, the Computational System may be reduced to an unexpectedly simple mode of operation. Such a reduction should eventually lead to an easier integration of the hypothesized core computational unit of language into our understanding of cognition, eventually saving for the most part own present conceptions about how the brain works.

According to Chomsky [*WKCAW?*, p. 16*ff*], the Basic Property follows from the extremely elementary operation that subserves the Computational System (Merge). Merge is a pairwise combinatorial procedure, which takes two items (X, Y) to create a third new item Z, namely an unordered set {X, Y}, where X and Y remain unmodified. As an illustration, think for example of the operation as merging a verb and an event argument – Merge (arrive, yesterday) – to yield the set {arrive, yesterday}, upon which no linear order is fixed by the operation – so {arrive, yesterday} = {yesterday, arrive}. The same procedure may further operate on the new item, merging it, for example, with an external argument – Merge (who, {arrive, yesterday}), yielding again a new unordered set {who, {arrive, yesterday}}. After merging this new item with a tense operator, capable of binding its event argument, the new unordered set {did, {who, {arrive, yesterday}}} is created. At this point, the operation may apply again, but this time merging the new set with one of the items composing it, thus creating the unordered set {who, {did, {who, {arrive, yesterday}}}}, where a scope taking operator becomes able to bind a copy of itself.[1] Chomsky's position is that Merge is elementary – i.e. the easiest operation conceivable for a brain to deal with, in the sense that it is fully respectful of an overarching principle that he dubs Minimal Computation [*WKCAW?*, p. 18]: namely, Merge operates pairwise (not thrice-wise or any other x>2-wise whatsoever); it does not manipulate

objects beyond their being put together; it does not put aside any possible source of units for computation – i.e. either items taken form the lexicon, already formed sets, or parts of already formed sets; and so on. This Minimal Computation principle thus may be also deemed responsible of the Basic Property, in that the former dispenses the system with incorporating any instruction of sorts constraining the range of application of Merge.

From the consideration that iterative applications of this combinatorial procedure are apt to create meaningful sets corresponding to well-formed logical expressions – in the case at hand, an operator/variable dependency ranging over an event-type predication, Chomsky derives the conclusion that the Basic Property specifically pertains to 'language' understood as a thought-making tool, and consequently, that language 'proper' – or 'language in the narrow sense'; see [Hauser et al. (2002)] – is a kind of language of thought (LOT; but not exactly in Fodor's sense)[2] to which externalization mechanisms are ancillary (or secondary) procedures [*WKCAW?*, p. 13]. Such a conclusion is also sustained attending to the fact that the defining signature of externalized expressions is linear order – or Saussure's [(1916)] Second Principle, which is a property completely alien to the logical content of thoughts and unsurprisingly, also to the outcomes of Merge (see above). Furthermore, it is presently a well-established fact that languages do not have a mandatory externalization channel – as witnessed by the hundreds of sign languages spoken by deaf communities, while them all serve to express the same kinds of thoughts.[3] Chomsky's invigorated internalism, which may now be epitomized with the formula 'language proper = LOT', thus seems to rely on very solid grounds.

Against this background, Chomsky further contends that a Computational System obeying to Minimal Computation – as witnessed by the Basic Property, is the better clue that language is mostly shaped from laws that are not language-specific or human-specific – not even specific of organic matter at large, in full completion of his Strong Minimalist Thesis (SMT). Language appears to be modeled by the same kinds of principles that self-sufficiently lead to optimal or perfect designs – say, that of crystals, snowflakes, and so on – across a broad range of organized matter [*WKCAW?*, p. 11 and 25]. In any event, Chomsky qualifies this strong claim by adding that underlying these extremely general, spontaneously driven principles of organization, a residue remains that may be properly conceived of as "the genetically determined character of language – UG" [*WKCAW?*, p. 11]: namely, a bare architectural blueprint

that prefigures the division of labor model comprising a core computational unit plus an interface with the thought module that provides atoms for computation [*WKCAW?*, p. 20]. This is how Chomsky keeps defending today that the human brain incorporates a minimal but far reaching language-specific component, completely unknown in any other corner of the organic world.

On strict minimalist grounds, however, Chomsky's position should be further radicalized, leading to some non-trivial corrections of the 'language-specificity' thesis. Let us think, for example, of the long held views of Patricia Greenfield [Greenfield and Schneider (1977), Greenfield (1991)], according to which tree-like patterns exhibiting the kinds of hierarchies and discontinuous relations typical of linguistic expressions are also observed in constructive activities and tool use by humans. Besides, parallel developmental paths are observed in the above mention areas, which paves the way to the reasonable conclusion that "a common neural substrate (roughly Broca's area) underlies the hierarchical organization of elements in the development of speech as well as the capacity to combine objects manually, including tool use" [Greenfield (1991), p. 531].[4] In other words, that a shared (thus not language-specific) system of computation putatively subserves the corresponding areas of cognitive activity. Moreover, Merge minimally defined as a set construction procedure – thus alien to internal hierarchy and external linearization concerns, automatically becomes the most suitable to also account, for example, for the processes underlying birdsong [Balari and Lorenzo (2105)]. In our present state of knowledge, this alternative to Chomsky's preferred view is no more than a conjecture. But the same must be said to Chomsky's position as well. In any event, the former ('language-unspecificity' thesis) is obviously much more compatible with the SMT than the former, so it should be the first to be incorporated into our theoretical view of language and explored by whatever means at our reach.

In a sense, such a theoretical move does not refute the language-specificity thesis, for the locus of specificity could still be assigned not to the Computational System proper, but to the interface with the thought module or to the store of thought atoms itself (or both). The next subsection is devoted to the latter subcomponent, so let me briefly refer now to the former alternative. The truth is that on either speculative or empirical grounds, the contention has been made that cognitive systems of animals other than humans entail interfaces making possible the elaboration of meaningful combinations of atomic pieces. The idea is suggested in Scharff and Petri [(2011), p. 2126] as regards songbird, and

purportedly attested in Ouattara et al. [(2009)] as regards some monkey's alarm calls, to cite just two examples. Assuming that such interpretations are on the right track – which, granted, is not straightforwardly obvious, then the thesis of the language-specificity of the 'computational system-thought' interface would also find itself in critical condition. But note that contrary to Chomsky's own penchants, such 'crisis' should be welcome as good news with respect to the SMT.

II.2. *The Atoms of Computation*

The second, not less intriguing feature of design that seems to keep language apart from the organ constitution of other species at a cognitive level has to do with he kinds of units that the Computational System processes – the 'atoms of computation', in Chomsky's preferred expression. As for what does he exactly mean when using such expression, Chomsky clarifies that the atoms of computation roughly correspond to word-like objects, save for the fact that they are devoid of associated phonological forms – which correspond with an independent and secondary matter of externalization [*WKCAW?*, p. 41]. Note that the atoms of computation may be alternatively associated to different phonological realizations, or not realized at all – as in the case of so-called 'empty categories', while still being capable of corresponding to single atomic components within the outcomes of computational processes. Thus they are essentially objects for thought, reinforcing the view of language as a thought-construction internal device. What basically seems to be quite different about them "from anything found in systems of animal communication", is that the kinds of units proper of these latter systems appear to be "linked to entities that are extramental and can be identified independently of any consideration of the symbolic system itself" [*WKCAW?*, p. 41]. Such a contrast straightforwardly seems to make them qualitatively very different from the atoms of linguistic computation (see above).

Let me start noting that it does not seem to make too much sense taking animal communication as a reference point in this regard, once Chomsky introduces the contention that 'communicative uses' are unsubstantial in order to gain a scientific image of language. Actually, Chomsky stresses this point in different passages of the book, in which he claims, for example, that communication "remains a minor part of actual language use" [*WKCAW?*, p. 16]. If language is, mostly and above all, "an instrument of thought" [*WKCAW?*, p. 16], then relevant comparisons should rather target other aspects of animal cognition – say, spatial navigation, constructive abilities, etc., the atoms of which could eventually show

the designated property. After all, a "path" to be followed or a "nest" to be constructed – if such categories exist in the animal mind –seem to belong to the category of entities that are primarily mental and independent of their being brought to completion. In any event, this comparative issue is not the main concern that I want to raise regarding this subject matter. Let me focus instead on the property itself that Chomsky pinpoints as the definitional feature of the atoms of computation – i.e. their intrinsically mental and reference-free mode of existence.

In *WKCAW?*, Chomsky refers to this property of atoms as raising independent concerns and asking for different explanations than those of the Basic Property. However, it is not difficult to grasp a link common to both motives: namely, linguistic expressions are doomed to gain the same reference-free status for the very fact that the constructive procedure acts unboundedly – think of the (in)famous *Colorless green ideas sleep furiously*, to begin with, and of the infinite array of sentences that can contain it as one of their constituents. Chomsky is obviously aware of this connection, as witnessed, for example, in the first section of his [(1966)], where both aspects of language are connected under the Humboldtian label of 'creativity'. So one may feel tempted to go further and try to offer a single unitary explanation to both features. In that case, if one keeps accepting Chomsky's suggestion that the property is 'basic' primarily of the system of computation, then a reasonable conjecture is that atoms obtain the property from the same source than expressions: for concreteness, that they are, so to speak, 'frozen' or 'fixed' outcomes of the same Merge operation that composes complex expressions.[5] 'Displacement' – in the sense of Hockett [(1960)] – thus follows straightforwardly at the atomic level.

Clearly enough, this move seems to run against serious objections repeatedly raised in Fodor [(1998)] and elsewhere. But I think that problems are less than insurmountable in this area. Fodor reasonably observes that the notion of 'atom' of computation ('symbol', in his own terms) should not presuppose the notion of 'computation', at the risk of the computational approach becoming circular. But an important qualification – made by Fodor himself – is that this circularity issue merely touches the problem of explaining how atoms/symbols attain their semantic properties. Consequently, one should not use the notion of 'computation' to explain how atoms/symbols acquire their 'semanticity' – i.e. according to Fodor, their being capable of being about the extramental world.[6] Attending to this, one may then conclude that the suggested explanation does not introduce any serious conflict to Chomsky's

approach, for according to Chomsky 'semanticity', in the intended sense, has nothing to do with computation, not even with language, because 'reference' is just a question of 'use' in real settings and by means of 'systems of action' other than language proper. According to this point of view, then, the etiology of symbolic reference is a problem different and independent from the problem of the etiology of the symbolic units as atoms for computation, which according to Chomsky happens to be just a question of internal syntax [*WKCAW?*, p. 48].

Therefore, the contention may be safely held that the richness of the atoms of computation (say, units like "homicide", "suicide", "infanticide", etc.), with their multifaceted structure and mutual inner relations, is just the consequence of applications of Merge that *somehow* (not a trivial qualification) become frozen and stored. An interesting congenial suggestion along these lines is advanced in Boeckx [(2011)], where a property referred to as 'lexical envelope' is introduced, which entails a further computational operation of 'enveloping'. We may think of this operation as responsible of 'compiling' the outcome of certain applications of Merge and gearing them apt for standard (i.e. ephemeral) uses of Merge [see also Longa et al. (2011), for a similar approach].

If the ideas of the previous paragraphs are on the right track, then similar considerations to those in the last paragraph of the previous section follow: namely, that it is not so straightforward that the distinguishing features of the atoms of computation are due to causes unknown in corners of nature other than language, for Merge is purportedly not an 'exception' of the human mind.[7]

III. Concluding Remarks

There exists a tension in Chomsky's approximation to language between his long-standing defense of UG and his more recent embracing of SMT as the main guiding methodological principle of linguistic theorizing. On the one hand, the latter (SMT) favors the attribution of the simplest form conceivable to language, unless empirical rebutted; on the other hand, the former (UG) favors the attribution of a residue of unreducible complexity, at the risk of the idea of language loosing any clear naturally evolved correlate. Chomsky (2013), pp. 34-37, refers as the 'non-existence' thesis to the contrary tenet that 'language' actually happens not to exist, for what the label names is just a constellation of cognitive capacities, simultaneously serving other functions as well (thus not

language-specific) and also accessible to varying degrees to other species (thus not human-specific). Chomsky's reaction against such a scenario is based on the premises that (1) without a minimal UG – i.e. a human and language-specific genetic endowment [*WKCAW?*, p. 20], linguistic variation would be unconstrained, and that (2) the task of discovering grammars from highly impoverished data would also become completely unfeasible – against all evidence in both cases [*WKCAW?*, pp. 11-12]. Inborn structure is strongly entailed for both concerns – according to Chomsky, and only some genetically encoded and task-specific guidelines appear to be apt to fulfill such a role, very much in the same way that a task-specific genetic tool-kit guides the development of the superficially diverse but highly constrained evolved body patterns. "To deny the existence of UG – Chomsky concludes [*WKCAW?*, p. 21] – would be to hold that it is a miracle that humans have language but other organisms do not".

Chomsky's position is not so straightforward, however. On strict biological grounds, it is a downright wrong assumption that one is holding a purely nominalist conception of 'language' if one does not support the human-specificity thesis. 'Language' – or 'language-as-an-organ', for the sake of clarity – may prove to be a non-human specific capacity – clearly a matter of discovery, and nevertheless exist. The problem that seems to obscure things here is that Chomsky confounds the 'specificity' issue with an issue of 'identity', which obviously enough are different concerns. Shared organs obviously exist; and as a matter of fact, most organs are shared. Whether language has or has not introduced a new kind of organ identity in the natural world is an issue of the highest interest [Balari and Lorenzo (2015)], but the 'existence' thesis [Chomsky (2013)] may resist the conclusion that it has not. If it has not, then it just happens that language is a 'homologue' of some preexistent organ identity.[8]

According to current theorizing on the 'homology' concept, homologues share a common background of constraining developmental factors, namely a shared network of genetic regulatory machinery – or 'character identity network' [ChIN; Wagner (2014)], which in any event does not prevent homologues to vary (non-trivially) both in formal and functional terms, just as conceived of by Richard Owen in 1843. That variation may be non-trivial is actually captured by Wagner's (2014) 'variational modality' concept, suited to those cases where particular homologues notoriously depart in morphology or activity patterns, while still constrained by a shared ChIN.[9] Language could prove to be a variational modality in this sense – i.e. a conspicuously diverging variant of an organ, yet present in the organ composition of other species [Balari and

Lorenzo (2015)]. Language could be special, compared for example to birdsong and other primates' calls, in the specific cognitive modules that its core computational component interfaces, as well as in the relative power of the working memory resources that it supplies to the corresponding areas of mental activity [Balari and Lorenzo (2013)]; and still be a variant (namely, a variational modality) of the same (existent) organ.

Note that none of the observations above questions the main underpinnings of the Chomskyan approach to language – not its internalism, its computationalism, or even its nativism;[10] neither would it prevent the application of the minimalist methodology in order to tease apart different kinds of constraining factors on language design [Chomsky (2005)]. They just correct Chomsky's problematic equation between the 'language-specificity' and the 'existence' theses, which simply proves to be spurious. They also potentially soften the aim of making a better sense of language evolution without trailing 'exceptionalist' routes of explanation, a most welcome result if Chomsky's claim that this should be one of the salutary consequences of the Minimalist Program is genuine.

Departamento de Filología Española
Universidad de Oviedo
Campus 'El Milán'
C/Teniente A. Martínez s/n, E-33011, Oviedo, Spain
E-mail: glorenzo@uniovi.es

NOTES

[1] The resulting expression can thus be interpreted as a logical form roughly corresponding to "which x | x, person, at time e | e < today, arrive (x, e)". The illustration is mine.

[2] There certainly exists a tension between Chomsky and Fodor's [(1975, 2008)] LOT hypotheses. According to Fodor, languages are essentially codes connecting pieces of LOT with pieces of perceptible stimuli, while for Chomsky this is a secondary, non-definitional aspect of language. According to Chomsky, LOT is purportedly a much more linguistic entity than Fodor seems to believe. In one of Chomsky's [(2012)] interviews with James McGilvray, the contention is made that LOT is "the core that they [all particular languages] share" [Chomsky (2012), p. 72], which seems rather far away from everything Fodor has ever contended on the topic.

[3] A caveat is in order here. While it is true that linear order seems irrelevant for logical concerns (but not for pragmatic ones, a question that I will put aside

here), it is also true that grouping items within unordered sets is not enough for such concerns. "Hierarchy" is also required, as for example in order to establish scopal dependencies. The issue is put aside in *WKCAW?*, but touched in other places, like Chomsky [(2013)]. A possible solution (along the lines of Boeckx [2013]) is that it is a special semantic property of items themselves that determines that a new object Z formed after Merge (X, Y) is equivalent to one or another of X or Y, thus establishing an asymmetry between them – i.e. a hierarchy: for example, the temporal and interrogative operators are, given their logical status, the ones that project at the corresponding structural levels. Chomsky's preferred solution is however that of treating "projection/labeling" as a primitive operation of the Computational System [Chomsky (2013)]. If so, the door is open to the tenet that logical forms are not primitive, but derivative from a conspiracy of sorts between Merge and Projection, as defended in Hinzen and Sheehan [(2013)]. These are issues that locate at the very edge of current minimalist interrogations. For a discussion, see Boeckx (2015).

[4] Following Musso et al. (2003), Chomsky also pinpoints Broca's are as the critical site of the corresponding processes [*WKCAW?*, p. 11].

[5] A proposal along these lines is articulated, for example, in the program summarized in Hale and Keyser (2002), the central claim of which is that the lexical content of predicative units entails syntactic structures that respect the same constructive principles than syntactic structures proper.

[6] Fodor's literal claim is the following: "a computation is some kind of content-respecting causal relation among symbols. However, this order of explanation is OK *only if the notion of a symbol doesn't itself presuppose the notion of a computation*. In particular, it's OK only if you don't need the notion of a computation to explain what it is for something to have semantic properties" [Fodor (1998), p. 11; emphasis from the original].

[7] I leave as an open question whether 'enveloping', in the suggested sense, may then be deemed the ultimate locus of 'language specificity', as suggested in Boeckx (2011) – see also Ott (2009) for previous suggestions along similar lines. Longa et al.'s (2011) approach presents itself as more inclined to see the homologous 'compiling' operation as a precondition for language, not necessarily species-unique.

[8] Needless to say, Chomsky's claim that "there is nothing homologous [to language] known in the animal world" [*WKCAW?*, p. 39] just begs the question.

[9] The concept is thought to make sense, for example, of the distance between homologous structures like the tetrapod limb and the teleost fin.

[10] Not even UG, but restricted to its sense as a concept of comparative grammar. This is a salutary move, for reifying UG as a 'language acquisition device' capable of accounting for the highly constrained array of possible human languages entails transforming an *explanandum* into an *explanans* [see Longa and Lorenzo (2012)], a fallacy that has been previously criticized by Richard Lewontin as regards other areas of biology [see, for example, Lewontin (2000)].

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RESUMEN

Esta nota comenta el nuevo internismo chomskiano, que identifica la facultad del lenguaje con un lenguaje del pensamiento específico de dominio y específicamente humano. Ambas tesis de especificidad son sometidas a crítica. Aunque el resultado cuestiona el concepto clásico de GU, se sugiere que debería ser bienvenido como particularmente compatible con la llamada Tesis Minimalista Fuerte.

PALABRAS CLAVE: *facultad del lenguaje, lenguaje del pensamiento, programa minimalista, novedad, homología*

ABSTRACT

This note comments Chomsky's new internalism, which equates the language faculty with a domain-specific and human-specific language of thought. Both specificity theses are scrutinized. The result questions the classical concept of UG, yet it is suggested that it should be welcome as particularly fitted with the so-called Strong Minimalist Thesis.

KEYWORDS: *Faculty of Language, Language of Thought, Minimalist Program, Novelty, Homology*.