NOTAS CRÍTICAS/CRITICAL NOTICES

Un-Cartesian (Bio-)linguistics?

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The Philosophy of Universal Grammar, by WOLFRAM HINZEN and MICHELLE SHEEHAN, OXFORD, OXFORD UNIVERSITY PRESS, 2013, 400 pp., £ 60.00.

1. INTRODUCTION

Hinzen and Sheehan's Philosophy of Universal Grammar (hereafter, PUG) is an ambitious book. As they themselves write, "seen as a whole, this book reflects the ambition to rethink the place of grammar in human nature in all of its dimensions, and thereby to rethink its place in philosophy as well" [p. xix].

PUG is divided into three unequal parts: a first portion devoted to demonstrating the (alleged) explanatory limits of Cartesian linguistics, and introducing the alternative, "un-Cartesian" vision that the authors claim grew out of Hinzen (2006), (2007); a second portion dealing with concrete issues in linguistic theory (deictic markers, case, cross-linguistic variation), and a third, more "biolinguistic" portion that deals with issues like speciation and mental health. As the authors indicate on p. xx, Hinzen is primarily responsible for roughly parts I and III of the subdivision I just introduced, and these are the parts I will focus on here. My reason for focusing on these parts, leaving out part II, is not because the issues discussed therein are unimportant in the context of PUG, but it is because this is the part of the book where a certain lack of communication between the two authors is most obvious, making the integration with the rest of the book rather artificial.

The clearest example of this arises in the context of variation, and what to do with cross-linguistic variability in the context of the authors' "Un-cartesian proposal". The authors point out at the very beginning of the book that numerous scholars take the existence of cross-linguistic variation to be an argument against Universal Grammar (see, e.g., p. 7, 9, 247: "precisely the virtually unavoidable divergence between a (presupposed) system of 'concepts' and the variation in their external expression that has historically led linguists to reject Universal Grammar"). But, as the authors correctly observe [p. xviii]:

> … so we need to address the issue of cross-linguistic variation. Does it provide a challenge for our account of universal grammar? Not if the primary dimension of variation is the organization of language at a lexical and morphological level; not, if traditional dimensions of variation, as captured through syntactic parameters, are given their proper place in the grammar, as only affecting their sensory-motor externalization.

Not surprisingly, given my position on variation [Boeckx (2014)], I think that Hinzen and Sheehan are correct here. If cross-linguistic variation is relegated to the mapping to the sensori-motor systems, the match between syntax and semantics is ensured. But, as it turns out, one of the authors (Sheehan), in collaboration with Ian Roberts and others, is known for her claim that not all instances of variation are reducible to the sensori-motor interface [see, e.g., Biberauer, Roberts and Sheehan (2014)]. As one might have expected, in the very chapter on variation, the position argued for at the beginning of the book ("the primary dimension of variation is the organization of language at a lexical and morphological level") is replaced (without notice, I should say) by a quite different one: "a significant challenge facing the Un-Cartesian view is not that grammatical semantics might fail to be universal, but rather that it might fail to be grammatically specified" [p. 175]. The closing passage of the chapter of variation in PUG is quite telling:

> This chapter has considered linguistic variation and whether it affects grammar as described here. Grammatical semantics is rather uncontroversially universal; nor do the principles of reference and predication as described here form natural dimensions of expected variation, since the grammatical semantics in question is arguably conceptually non-distinct from the grammatical patterns in which it arises. Cross-linguistic variation could suggest that an alternative, non-grammatical system is what accounts for the formal ontology of semantics, but this does not seem to

be the case – that is, the syntactic variation most scrutinized in the generative tradition is not of that kind. Indeed, it turns out that the classic GB syntactic parameters might well plausibly be reformulated as PF-parameters affecting only 'externalisation' (morphological operations, vocabulary insertion, linearization). In particular, this may well be the case with the head parameter and the null subject parameter. In the case of alignment, we have seen evidence of a syntactic parameterisation based on the fact that ERG[ative] DPs cannot be wh-extracted or relativized in a diverse range of ergative languages. Following recent work, there may be a 'parameter of micro-parameters' to explain the attested classes of ergative languages and one-way implications. Crucially, the syntactic parameters in said hierarchy actually appear to have some semantic import, in which case a change in grammar does entail a change in meaning, as we would expect on the present view [p. 201].

It turns out, then, that syntactic parameters exist, at least for one of the authors of PUG, but if so, one would have liked to see an extensive discussion of how this meshes with the claim made at the beginning (and the main thrust) of the book. Far from resolving the issue, the treatment of variation in chapter 5 re-opens the can of worms that we had been told in the initial pages had been closed.

Unfortunately, as we will see below, lack of consistency across chapters is not confined to the instance just discussed, and because they affect some of the most central claims of PUG, they cannot be dismissed as the result of poor final editing.[1] Nor can they always be attributed to diverging views between the authors, I believe. Rather, they seem to me to emerge from some of the cracks at the very foundation of core statements of the so-called Un-cartesian view, and so deserve to be scrutinized, as I attempt in this review. This will have the added benefit of allowing me to shed light on the nature of the biolinguistic enterprise, and on the broad range of topics on which PUG touches, which biolinguists must engage with.

The remainder of this review will deal with the following issues: Chomsky's "Cartesian" position on the relation between language and thought, the cognitive specificity of Homo sapiens in light of what we know about other species, both extinct (the neanderthals) and extant (e.g., primates), the role of lexical units in grammar and the evolutionary novelty that is human language, and the nature of cognitive/linguistic disorders.

II. (Un-)Cartesian-ism

Let us begin with the "central thesis" of PUG: "That grammar is a distinctive way of organizing meaning and thought, making knowledge possible" [p. 1]. As Hinzen and Sheehan observe, "versions of this idea are as old as human scientific inquiry into grammar itself", but crucially, they don't see this vision reflected "as clearly, or indeed at all, in the Port Royal tradition, or in its modern incarnation", by which they mean Chomsky's "Cartesian" linguistics. This Cartesian tradition, they claim, takes "thought [to be] universal and structured by logic, while grammar is a conventional system for expressing it materially" [p. 4]. Hinzen and Sheehan takes this separation between language and thought to be a constant of Chomsky's reflections on language over the years, from the early days of Aspects and Cartesian Linguistics, right up to the present ("The Strong Minimalist Thesis of Chomsky (2007) and the comparative approach of Hauser et al. (2002) are both based on the view that we need not account for thought", p. 6). The fundamental contrast, then, between the Cartesian view and the so-called "un-Cartesian" view is, according the PUG, the contrast between a view that takes "the grammar [to] merely internally articulate [thoughts], giving them a linguistic form", and another view, according to which grammar "fundamentally changes and re-organizes [cognitive] systems, thereby giving us a different mode of thought, if not thought as such" [p. 6].

Hinzen and Sheehan point out that this Cartesian tradition is in large part responsible for why the notion of a "universal grammar" has proven so hard to accept: "prima facie it remains hard to imagine how or why an expressive tool should be universal or biologically 'hard-wired', rather than a mere convention" [p. 14]; (curiously enough, the authors of PUG don't discuss animal communication systems, such as birdsongs, for which a similar question could be raised, and yet there is no doubt that such expressive tools are biologically hardwired).

The authors also point out that "contemporary cognitive or functional linguistics shares the rationalism [/cartesianism] of the Port Royal tradition, insofar as language on this account is there to communicate thoughts, but a theory of thought is missing" [p. 32]. In doing so, Hinzen and Sheehan ironically lump together Chomsky and some of his most stubborn critics ("We thus conclude that UG in the generative tradition and today's major anti-UG paradigms share Car-

tesian assumptions" [p. 248]). I write 'ironically', because it is often pointed out that Chomsky has consistently argued against the claim that language is a communicative tool, stressing as early as *Cartesian Linguistics* (1966) that language is much more intimately connected to thought. Hinzen and Sheehan seem to be aware of this, as they write that "the Cartesian rationalists cited in Chomsky (1966), who hardly saw a difference between grammar, insofar as it is a science, and thought. Chomsky (1966) himself, however, citing the rationalist Beauze saying that 'the science of language differs hardly at all from that of thought', particularly stresses the need for what we may call a restrictive and explanatory theory of semantics" [p. 13]. Elsewhere [p. 6], they in fact confess that "some statements of Chomsky are consistent with this [un-Cartesian] perspective, such as the assertion that 'UG primarily constrains the 'language of thought', not the details of its external expression'" [Chomsky (2007), p. 22]. "Consistent" is a rather odd adjective to use in this context, as surely Hinzen and Sheehan must be aware of passages like the following in Chomsky's writings: "Emergence of unbounded Merge in human evolutionary history provides what has been called a 'language of thought', an internal generative system that constructs thoughts of arbitrary richness and complexity, exploiting conceptual resources that are already available" [Chomsky (2009), p. 29, written in 2006, and numerous passages along these lines since then].

So, is Chomsky's position Cartesian or un-Cartesian? It's actually unclear if the question makes any sense. Part of the problem lies in the fact that "Cartesian linguistics" (and, therefore, "Un-Cartesian" linguistics) has always been ill-defined. As Chomsky himself readily acknowledged: "I should say that I approach classical rationalism not really as a historian of science or a historian of philosophy, but from the rather different point of view of someone who has a certain range of scientific notions and is interested in seeing how at an earlier stage people may have been groping towards these notions, possibly without even realizing what they were groping towards. So one might say that I'm looking at history not as an antiquarian, who is interested in finding out and giving a precisely accurate account of what the thinking of the seventeenth century was – I don't mean to demean that activity, it's just not mine – but rather from the point of view of, let's say, an art lover, who wants to look at the seventeenth century to find in it things that are of particular value, and that obtain part of their value in

part because of the perspective with which he approaches them"
[Chomsky (1971)]. (As far as I can see, Hinzen and Sheehan do not
depart from Chomsky's goal, given that they do not provide very ex-
tensive discussions of un-cartesian thinkers of the past in PUG in a
way a historian of science would be expected to.)

This point is reiterated in McGilvray's extensive introduction to
the re-edition of Cartesian Linguistics [Cambridge UP, 3rd edition,
(2009)]. McGilvray, in fact, suggests we replace the adjective "Carte-
sian" with the broader "Rationalist-Romantic" notion. I prefer this
broader characterization as well. As a matter of fact, this conjunction
of rationalist and romantic perspectives may well render the Carte-
sian-un-Cartesian contrast meaningless, if we take into account that
the mirror was the favorite metaphor of the rationalists, and the lamp
that of the romantics [Abrams (1953)]. Thus, whereas the rationalists
may have liked to study language as a mirror of the mind (cf. Leib-
niz), the romantics may have preferred to say that language could be
studied to shed light on the nature of thought. In the end, the mirror
metaphor should not be seen as implying a sharp dividing line be-
tween language and thought (as Chomsky's "Cartesian" stance above
makes clear). The image of the mirror is best thought of as a strategy,
which Joan Bresnan (2011) captured well when she wrote that the
goal of [Chomskyan/Cartesian] linguistics was to " to infer the nature
of the mind's capacity for language from the structure of human lan-
guage" [p. 1]. The real separation is not between the mind and the
language faculty, but rather, between the linguistic systems linguists
use, the data available to them, and the mental capacity they reconstruct
from them, seeing this capacity (partially) "reflected" in the patterns
from the data, as in a mirror.

In this sense, Hinzen and Sheehan's position is Cartesian as well,
since they separate the variation they find in language from the univer-
sality of grammar. It is in fact no surprise that Chomsky's claim that the
language faculty is essentially Homo sapiens's language of thought
have surfaced in the clearest of terms once progress in linguistics has
made it possible to contemplate the possibility that all of linguistic vari-
ation can be confined to the morpho-phonological component [Boeckx
(2001a), (2014), Berwick and Chomsky (2011)]. The thought/language
dualism that PUG takes to be at the heart of the Cartesian tradition is
in large part replaced by keeping a sharp distinction between syntax
and morphology (or s(yntax)-syntax vs. l(exical)-syntax, to use Hale

and Keyser's (1993) apt terminology), a position argued for as early as Otero (1976), and re-emphasized in Boeckx (2014).

I write 'in large part' because Chomsky's position is not that language = thought. At times, Hinzen (2006), (2007) and Hinzen and Sheehan write as if this equation holds, and Chomsky very clearly disagrees here, for good reason. As he writes in Chomsky (2007), p. 15, where Hinzen's project of deflating the standard independent semantics/Conceptual-Intentional component [Hinzen (2006), (2007)] is discussed, "satisfaction of independent conditions [imposed by a Conceptual-intentional component] cannot be entirely eliminated. [The Conceptual-intentional component] must have some range of resources that can exploit the properties of the generated expressions". As I wrote in Boeckx (2014), I think that this is a point Hinzen does not always appreciate in his writings, including PUG. The issue is essentially a Darwinian one. As Lenneberg (1967) pointed out, "no biological phenomenon is without antecedents" [p. 234]. Evolutionary novelties must be understood in a context of descent with modification. No matter how specific one thinks sapiens thought is, it must be embedded within an inherited conceptual-intensional system. I take it that this is essentially the message of Hauser, Chomsky, and Fitch's (2002) Faculty of Language in the Broad Sense, and so disagree with Hinzen and Sheehan when they write that Hauser et al. don't provide a "theory of thought" [p. 32]. At the very least, they tell us where to look (i.e., the cognitive resources of animals, which ultimately provide the substance for the "systems of thought that use linguistic expressions for reasoning, interpretation, organizing action, and other mental acts" [Chomsky (2009), p. 19]).

Hinzen and Sheehan would object to this, as they repeatedly stress that we can't derive any property of our distinct mode of thought from the study of other species: "evidence from non-linguistic beings for such capacities is precisely absent" [p. 246]. But what is the alternative? Although Hinzen and Sheehan insist that "The story we tell, by contrast, is an explanatory one. It provides an etiology for it: a rationale for why it exists, and has the features it does" [p. xix], claiming that properties of thought reduces to properties of grammar is explanatory only insofar as the properties of grammar are well understood and justified in the first place. Which properties of grammar are at issue? Ironically, PUG has very little to offer here. It appeals to grammar on every page, as if the ontology of grammar had

been settled, but it has not. Indeed, a central aspect of the biolinguistic enterprise is to precisely ground grammar onto biology. Hinzen and Sheehan emphatically disagree (I return to this point shortly), but it then behooves on them to provide the grammatical foundations of grammar. Personally, I am skeptical for reasons detailed elsewhere [Boeckx (2014)]. Currently, grammatical notions are based on properties like categories, features, types, and the like. But these tools have been devised to 'get the facts'. The explanatory depth of such account is far from remarkable (think of the standard definition of a Noun as a [+ Noun] category), and this is precisely what ultimately motivates the minimalist and biolinguistic enterprises. In other words, there is currently no non-stipulative theory of grammatical substance, and yet PUG proceeds as if we have one. Appealing to phases or categories won't do, until we are given a theory of these objects. If we are not, we cannot claim that these provide a "theory of thought", in the strong sense of theory. At some point, p. 31, Hinzen and Sheehan write that "Like the Indian grammarians, Modistic grammarians had a 'substantivist' take on grammar — not a formalist or minimalist one. It is not a feature [the 'edge'-feature in Chomsky, (2008)] that allows a word to enter a construction, but a mode of signifying". But eventually the causal chain of explanation must be broken. If it's not a feature that defines a grammatical category, but a mode of signifying, and if we say that we have the mode of signifying we do because of the grammatical categories we have, what provides the foundation to what? Chickens and eggs indeed.

It should be said, of course, that PUG in large part resists the Darwinian logic of descent with modification as a matter of definition. Thus, it states [p. 9] that "grammatical categories are sui generis, a genuine innovation in hominid evolution, reflecting a new mode or format of thought that did not pre-date grammar" because it defines our mode of thought in grammatical terms. "Prospects for finding evidence that such a semantics – in essence, all of thought as it is manifest in the semantics of human languages – is present in non-linguistic systems of thought appears slim" [p. 97]; "language and (at least one particular kind) of thought may be integrally related" [p. 283]; "Reference in non-linguistic animals takes a completely different form (and may well be explainable causally). Intentional reference, in the human sense, involves language, and it needs to be explained linguistically, not semantically" [p. 42]; [grammar] "fundamentally changes and re-

organizes [cognitive] systems, thereby giving us a different mode of thought, if not thought as such" [p. 6], "grammar is the world as known: experience converted into knowledge, or knowledge in a uniquely linguistic format" [p. 296].

PUG does not, of course, deny the existence of thought in other species ("None of this takes the point away that perception in pre-linguistic cognitive systems can involve classes of considerable abstraction" [p. 38]; "it is still the case that general intelligence – in the sense of smart adaptive behaviour involving inference or 'reasoning' (thought in a generic sense) – is not our topic here. Many non-human animals are fabulously smart, not to mention hominids other than Homo sapiens" [p. 248]), but it often goes on to say that whatever thinking animals have, it does not warrant the true label of "thinking" because that is only specific to us, depending as it does on grammar: "What we are talking about, then, when we talk about UG or the evolution of language is, effectively, the evolution of our mind and the thinking that takes place in it, insofar as that thinking is unique to us" [p. 248]. "Thought in non-linguistic species, if it exists, is thought with no awareness of it; thought that has no concept of itself, a concept that requires, and is a reflection of, having language" [p. 259]. "This begins to make sense if we are right that the connection with thought is essential to language, and makes us conscious of the fact that we think, giving us a concept of thought, which nothing else can" [p. 260]. "Reference in non-linguistic animals takes a completely different form (and may well be explainable causally). Intentional reference, in the human sense, involves language, and it needs to be explained linguistically, not semantically" [p. 42].

The circularity I am trying to highlight here receives its clearest expression in this passage: "A structured formal semantics, mediating a perception-action circuit, is thus here in place long before language arrives on the evolutionary scene. Ipso facto, a semantics of this kind will not tell us what is special about language or the organization of meaning in it — our basic question here" [p. 38].

III. UN-CARTESIAN BIO-LINGUISTICS?

PUG's insistence on the uniqueness of human thought makes it particularly hard to tackle what one might call "Darwin's problem"

(evolutionary origin). But PUG also contains some puzzling passages concerning what one might call "Broca's problem" (brain implementation). Consider the following:

> Pre-Port Royal, we see that the project of a science of language is set up in a very different way. It is not premised by the naturalistic context of a 'biolinguistics' or the naturalism of the computational theory of mind, in which mental activity is described as the manipulation of formal symbols implemented physically in the brain, connected on standard views to the world via a causal relation of 'reference' [Fodor (1990)]. On the contrary, grammar is a science in its own terms – not in biological or computational ones. It is science because it organizes a domain of knowledge that the Indians first realized has a systematic structure to it that can be described formally and algebraically in terms of rules [p. 33-34].

> From this point of view the enterprise of biolinguistics – at least under one standard way of construing it – is as problematic as is the search for a 'biomusic' or a 'biomathematics', if this means that music or mathematics should be studied in biological terms. They should not. In fact, the opposite may be true: (some aspects of) biology should be studied in musical, grammatical or mathematical terms [p. 32].

> Grammar, in short, may itself be foundational, rather than being founded upon something else [p. 87].

> The ontology of our theory of the propositional forms of reference is grammatical. Calling it psychological adds nothing to our problem, and we do not see how we can go deeper than grammar, laying a foundation for grammar itself [p. 303].

> Coming back to the beginning of this chapter, however, we have not been talking psychology, but grammar, and we have endorsed no such view as that grammar is 'internal'. The existence of grammar requires a sapiens-specific brain, but this does not make grammar internal or non-objective [p. 327].

> …no account of thought can be 'internalist', or purely psychological. But this does not mean it cannot be grammatical [p. 336].

And yet, elsewhere in PUG, Hinzen and Sheehan write that

> What we are talking about, then, when we talk about UG or the evolution of language is, effectively, the evolution of our mind and the think-

ing that takes place in it, insofar as that thinking is unique to us. There is such a thing as biolinguistics because (i) there is no non-linguistic biological adaptation that can substitute for language, and (ii) the grammatical organization of language reflects a new mode of thought defining a new species, because it defines its mind" [pp. 248-9]

Normativity in this sense, then, is again not due to environmental influences or conventional community norms, but depends on a specific cognitive system, language. It is the result of having a linguistic mind, not what creates such a mind. If we include language within biology – viewing language as a natural object, a subject matter of biology – then this final normativity is again grounded in biology [p. 335].

As we will see below, a good chunk of PUG is devoted to clinical issues revolving around mental health, where the discussion occasionally touches on aspects of the brain, the genome, etc., where biology appears to dominate. So, at the end of the book, the reader is left with the following question:

There is, in short, ..., no biology specific to language — no UG rooted in the human genome, no biolinguistics in the original sense of Chomsky (1957) and Lenneberg (1967). But is it therefore true that language simply doesn't matter to biology? That there is no such thing as biolinguistics altogether? [p. 242].

I feel incapable of figuring out what the authors of PUG would answer to this question, based on the material quoted above.

IV. SPECIATION

Before turning to the issue of mental health, I'd like to briefly address another 'biological' concern that Hinzen and Sheehan see as central, the issue of speciation. As the authors of PUG write,

The connection between universal grammar and species-specificity has always been an important part of the biolinguistic program from the outset, as is clear in Chomsky (1957); (1959); (1965) and Lenneberg (1967) [and see Bickerton (1990)]. But it is only in the last two or so decades that archaeological evidence has strengthened showing how tight, actually, the connection between language and speciation is [p. 239].

And they too view "the evolution of language [a]s inseparable from the evolution of a particular mental phenotype" [p. 239]. Indeed, "To a significant and surprising extent, then, the evolution of language is the evolution of our species, whose genotype is a linguistic one" [p. 239]. (Notice here how we've entered the realm of biology by bringing up the genotype).

There are, I think, four things to object to in PUG's treatment of speciation, one minor, but three major, which I will highlight here. The minor issue has to do with the centrality of the speciation problem in biology. It is my impression that biologists have long dropped the belief that it is important to provide the defining characteristics of a "species". There are just too many possible ways to define what a species is. As Hinzen and Sheehan write "Hinzen (2006) proposes to view the theory of UG as an instance of 'internalist' or 'generative' biology in this sense, applied to language: an account of the generative principles that give rise to new behaviours in humans. Yet Hinzen also leaves the connection with speciation largely out of account, and in a way, Evo-Devo does not make it a central topic either: it is continuous, in particular, with the stress of the 'rational morphologists' of the 19th century [Gould (2002)] on what they called the 'unity of type' — the existence of abstract structural templates (Bauplaene) that cut across different species operating under different adaptive regimes. In this sense, the reality, or at least the centrality, of species is denied here as much as it is in Neo-Darwinism" [p. 252]. Hinzen's (2006) position continues to strike me as the correct one, certainly the one more in line with current biological concerns.

As for the major issues I want to highlight, they pertain to the the notion of the "linguistic genotype" used in PUG, the at times very "Cartesian" definition of the linguistic species, and the treatment of neanderthals and their cognitive ability.

PUG's position is clearly stated on p. 238: "the specific symbolic mode of thought that we see manifest in all of the world's languages and most human cultures did not pre-date the evolution of language, as far as archaeological evidence from hominid material cultures suggests, as well as evidence from comparative cognition, as reviewed below.

The organization of the lexicon and the grammar directly yield the species-specific features of this mode of thought, in particular its propositionality" But what is the evidence for this statement? Curiously, PUG adopts a very Cartesian stance in this context:

…to evolve language in the human sense, we have to evolve the mind, which is expressed in it, and that mind doesn't come for free and evolves over evolutionary time [p. 244].

…the grammatical organization of language reflects a new mode of thought defining a new species [p. 249].

In the same way, language not used to express thought would not be called by the name of language [p. 258].

As the evidence base stands, the connection between language and the species boundary remains crucial, and even more so if our own species wasn't quite the species it would become, before it invented language as the sole appropriate medium of expression for a biologically novel mode of cognition [p. 260].

How ironic (and how very "Cartesian") to use language as an "expression" of mind/thought to make a case of an "un-Cartesian" position.

At any rate, this is by no means the most severe problem of PUG's treatment of speciation. Any account that relies on the idea that "the fundamental innovation that we see with the Cro-Magnons and their African precursors is that of symbolic thought, and this is something with which language is virtually synonymous" [p. 258] will have to come to grips with two major facts: one (recognized in PUG, though, as we will see, dealt with in a puzzling fashion — puzzling in the context of PUG, that is) having to do with the delay between anatomical modernity and behavioral modernity; and the other, the accumulating evidence that Neanderthals, taken to be a distinct species in PUG, were capable of symbolic thought. This evidence is not discussed in PUG (I have only been able to find a cryptic parenthesis hinting at "complications", not spelled out, on p. 257), and is even somewhat tacitly denied on p. 253, where neanderthals are said to be "crucially, now regarded to be a distinct species from any now extinct precursor hominid, an insight that simply did not exist in the late 1950s and 1960s, where Neanderthals were still widely regarded as simply an early variant of modern humans."

This latter statement is, however, quite problematic. Thus, Hinzen and Sheehan write that "the crucial kind of behavioural innovations that we associate with our species – such as symbolism, personal

adornment, elaborate burials and weaponry, and art – are manifest in the archaeological record only some tens of thousands of years later than anatomically modern humans appear on the African scene" [p. 254], insisting that "anatomical modernity" was not "accompanied by behavioural modernity" [p. 255] for a long time. While such a position would have been accepted 20 years ago, it looks hopelessly outdated now. In particular, it ignores the now well-established gradual emergence of behavioral modernity [McBrearty and Brooks (2000)] in the course of Homo sapiens' history in Africa, and it also ignores the numerous examples of symbolism in extinct hominins [Zilhão et al. (2010); Rendu et al. (2014); Rodriguez-Vidal et al. (2014)], some of which indeed used to be claimed to be unique to us. Numerous experts would surely object to the claim that "the difference that gave the Cro-Magnons an edge over the Neanderthal Europeans was surely not physical, but must have been largely cognitive" [p. 257]. Notice that acknowledging this does not mean that there are no key cognitive differences between Neanderthals and anatomically modern humans, but PUG certainly does not provide the means to identify those. At the same time, PUG fails to address the frequent objection that many instances of behavioral modernity can rarely be linked in a compelling fashion to language/grammar [on this point, see Balari et al. (2011)].

As I already pointed out, as a result of not taking the work of McBrearty and Brooks seriously into account, Hinzen and Sheehan are forced to stress the gap between anatomical and behavioral modernity ("the distinctive 'rationality' of hominin thought is something that can be dated, and there is no good evidence for its existence prior to that of modern Homo sapiens, or even in the anatomical beginnings of this species: for in this species itself, there is no such evidence before 75,000 years ago in Africa and 40,000 years ago in Europe, which is when a novel mode of thought is richly manifest in the unprecedented creativity of the essentially modern cultures arising then" [p. 7]; "it took well over 100,000 years before the first anatomically modern humans started to behave as members of our species do today", "In none of these cases is anatomical modernity accompanied by behavioural modernity" [p. 255]) and seek an explanation for it. But in doing so, they leave us with more than one contradiction. They write that "Perhaps, biologically and cognitively, the resources we needed were in place by the time anatomically modern human developed, but their fully human expression and behavioural manifestation had to

await a 'releasing factor' — some cultural rather than biological inno-
vation [p. 256].

But recall that "To a significant and surprising extent, then, the
evolution of language is the evolution of our species, whose genotype
is a linguistic one." If the key releasing factor was cultural, how are
we to understand the claim that our species' genotype is "a linguistic
one"? If the genotype, which for all practical purposes has not varied
since the origin of our species, is what underlies our grammatical abil-
ities, how can Hinzen and Sheehan claim that "grammar directly
yield[s] the species-specific features of this mode of thought" if at the
same time they claim that "In whatever sense humans before, say,
100kya were 'talking', therefore, this was 'talk' of a kind that wasn't,
as far as present evidence goes, paired with anything like a modern
human culture of the kind that we see in Cro-Magnon Europe after
45kya, and hence not evidence for a mode of thought that is manifest
in such a culture" [p. 260]. How can it be claimed that "A case there-
fore remains for biological and cognitive capacities distinctive of dif-
ferent human species, and ours in particular, even if, importantly,
these appear to need a releasing, perhaps cultural factor"?

Part of the problem here surely lies in the fact that if one insists
that grammar should not be studied in biological terms (but the other
way round), what does it mean to talk of a linguistic genotype: "our
account of thought is naturalistic — it takes our cognitive phenotype
as an object in nature that we can study as an expression of its linguis-
tic genotype" [p. 333]?

Consider the following passages:

This conclusion, which we will argue, in the final chapter, to be a nec-
essary one, would make sense of the archaeological record, for if the
earliest anatomically modern humans had a capacity for the relevant
mode of thought, there is no evidence, as we just saw, that they could
use it: language in the full sense, which includes externalization, was
both missing and needed, explaining the relative poverty of their cul-
ture. Put differently: these humans had a mind, of a new and spectacular
kind; but they didn't yet know it; and thus it isn't manifest in the mate-
rial cultures they created [p. 259].

When such thinkers become speakers, we can see that with language as
a shared medium, and an external world is shared as well in which

words are used, a baseline of objective meaning will arise against which judgements can be made [Ibid.].

Grammar does not mature in the individual — it is, factually, only a population-level phenomenon, even if the members of such populations, as is surely the case, individually need a sapiens-specific brain and the linguistic genotype to partake in this phenomenon. For this reason, too, our account endorses no internalist ontology. It is language in the social-interactive and population-level sense, where issues of reference arise: we do not point in the privacy of our own heads. Truth, too, is not a subjective phenomenon, or even an intersubjective one [p. 303].

If the aim of the book is to account for the tight connection between grammar and thought, why use the archeological record in the way PUG does to establish the late emergence of grammar, if it is claimed that "the capacity for the relevant mode of thought" was present early? Why appeal to "language in the full sense, which includes externalization", if the focus of the book takes variation/externalization out of the grammar = thought equation. Why focus on "speakers" in the context of speciation when "thinkers" are the focus of the main thesis of the book (grammar and thought, not speech and thought)?

V. Mental Health

The lack of clarity concerning the crucial "linguistic genotype" leads me to address the issues of mental health that figure prominently in the third part of the book. As I will make clear, I found it one of the most confusing aspects of PUG. Rightly (I think), Hinzen and Sheehan insist on a distinction between [p. 262] "crosslinguistic" and "biolinguistic" variation (a term they attribute to me, although my own view departs from theirs, given the problematic notions they endorse such as "linguistic genotype"); [see Benitez-Burraco and Boeckx (2014)]. According to them, "Speakers of different human languages do not differ with regards to their linguistic genotype" — a claim that is hard to test, given the problematic nature of such a genotype. The aim of that part of PUG is to reinforce the link between grammar and thought by showing that there is "co-variation between the mode of thought and that linguistic genotype" [p. 262], and that "thought fragments where and to the extent that grammar does" [p. 263].

Given the lack of precision concerning what is meant by grammar, I found it hard to evaluate this claim: what does it mean for grammar to "break down"? Does it mean that grammar users start using Determiners where one would expect Complementizers, Verb Phrases instead of Tense Phrases? On p. 263 we are given a hint: discussing a particular patient, Hinzen and Sheehan write that "her conceptual system is not like ours, and she doesn't understand when sentences are true or false" But is this a case of grammar breaking down? Even if someone does not understand when sentences are true or false, it is still the case that she understands that sentences are true or false (a distinguishing feature of Homo sapiens, according to PUG, or so I thought). Since when does grammar indicate when sentences are true or false? As Paul Pietroski, building on remarks by Noam Chomsky over the years, has stated on numerous occasions: truth is the result of an interaction effect, not solely a grammatical fact (see Pietroski, forthcoming).

Hinzen and Sheehan go on p. 264: "she had conceptual difficulties, and her use of 'syntactically and semantically well-formed utterances' often turned out to be 'factually incorrect', indicating a difficulty with [...] 'semantic knowledge'. Describing her 'syntax' as relatively impaired [as the literature does] thus raises an issue in the present dialectical context, when it is clear that part of understanding sentential grammar is to understand when (and in part also whether) particular sentences are true or false, or when something is a topic of which something else is a predicate."

But again, is this a sign of grammar breaking down? Does grammar really indicate when (and in part also whether) particular sentences are true or false? (Think of *colorless green ideas sleep furiously*.)

PUG revisits several cognitive and linguistic disorders in an attempt to identify those where grammar and thought co-vary. Much like they did at the beginning of the book, variation pertaining to the external component is excluded (even if this reassesses unresolved questions, as discussed above):

Much research on the range of language impairments in S[pecific] L[anguage] I[mpairment] has focused on morphosyntax and finite verb morphology in particular, where deficits are distinctly visible and highly characteristic. Yet, the question of whether these affect grammar or

> primarily its externalization in overt morpho-phonology is an open question.
> If grammatical meaning is unimpaired, this might suggest that deficits in SLI are not so much deficits in grammar or language proper as deficits in its externalization. 'SLI' would then be something of a misnomer [p. 265].

> On this line of reasoning, the data above, together with the general pattern of an impairment primarily of inflectional morphology in SLI, suggest that it may not be language as such, as a cognitive-computational system, which is impaired in SLI, but rather its mapping to the sensory-motor interface: its externalization in a morpho-phonological surface. Again, the cognitive tasks in the above study do not involve 'language', only if we exclude from the domain of language its abstract computational principles [p. 266].

At the same time, Hinzen and Sheehan do not pay close attention to the role language may play in cognition (and thought), discarding the relevance of notions like working memory or executive functions "There is also strong evidence, ..., that children with SLI have problems with perception, with working memory, and with executive functions. This does not suggest a deficit specific to language" [p. 266].

The ambiguous stance Hinzen and Sheehan adopt towards externalization is perhaps clearest when one juxtaposes two passages taken from two consecutive pages:

> Externalization, though a crucial part of language, as we will contend in the next chapter, may be impaired when "language" is not (or less so) [p. 266]; the intrusion of externalized, public language into the mind is a seismic shift, remoulding much of our mental life and thought, consistent with the present perspective [p. 267].

Or consider this passage [p. 268]:

> It also underlines that this was not a human being using language in the privacy of his own mind, with externalization being an afterthought that didn't change what was going on inside: a linguistic being, which Ildefonso was clearly not, requires the use of language as a shared communicative medium.

PUG repeatedly delivers passages such as:

Patients performed well on this task, clearly suggesting that the prob-
lem of severe aphasia is not one of communication per se, but with lan-
guage. ...What Willems et al.'s experiment does not address is the
question of whether agrammatical aphasics have communicative inten-
tions whose content requires a sentence to express. ... In the former
case, the problem that patients with severe aphasia face is not one of
language but merely one of externalization: it's a communication prob-
lem that their linguistic minds cannot solve any more [p. 269].

The problem is, as Hinzen and Sheehan acknowledge, "We don't
know how to decide between these options, even in principle. Since
thoughts in severe aphasia cannot be externalized in language, and
some thoughts cannot be expressed in anything other than a sentence,
we simply don't know how to find out whether there are such thoughts
in severe aphasia." But I doubt that the problem is confined to aphasia.
Virtually in all cases of disorder discussed, I found myself asking the
same question (is this a problem of language or merely one of exter-
nalization?), and reached the same conclusion "I don't know how to
find out", which convinced me that PUG's approach is ultimately un-
testable/unfalsifiable.

On several occasions, Hinzen and Sheehan claim, when they
seem to go against received wisdom in clinical linguistics which takes
thought/cognition to be affected, but syntax as unimpaired, that "this
view circularly depends on characterizing syntax so as for it not to af-
fect thought or cognition" [p. 280]. But the same criticism could be
leveled at them: where they see thought affected, they claim that
grammar breaks down too, even if to linguists the grammatical profile
of these patients is within the normal range.

It seems pointless to me to examine closely the treatment of
schizophrenia as a thought- (and therefore grammar-) disorder. PUG's
position is that "Patients with aphasia have normal thoughts and ex-
press them with difficulty; those with schizophrenia have unusual
thoughts (or disorganized discourse plans) and express them with
comparative ease. Where the linguistic genotype is normal, in short, as
in aphasia, thoughts are normal; where it is severely shaken, as it may
be in schizophrenia, thought disintegrates" [p. 284].

How can one characterize the linguistic genotype as normal in
the absence of a clear statement of what the linguistic genotype is?
And if we don't know how to find out if aphasia is a problem of
grammar or externalization, how can one find out if schizophrenia is a

thought disorder or thought-disordered speech? PUG does not (cannot?) say. But even if Hinzen and Sheehan insist on a thought disorder diagnostic, they should ask themselves why schizophrenics never disorganize grammar so much as to choose different referential coordinates, and why no disruption of the "linguistic genotype" (whatever that is) apparently leads to, say, patients 'referring' at non-phasal junctures.

VI. NOVELTY

The final issue I'd like to address in this review concerns the nature of the semantic novelty that grammar gave rise to according to PUG. Grammar, we are told, gave us "a specific mode of thought, which gives rise to a unique form of knowledge that is inherently linguistic in character" [p. 34]. Indeed, it is claimed that grammatical relations "made knowledge possible" [p. 9]. On numerous occasions in the book, Hinzen and Sheehan contrast their view with that of Chomsky, which they claim boils down to reducing "the evolution of language, in its grammatical aspects, to the emergence of the operation Merge [Berwick and Chomsky (2011)]. This Merge-based view leaves us with no clear clues on the nature of language or what makes it specific, given the genericity of Merge/recursion. The stress on domain-generality, minimality, and genericity, and on the pre-linguistic richness of the so-called 'Conceptual-Intentional' systems, thus comes with the danger of leaving us without a grasp of what the effects of grammar on cognition actually are. Does Merge still capture the essence of grammar? Can it explain a reformatting of mind or the emergence of a new mode of thought and a species?" [p. 251].

For Hinzen and Sheehan, the answer is clearly no. We are repeatedly told that "evidence from non-linguistic beings for such capacities is precisely absent" [p. 246], that whatever 'referential abilities' animals may have, it cannot be the same as what humans have, since "reference is therefore not a base notion of semantics: for it arises only with grammar" [p. 37]. "Reference in non-linguistic animals takes a completely different form (and may well be explainable causally). Intentional reference, in the human sense, involves language, and it needs to be explained linguistically, not semantically" [p. 42].

The problem with this view, as Chomsky has noted on countless occasions, is that grammatical constructions or words don't refer.

People use them to refer, but grammar as such does not. So, the explanation for human-specific reference can't reduce to grammatical factors. Hinzen and Sheehan note [p. 46] that "What is missing in the mouse's thought is, we claim in the rest of this book, a formal ontology, by which we mean a system of formal distinctions by which objects of reference are classified as objects and events, propositions and facts, properties or states." But which mechanism ensured the right classification? We can, of course, stipulate this as a "lexical" fact, but this is no explanation. And why, if grammar is so discontinuous from the rest of primate cognition, does it resort to classes like object, event, etc., as opposed to other conceivable notions (smells, colors, etc.)? Is it an accident that these notions, which grammar exploits (and, possibly, reformats), are found in other species [see Hurford (2007)]?

I don't doubt that the emergence of grammar was transformative. But saying that it creates reference is quite distinct from assuring that "the grammar narrowly constrains the ways in which words can be used to refer" [p. 117], especially once we take into account that grammar "mak[es] available a small number of discrete options in which this can happen, organized in the form of a hierarchy, ranging from purely predicative nominals to quantificational, to referential, to deictic, and finally to personal ones". (Nowhere do Hinzen and Sheehan show how these referential options are made available by the grammar. I think this is a weakness of the book, as I cannot imagine how the grammatical mechanism they allude to – phases – can give rise to as many as the 5 options just quoted.)

It seems to me that Hinzen and Sheehan, in at least two passages in the book, are aware of the fact that there is a less radical scenario for the transformative nature of grammar, one that would allow for greater continuity with non-linguistic species. As they note, the key novelty need not be the regulation of reference, or the grammaticalization of truth, but rather, lexicalization, the process by which the brain "items that can be freely called up, partially independent of perception" [p. 38]. "As 'concepts' are formed from perceptual features of the environment, and concepts become lexemes, meaning gets encapsulated in units that live a life independent of environmental stimulation. It thus has to be related back to the environment, so as to be useful in directing one's thought to it. Concepts/words thus have to be made referential again or be reconnected to the environment, which is not the case for perceptual features" [p. 173]. The novelty of reference may be

quite secondary, it may be the application of an ancient mechanism applied to novel mental units detached from their perceptual inputs. It need not be a radically new, sui generis mechanism: "The process of lexicalization de-couples the percepts that are selected from their respective visual stimuli, giving us new and more abstract entities, lexical items, which are stimulus-free and independently manipulable, enabling creative thought and reference. For this reason, we may describe this process as one of 'de-indexicalization'. Any such process will require another process of re-indexicalization: freedom from experience is bought at the cost of having to re- establish a link with experience. It is what we are trying much of our waking lives to achieve (when we are not day-dreaming): saying something true rather than false, seeking evidence, exercising doubt. Where concepts are de-indexicalized, a mechanism is needed to relate them back to the world on occasions of activating them: a system converting concepts into referential expressions. In this reference-system, reference to the world will be a creative (intentional) act subject to conscious control — and of error as well. We identify this system with grammar." The dramatic change may well have been the "deindexicalization" (as I argue in Boeckx (2011b,c)], with the "reindexicalization" (as its name suggests) a case of evolutionary tinkering (entailing evolutionary continuity).

VII. CONCLUSION

To conclude, let me repeat that PUG is a very ambitious book. It offers a deflationist approach to thought that puts grammar into the spotlight. But as often happens with ambitious projects, they end up biting off more than they can chew. In the case of PUG, we are left with too many unclarities[2]: what is the grammar? what is the linguistic genotype? is externalization ancillary, as the treatment of cross-linguistic variation suggests, or is it a significant part of grammar, as other parts of the book argue? And is the vision all that un-Cartesian? As a result, one is left with the impression that despite the rhetoric some of the central claims of the book are not all that different from "Cartesian" proposals, and where they do seem to differ, the unclarities discussed in this review make the model untestable. Philosophical investigations into the nature of Universal Grammar and our species are welcome, but they must be solidly grounded in biology. As Charles Darwin put it [(1838),

Notebook M], "He who understands baboon would do more towards metaphysics than Locke."

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NOTES

[1] Having said, this, I do believe that PUG should have gone through more careful editing before publication. While reading, I came across several linguistic examples attributed to authors that in fact do not discuss the relevant examples in the works cited in PUG. I also came across several contradictory passages such as the following [on p. 22].

In the main text, we are told that "Language is not the vehicle of meaning or the conveyor-belt of thought. ...Wittgenstein will later formulate very similar views."

But in the footnote that aims at illustrating Wittgenstein's view, we read just the opposite of what the main text leads us to expect: "Cf. When I think in language, there aren't "meanings" going through my mind in addition to the verbal expressions: the language is itself the vehicle of thought. (Wittgenstein)"

[2] An anonymous reviewer asks if writings by Hinzen subsequent to PUG could clarify these issues. Unfortunately, I have not been able to find answers to these questions in these writings.

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R<small>ESUMEN</small>

Esta nota ofrece una revisión crítica del libro de Hinzen y Sheehan (2013), *The Philosophy of Universal Grammar*. El libro trata de presentar las promesas explicativas de lo que se ha denominado enfoque "no-cartesiano". Argumento que tales promesas no se han cumplido. El libro, y también el armazón tomado en su totalidad, contienen serias lagunas que le impiden alcanzar sus objetivos explicativos. Los temas que se discuten aquí son la variación, la universalidad, las mentes animales, la salud mental, la novedad evolucionista, la especiación y la naturaleza de la empresa biolingüística.

P<small>LABRAS CLAVE</small>: *lingüística cartesiana, lingüística no cartesiana, biolingüística, lingüística clínica, mente*.

A<small>BSTRACT</small>

This note offers a critical review of Hinzen and Sheehan's (2013) book *The Philosophy of Universal Grammar*. The book aims at showing the explanatory promises of what is dubbed the "un-cartesian" approach. I argue that these promises are not fulfilled. The book, and indeed the framework as a whole, contains serious lacunae that prevents it from reaching its explanatory targets. The themes discussed here are variation, universality, animal minds, mental health, evolutionary novelty, speciation, and the nature of the biolinguistic enterprise.

K<small>EYWORDS</small>: *Cartesian Linguistics, Uncartesian Linguistics, Biolinguistics, Clinical Linguistics, Mind*.