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UG or not UG: Where is Recursion?

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Abstract: The operation Merge, applying to two syntactic objects to produce a third and instantiating the property of recursion, has been a fundamental and largely uncontroversial feature in the development of the Minimalist Programme. In early formulations, such as Chomsky (1995a, b), Merge is cited as a feature of the human language faculty that illustrates virtual conceptual necessity, and it is an examination of this characterisation that stimulates the concerns addressed here, where we argue that neither of the familiar routes (satisfaction of interface conditions or computational economy) provides a justification for the conceptually necessary status of Merge. A third route, *via* considerations of 'languages as such,' a notion that includes human and artificial languages, may provide the required justification, but, as Chomsky (1980) urges, the study of 'languages as such' is unlikely to yield *empirically* interesting results. Specifically, this route to justification will not locate Merge in UG if the content of UG is an empirical matter. This conclusion is damaging to the view (Hauser *et al.*, 2002) that the emergence of recursion (and Merge) is the single development crucial to the evolution of language, an empirical proposal, albeit in a different discourse, that firmly places Merge in UG.

Keywords: *Recursion, Merge, Minimalism, UG, Conceptual Necessity, Evolution.*

Resumen: La operación Merge, aplicada a dos objetos sintácticos para producir un tercero, y ejemplificando así la propiedad de la recursividad, ha venido siendo un rasgo fundamental y ampliamente aceptado en el desarrollo del Programa Minimalista. En sus primeras formulaciones (Chomsky 1995a,b), Merge es propuesto como un rasgo de la facultad humana del lenguaje que ilustra una necesidad virtual humana. La problemática que aquí se aborda es precisamente un examen de esta caracterización. Se defiende aquí que ninguna de las vías de justificación habitualmente propuestas (la satisfacción de las condiciones de interfaz o la economía computacional) prueba el estatus de necesidad conceptual de Merge. Una tercera vía que considera 'las lenguas como tales,' propuesta que incluye tanto a lenguas humanas como a las artificiales, podría ofrecer la

justificación adecuada, pero, tal y como insta Chomsky (1980), el estudio de las 'lenguas como tales' probablemente no resultaría en conclusiones *empíricamente* interesantes. En concreto, esta vía de justificación no localizaría a Merge como parte de la Gramática Universal si el contenido de esta es una cuestión empírica. Esta conclusión daña la idea (Hauser *et al.*, 2002) de que la aparición de la recursividad (y de Merge) es la principal novedad que propició la evolución del lenguaje, una propuesta empírica, si bien es cierto que en un contexto diferente, que sitúa firmemente a Merge dentro de la Gramática Universal.

Palabras clave: Recursividad, *Merge*, *Minimalismo*, *UG*, *Necesidad Conceptual*, *Evolución.*

Resumo: A operação Compor, aplicada a dois objetos sintáticos para produzir um terceiro e instanciar a propriedade de recursividade, tem sido uma característica fundamental e indiscutível ao longo do desenvolvimento do Programa Minimalista. Nas primeiras formulações, como Chomsky (1995a, b), Compor é descrito como uma propriedade da faculdade da linguagem humana que ilustra a necessidade conceptual virtual. É a análise desta caracterização que motiva este artigo, onde defendemos que nem a satisfação das condições da interface nem a economia computacional conseguem justificar a necessidade conceptual do estatuto de Compor. Um terceiro aspeto, *via* entendimento das 'linguagens como tal', uma noção que inclui a linguagem humana e as linguagens artificiais, pode fornecer a justificação pretendida. No entanto, como Chomsky (1980) reforça, o estudo das 'linguagens como tal' poderá não surtir resultados *empiricamente* interessantes. Mais especificamente, esta proposta de justificação não localiza Compor na Gramática Universal (UG) se o conteúdo da Gramática Universal (UG) for de natureza empírica. Esta conclusão não suporta a perspetiva (Hauser et *al.*, 2002) de que a emergência da recursividade (e Compor) é o único desenvolvimento crucial para a evolução da linguagem, uma proposta empírica, embora num discurso diferente, que coloca indiscutivelmente Compor na UG.

Palavras-chave: *Recursividade, Compor, Minimalismo, Gramática Universal (UG), Necessidade Conceptual, Evolução.*

1. Introduction*

It is apparent in Chomsky (1995a, 2000a and many other places) that the core recursive operation of the computational system of human language (CHL), always regarded in these sources as binary Merge, enjoys a privileged role. For instance, in Chomsky (1995a, 378) he says:[1] 'Something like Merge is

*We are grateful to an anonymous Iberia reviewer for comments on an earlier version of the paper.

[1] Throughout this discussion, we shall not seek to systematically distinguish recursion from (binary) Merge, following whatever terminology appears in the passages to which we give attention and on occasion resorting to the use of

inescapable in any language-like system …'; and again (2000a: 101): 'One [operation] is indispensable in some form for any language-like system: the operation *Merge* …'. In these two passages, we see reference to 'language-like' systems, a matter that will take on additional significance as our discussion proceeds. However, we should also note that Chomsky himself, along with many others, is not averse to construing the necessity of Merge more restrictively as a feature of *human* languages. For instance, we find in Chomsky (1995a: 226) the claim that '… the operations Select and Merge, or some close counterparts, are necessary components of any theory of *natural* language.' (italics added). And Smith (2004: 88-89), having observed that Merge is a subpart of CHL, 'the Computational system for *Human Language*' (italics added), goes on to state that '[Merge's] conceptual necessity does not obtain so obviously for Agree.'

The presence of something like Merge, it is maintained, is responsible for the so-called *discrete infinity* of language, which is a property of linguistic expressions generated by the potentially *infinite* application of Merge (what Chomsky often refers to as *unbounded* Merge) to a finite set of *discrete* lexical items or syntactic objects.[2] From Chomsky's perspective, it is this property that

'recursion/Merge' to signal indifference. Clearly, recursion is a *system* property, as well as an *operation* property, i.e. a system can exhibit recursion *via* a sequence of operations none of which is individually recursive: binary Merge, as standardly understood, is a recursive operation, and any system including it exhibits recursion. Additionally, recursion as an operation property is *general*, with binary Merge being just one instantiation of this property. Also, we shall set aside questions that arise in the context of attempts to justify the binarity of Merge. Clearly, there are two questions that the standard minimalist methodology urges: (i) why does the Language Faculty include any recursive operations at all? (ii) why is one (perhaps the only one) of these binary Merge? The focus in this paper is entirely on issues arising in connection with (i).

[2] Discrete infinity, according to Chomsky, is also the property that differentiates human languages from animal communicative systems (cf. Hauser *et al*. 2002: 1576), an issue to which we shall return in Section 6. Pullum and Scholz (2010) argue that while it is commonplace for linguists working within the Chomskian framework to regard this property of 'discrete infinity' as an entirely uncontroversial attribute of human languages, no sound argument to this conclusion has ever been provided. The seductiveness of the ascription of discrete infinity to natural languages, they suggest, has its origins in what were legitimate idealisations in theory construction in the early days of generative grammar, idealisations that led naturally enough to the inclusion of recursive operations in the theories being put forward at the time. The more recently developed constraint-satisfaction accounts favoured by Pullum and Scholz are non-committal on the issue of discrete infinity and consequently on the necessity of operations such as Merge. This perspective will also re-emerge in the final section of this paper.

makes Merge indispensable for any language-like system, and the question of how this indispensability should be interpreted will structure much of the discussion of this paper. For present purposes, suffice it to say that, insofar as Merge embodies the generative capacity of the Language Faculty, recognition of the special status of some such recursive operation in human language is readily apparent in Chomsky's pre-minimalist views on the nature of this cognitive system. Consider, for instance, the following passage from Chomsky (1968), a commentary on the definition of human intelligence due to the Spanish physician Juan Huarte, in which he observes (p. 15) 'striking similarities between the seventeenth-century climate of opinion and that of contemporary cognitive psychology and linguistics.'

> Huarte came to wonder at the fact that the word for 'intelligence,' *ingenio*, seems to have the same Latin root as various words meaning 'engender' or 'generate.' This, he argued, gives a clue to the nature of mind. Thus, 'One may discern two generative powers in man, one common with the beasts and the plants, and the other participating of spiritual substance. Wit (Ingenio) is a generative power. The understanding is a generative faculty.' Huarte's etymology is actually not very good; the insight, however, is quite substantial. (*ibid*.: 9)

In the same work, Chomsky (*ibid*.: 10-11) sees an observation made by Descartes concerning the distinctive feature of human language as supportive of this same general idea:

> In fact, as Descartes himself quite correctly observed, language is a species-specific possession, and even at low levels of intelligence, at pathological levels, we find a command of language that is totally unattainable by an ape that may, in other respects, surpass a human imbecile in problem-solving ability and other adaptive behavior… There is a basic element lacking in animals, Descartes argued, … namely Huarte's second type of wit, the generative ability that is revealed in the normal human use of language as a free instrument of thought.

Thus, Chomsky's emphasis on the importance of the generative perspective is not new, and it is not misleading to view this early emphasis on the privileged role of the recursive property of language as later culminating in what Pinker and Jackendoff (2005) have called the 'recursion-only hypothesis,' that is, the hypothesis that recursion is the only uniquely linguistic and uniquely human property of the Language Faculty, which was first advanced in Hauser, Chomsky, and Fitch (2002).

2. The conceptual necessity of Merge

We have observed that, for Chomsky, Merge is a necessary (i.e. indispensable) property of any language-like system, but what kind of *necessity*

is this? Chomsky (1995b: 396) offers an answer to this question when he says: '[Merge] is necessary *on conceptual grounds alone*: an operation that forms larger units out of those already constructed …' (italics added). Here, then, we have 'conceptual necessity' ascribed to Merge, and it is instructive to set this ascription alongside the notorious passage that introduces this paper (*ibid*.: 385-6):

> … what conditions on the human language faculty are imposed by considerations of virtual conceptual necessity? … To what extent is the language faculty determined by these conditions, that is, how much special structure does it have *beyond them*? The first question in turn has two aspects: what conditions are imposed on the language faculty by virtue of (A) its place within the array of cognitive systems of the mind/brain, and (B) general considerations of simplicity, elegance and economy that have some independent plausibility.' (italics added)

Two observations concerning this passage are in order.[3] First, what it seems to suggest is that the ascription of conceptual necessity can arise from either of two ways of viewing language: one as a cognitive system embedded in other such systems, and another as an object to which 'considerations of simplicity, elegance and economy' apply. More specifically, if the Language Faculty is regarded as a system that generates linguistic expressions, and if the information encapsulated in these expressions is available to speech and thought systems (or, to use the conventional terminology, the Articulatory-Perceptual system (A-P) and the conceptual-intentional system (C-I), respectively), then it is a conceptual necessity that these two systems have access to the information provided by the Language Faculty; this latter must satisfy *interface conditions*. Features of the Language Faculty that enable the satisfaction of these conditions are then viewed as themselves conceptually necessary.[4] On the other hand, if human language is viewed as a natural object, and if the natural world *in toto* is governed by simple and elegant laws, then those laws that govern human language and display the requisite simplicity or

[3] Here we set aside any misgivings about the modifier 'virtual' and we shall not use this modifier from now on. For particularly acerbic remarks on the rhetorical force of this hedge, see Postal (2003: 599). To our knowledge, there has been no attempt to assign it a reputable purpose.

[4] Elsewhere, Chomsky (2002: 108) formulates this in terms of an argument from 'usability': 'The language faculty has to interact with those systems, otherwise it's not usable at all …, given that the language is essentially an information system, the information it stores must be accessible to [sensorimotor and thought] systems.' Thus, an 'inert' Language Faculty, generating its expressions to no purpose, is regarded as a conceptual impossibility. Clearly, it is not a *logical* impossibility.

elegance do so as a matter of conceptual necessity.[5] It is a conceptual impossibility for language to be simultaneously part of the natural world and to operate outside the principles that govern that world. Secondly, the passage also seems to propose a contrast between what is *special* to language as opposed to what follows from these considerations regarding conceptual necessity. As we shall see later (Section 6), this contrast assumes a different form in the context of Chomsky's (2005) 'Three-Factors' framework, one that opens the door for what we shall suggest is a problematic implication for the ontological status of Merge.

We have two routes to conceptual necessity, then: one by reference to interface conditions and the other adverting to optimal computation, this latter expression now being used as a cover term for whatever simplicity, elegance and their kin are intended to denote. Interface conditions are imposed by the external systems of speech and thought, and optimal computation owes its credentials to the supposition that the operation of the Language Faculty is subject to whatever general principles govern the natural world.[6] Before we proceed to examine these two routes in more detail and the extent to which they may be applicable to the case of Merge, we should observe that together they identify the two core aspects of the so-called Strong Minimalist Thesis (SMT), which is introduced in Chomsky (2001: 1) in the following terms: 'The strongest minimalist thesis would hold that language is an optimal solution to [legibility] conditions.' There has been some evolution from earlier terminology to this formulation, with 'legibility conditions' replacing reference to the Language Faculty's 'place within the array of cognitive systems of the mind/brain,' and 'optimal solution' appearing in place of 'general considerations of simplicity,

[5] Given Chomsky's 'naturalistic' approach to language, we link simplicity considerations with the notion of 'natural object' in this way despite the fact that only the former is explicitly mentioned in the passage under discussion. See Chomsky (1995c) for extensive discussion of language as a natural object. Of course, there is much here that one could, and perhaps should, pause on. For instance, the notion of 'law' as it is used in the natural sciences does not figure much in linguistic discourse (although, see Pesetsky and Torrego 2001 for use of the word but no discussion of its appropriateness); and the concepts of 'simplicity' and 'elegance,' are hardly innocent, as extensive discussions in a variety of forums indicate (in general science, see, for example, Sober 2001, and, in linguistics, among others, Fukui 1996, Uriagereka 1998, Freidin and Vergnaud 2001, and Epstein and Seely 2002).

[6] Whether it is straightforwardly appropriate to view optimal computation as the result of the operation of physical laws that themselves exhibit simplicity, generality, etc. is far from clear. For some initial discussion of the uncertainties here, see Al-Mutairi (2011: 244ff).

elegance and economy that have some independent plausibility.'[7] More importantly, this formulation of the SMT invites us to think carefully about the ontological status of Merge, the issue to which we now turn.

3. Merge and the two routes to conceptual necessity

What are our options with regard to Merge and the two aspects of the SMT (equivalently, the two routes for justifying an ascription of conceptual necessity)? Starting with optimal computation, we can immediately see that it makes little or no sense to try to justify the presence of Merge in the operation of the Language Faculty with respect to any aspect of this notion. The methodological emphasis on simplicity, etc. in the cited passage from Chomsky (1995b: 385-6) may provide some purchase on why the recursive operation in question should be *binary* Merge, a view that has been attractive to many, most recently Krivochen (2011), and some have argued that binarity can be justified by reference to principles that play some role at least in the description of the natural world, viz. Fibonacci sequences (Carnie and Medeiros, 2005), but the binarity of Merge is not what is at issue here; rather we are concerned with question (i) from fn. 1 above, and while it may be the case that the necessity of recursion can be ascribed *via* reference to the particulars of the computations the Language Faculty performs, this does not amount to recursion itself bestowing *optimality* on these computations. Without recursion, these computations may be demonstrably *inadequate*, but we take it that optimality is stronger than mere adequacy.[8]

Turning to legibility conditions, the issue looks more promising. Focusing on the C-I interface, we may be tempted by the suggestion that its expressive power is unrestricted, in the sense that whatever atoms function in this domain can be combined with each other indefinitely, so producing an instantiation of the property of discrete infinity in the C-I system. Chomsky (2000a: 94) notes this perspective, without dismissing it as implausible or unhelpful, when, in speculating about the emergence of the Language Faculty, he says:

[7] Indeed, there is no explicit reference to the SMT in Chomsky (1995a, b). However, it is hardly controversial to suggest that a version of the SMT is implicit in the passage from Chomsky (1995b: 385-386) cited above. Specifically, if we propose 'none' as the answer to the question in this passage regarding special structure, this seems to us to be equivalent to the formulation of the SMT introduced here.

[8] More searchingly, if we were to be convinced by Pullum and Scholz's agnosticism about what they (2010: 117) refer to as the No Maximal Length claim, even the necessity of recursion in dealing with the range of linguistic structures can be questioned.

> Imagine some primate with the human mental architecture and sensorimotor apparatus in place, but no language organ. It had our modes of perceptual organization, our propositional attitudes (beliefs, desires, hopes, fears, …) insofar as these are not mediated by language, perhaps a "language of thought" in Jerry Fodor's sense, but no way to express its thoughts by means of linguistic expressions, so that they remain largely inaccessible to it, and to others.

Now, the Language of Thought (LOT), as understood by Fodor, displays some of the crucial properties of natural languages (see, for instance, the Appendix to Fodor 1987).[9] In particular, its expressive power requires a recursive syntax. So, if the conceptual necessity exhibited by some (or all) aspects of the Language Faculty is partially driven by the need to satisfy interface requirements appropriately, we can immediately see in the LOT an interface-driven motivation for the presence of recursion/Merge in language.[10] Despite this, Chomsky has never, to our knowledge, explicitly proposed this sort of justification for recursion/Merge, and we must now consider why this is so.[11]

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[9] A relevantly explicit statement is (*ibid*.: 147—148):

> The classical argument that mental states are complex adverts to the productivity of the attitudes. *There is a (potentially) infinite set of – for example belief-state types*, each with its distinctive intentional object and its distinctive causal role. This is immediately explicable on the assumption that belief states have combinatorial structure …. The LOT story is, of course, a paradigm of this sort of explanation, since it takes *believing to involve a relation to a syntactically structured object* …' (italics added)

[10] A similar emphasis, using quite different terminology, can be identified in Chomsky (2004: 105) when he introduces IC (not to be confused with C-I!) as an "interface condition" and then remarks (*ibid*.: 106):

> The language L generates a set of derivations. The last line of each derivation D is a pair ⟨PHON, SEM⟩, where PHON is accessed by [the sensorimotor system] and SEM by C-I. D *converges* if PHON and SEM each satisfy IC; otherwise it *crashes* at one or the other interface. IC must be strong enough to allow sufficient diversity of "legible" expressions at the SEM interface. Exactly how this requirement should be formulated is not obvious. At least infinite legibility is presumably required …

This formulation appears to require some source for the 'sufficient diversity' referred to and this, along with the allusion to 'infinite legibility', is consistent with the C-I system displaying discrete infinity and requiring this property to be mirrored in the Language Faculty. Interestingly, we are not aware of any references to IC in subsequent papers by Chomsky.

[11] It is of some interest, particularly in the light of the previous footnote, that Chomsky (2010: 55, fn25) expresses a rather different view on the value of assuming a

If Merge were conceptually necessary by virtue of it being analysable in terms of either of the two routes under discussion here, it would follow that it does *not* qualify as contributing to any 'special structure' that might be associated with the Language Faculty (recall the contrast noted above between what is special to language as opposed to what follows from general considerations of conceptual necessity). In fact, if read in the context of the passage cited from Chomsky (1995b: 385-386), the formulation of the SMT above appears to require that, not only Merge, but no other language property qualifies as contributing to whatever special structure we might attribute to the Language Faculty; in effect, the SMT formulated in this way, if correct, entails that language has no special structure beyond the domain of conceptual necessity.

Now, this suggestion contrasts sharply with Chomsky's firm and long-standing belief that, if language acquisition is not to be regarded as miraculous, there must be something special about language.[12] Moreover, and of direct concern to this paper, it seems to be in direct conflict with Chomsky's recent support for the recursion-only hypothesis introduced at the end of Section 1 and to which we shall return in Section 6.

On the basis of the above considerations, the question arises as to whether Merge can be regarded as *both* instantiating a conceptual necessity *and*

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role for the LOT in accounting for the emergence of language in the species to that cited in the above passage:

> Note that postulation of an independent or prior "language of thought" LOT raises all the problems of the evolution of language, but with the extra difficulty that we have almost no idea what LOT would be, independently of linguistic evidence.

Adoption of this view severs any explanatory link between the C-I interface and recursion in language by maintaining that, abstracting away from the effects of language, i.e. causation from language to thought, there is no reason to suppose that the C-I interface brings any demands that would require the emergence of recursion in the Language Faculty. It is also noteworthy that this paper was first circulated in 2005.

[12] Observe that this recognition of there being something special immediately gives rise to the implication that the SMT (as formulated above) is *untenable a priori* and, therefore, cannot be regarded as embodying an empirical thesis; i.e., if we accept the fact that there must be something special about language, then the SMT is, *ipso facto*, false and no empirical research is required to find out whether all language properties derive from general considerations of conceptual necessity. Chomsky himself (2001, 1) concedes that 'SMT cannot be seriously entertained,' while simultaneously suggesting that 'in nontrivial respects some such thesis holds.' Below (p. 53), we shall meet an alternative formulation of what continues to be confusingly referred to as the SMT that does not embody this failing.

contributing to the special structure of the Language Faculty? Perhaps there is a *third* way of viewing conceptual necessity, one that differs from the necessity associated with legibility conditions and optimal computation. In order to pursue this matter, we will first review a sample of remarks on 'conceptual necessity' to see whether other scholars' discussion of this notion provides any useful perspectives.

4. Views on the nature of conceptual necessity

Based on our interpretation of the key passage from Chomsky (1995b), we have identified two routes *via* which conceptual necessity may be ascribed to properties of the Language Faculty: that of satisfying legibility (or interface) conditions and that of instantiating optimal computation. We have also seen that neither of these two routes yields a justification for the presence of Merge in human language. It is perhaps indicative of the obscurity and confusion that surrounds the notion of conceptual necessity that, within the minimalist literature, scholars vary widely in its interpretation

Grohmann, referring to Bare Output Conditions, terminologically the antecedents of interface conditions, appears to identify the locus of conceptual necessity exclusively with the satisfaction of these latter. He says (2003: 10):

> What '(virtual) conceptual necessity' dictates is that *all* conditions on the computation follow from Bare Output Conditions. These are conditions that relate directly to the conceptual-intentional and articulatory-perceptual interfaces (italics added).

Here, there appears to be no place for optimal computation.

In direct contrast, Langendoen (2003: 307), a critic of the minimalist approach, while seeing a role for the satisfaction of interface conditions, restricts the ascription of conceptual necessity entirely to factors that instantiate optimal computation, or, more specifically, general considerations of simplicity, elegance and economy:

> The minimalist program is an effort to discover the degree to which the human language faculty is determined by sensorimotor and conceptual-intentional 'interface conditions' together with considerations of 'virtual conceptual necessity,' in particular by 'general considerations of simplicity, elegance, and economy.'

Here, the use of 'together with' fairly explicitly excludes conceptual necessity ascription from mechanisms involved in the satisfaction of interface conditions.

Others introduce conceptual necessity in terms that refer neither to optimal computation nor to interface conditions. Thus, Hornstein *et al*. (2005: 6)

define it in terms of what they regard as 'big facts,' that is, 'those facts about language that any theory worthy of consideration must address.' Relevant to the major theme of our discussion here, one such fact, the authors argue, is that sentences are composed of smaller units like words and phrases, a fact that is accommodated by the Language Faculty containing the conceptually necessary operation Merge. They write: 'Merge is conceptually necessary given the obvious fact that sentences are composed of words and phrases.' (*ibid.*: 207). Here, then, we appear to have a third route to conceptual necessity, *via* an 'obvious fact', however that is to be understood.[13]

Taking a somewhat different stance, Smith (2004) formulates a contrast between what is 'conceptually necessary' and what is 'empirically unavoidable,' defining the former as that which it 'is impossible to do without.' As an example of this, he cites, *inter alia*, the existence of a lexicon and the two interface levels, PF and LF (*ibid.*: 84). Confusingly, in his foreword to Chomsky (2000b), Smith says:

> … any deviations from conceptual necessity manifest by the language faculty (that is, the I-language) are motivated by conditions imposed from the outside. Chomsky calls these 'legibility conditions.' (Smith, 2000: xii)

It would appear, then, that Smith sees conceptual necessity as accruing in the context of something like Hornstein *et al.*'s 'big facts', with *empirical* necessity, ascribable, we suppose, to that which is 'empirically unavoidable,' taking over in the domain of legibility conditions, which are explicitly viewed as involving 'deviations from conceptual necessity.' Optimal computation has no role in this characterisation.

In sharp contrast to all of the above, Boeckx (2006: 75) appears to understand conceptual necessity in terms of a contingent state of inquiry:

> Virtual conceptual necessity refers to what appears to be necessary at the present stage of understanding (everything we now know is subject to change; this is what makes minimalism an empirical science: all its theoretical constructs are subject to empirical falsification).

This temporal interpretation may strike some as implausible, making it difficult to distinguish conceptual necessity, surely intended to imbue propositions with something approaching permanence, from contingent belief. It would appear that, for Boeckx, the existence of a phrase-structure component

[13] Note once more that in order to justify the presence of *recursive* Merge yielding the discrete infinity property, it is necessary to assume a variant of the No Maximal Length Claim discussed by Pullum and Scholz (2010). Hornstein *et al*. make this assumption, saying that being 'recursive' is another 'big fact' about language.

from the early period of generative grammar would have exhibited conceptual necessity during that period, only to shed this necessity a few years later![14] That Boeckx himself may not be confident with this interpretation is indicated earlier in the same source when he asks (*op. cit.*: 4): 'How much (sic) of these linguistic principles follow from the most basic assumptions/axioms *everyone has to make when they begin to investigate language* (what Chomsky has called virtual conceptual necessity?' (italics added). The universal quantifier here leaves no room for merely following the fashion of the times, we might feel.

Finally, for an example where rhetoric appears to outdo content, we note that in his foreword to Uriagereka (1998), Piattelli-Palmarini (p. xxxiv) asserts that the minimalist programme 'vastly expands the bounds of 'virtual conceptual necessity' (i.e., of what about the basic design of human languages must be as it is because it could not possibly, conceivably, be otherwise).' Here, we appear to have little more than redundant iteration of adverbs taking the place of reference to any aspect of the structure or function of the Language Faculty.

What is perhaps most striking about the sample of cases we have observed here is that none of these articulations of what is understood by conceptual necessity, if we are to regard them as such, seems to be in tune with what Chomsky (1995b) himself appears to suggest. There, we have two routes to the ascription of conceptual necessity: interface conditions and optimal computational. Grohmann omits any reference to the latter, Langendoen fails to associate the former with any species of necessity, and Hornstein *et al.* refer to neither. Smith invokes legibility conditions, but sees their satisfaction as linked to empirical necessity, with conceptual necessity being reserved for something like Hornstein *et al*'s 'big facts.' Furthermore, none of these authors gives any hint that they are seeking to describe something other than what Chomsky intended.

We conclude, then, that it is difficult to see anything useful for our purposes emerging from these various programmatic remarks. Thus, the question raised at the end of the previous section persists: is there any way in which we can see recursion/Merge as conceptually necessary to the Language

[14] Despite this lukewarm assessment, we shall argue in Section 6 that that to which conceptual necessity has been ascribed must, in principle, be revisable. The *Iberia* referee suggests that this characterisation by Boeckx is entirely uncontroversial and that it is a characteristic of science generally that what were once regarded as fundamental assumptions are later modified or even rejected. Of course, the referee is correct, but to our knowledge scientists in other disciplines have not seen it as of value to ascribe conceptual necessity, an ascription that may be seen as a deterrent to empirical enquiry, to their fundamental assumptions.

Faculty without prejudicing its status as somehow special, a status that is demanded by the recursion-only hypothesis? Conceivably, Hornstein *et al*'s explicit reliance on 'big facts' and Smith's implicit use of something similar provides the third route to which we referred earlier, and we shall now see that there is probably something in this, although reference to such 'big facts' is not particularly helpful in this context.

5. Merge and the third route to conceptual necessity

In Section 1, we noted Chomsky's view that discrete infinity is the property of natural languages that makes Merge indispensable and it is now time to specify how this indispensability should be construed.

We begin by introducing the notion of *language as such*. Consider the following passage from Chomsky (1980: 28-29), in which we find an emphasis on a distinction between two usages of 'universal grammar.' Having offered a familiar characterisation in terms of human biological properties, he goes on:

> It is important to distinguish this usage from a different one, which takes 'universal grammar' to be a characterization not of human language but of 'language as such.' In this sense, universal grammar attempts to capture *those properties of language that are logically or conceptually necessary, properties such that if a system failed to have them we would simply not call it a language: perhaps the properties of having sentences and words, for example.* The study of biologically necessary properties of language is a part of natural science: its concern is to determine one aspect of human genetics, namely, the nature of the language faculty. Perhaps the effort is misguided ... The criteria of success or failure are those of the sciences. In contrast, the study of logically necessary properties of language is an inquiry into the concept of 'language.' I should add at once that I am skeptical about the enterprise. It seems to me unlikely to prove more interesting than an inquiry into the concept of 'vision' or 'locomotion.' But in any event, it is not an empirical investigation, except insofar as lexicography is an empirical investigation, and must be judged by quite different standards. (italics added).

This passage prompts a number of observations. First, the context is that of criticism of the well-known view of Montague (1970: 189) where he 'reject[s] the contention that an important theoretical difference exists between formal and natural languages.' Second, Chomsky's reference to 'logically or conceptually necessary properties,' reinforced by a subsequent use of 'logically necessary,' suggests that here he is identifying these two notions of necessity. In subsequent work (1995a: 212), he is careful to point out that conceptual

necessity does not entail its logical counterpart.[15] Third, it is noteworthy that the property of 'having sentences and words' is singled out to exemplify properties of language as such, as this is one of Hornstein *et al*'s 'big facts.' It seems not unreasonable, perhaps, to see at least some of those attempts by commentators to articulate what Chomsky means by conceptual necessity as invoking properties of 'language as such.'[16] Finally, we can now recall an observation we made in Section 1, where it was noted that some (but not all) of Chomsky's ascriptions of a privileged role to Merge include references to 'language-like systems' rather than natural languages.

We can now see, then, a third route to conceptual necessity for Merge/recursion. To put it in terms of the italicised portion of the passage cited above, Merge/recursion is a *conceptual necessity* in the sense that if a system failed to have it we would simply not call it a language.[17]

We can also now better appreciate perhaps why difficulties of interpretation surround the passage from Chomsky (1995b: 285-386) that we introduced in Section 2. Merge's conceptual necessity extends beyond natural language to 'language as such,' and it is *this* latter kind of necessity that Chomsky fails to make explicit in the passage. There he encourages thinking of conceptual necessity *only* in terms of legibility conditions and optimal computation. However, it is clear that he also needs to acknowledge a third way of 'grounding' conceptual necessity, *viz*. *via* the very idea of a 'language.'

This is consistent with how Chomsky (2000a: 101) distinguishes between the two computational operations, Merge and Agree:

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[15] Having introduced the 'standard assumption … that a language consists of … a lexicon and a computational system,' Chomsky (1995a: 169) maintains that with this view ' … we are within the domain of virtual conceptual necessity …' A footnote to this remark says (*ibid*.: 212): 'Not *literal* necessity of course …' (italics added). To our knowledge, there is no technical sense of 'literal necessity.' Accordingly, we cannot see that Chomsky intends anything other than a reference to the familiar notion of logical necessity here, justifying the conclusion that conceptual necessity should not be identified with logical necessity and does not even entail the latter.

[16] There is room for some unease regarding the extension of the phrase 'language as such.' Specifically, if we take it as including those objects studied under the rubric of formal language theory (Hopcroft and Ullman 1979), it will include finite languages that do not display discrete infinity. We shall set such matters aside.

[17] We should again be mindful here of the issues raised by such critics as Postal (2003) and Pullum and Scholz (2010). It seems that the ascription of conceptual necessity to Merge/recursion *via* this route will be legitimate *only if* we add the further qualification that our conception of language is 'derivational' or, to use Postal's expression 'proof-theoretic.'

> One [operation] is indispensable in some form for any language-like system: the operation *Merge* … A second is an operation we can call *Agree* … Unlike Merge, this operation is language-specific, never built into special-purpose symbolic systems and apparently without significant analogue elsewhere. We are therefore led to speculate that it relates to the design conditions for human language.

Thus Merge is considered to be an indispensable property of any language-like system, not because its existence is motivated by legibility conditions, but because its existence is founded in the very notion of a language as a combinatorial system; it is a *necessary* property of any *conceivable* language.[18] Given this necessity, it makes no sense to ask *whether* language has Merge; if Merge is present by virtue of a conceptual necessity in the sense just specified, then we can question its presence only by questioning the presence of language itself. By contrast, the operation Agree does not enjoy the same status; rather, the presence of Agree in the Language Faculty is, we suppose, a consequence of the need to satisfy legibility conditions in an optimal way. Since *specific* legibility conditions and *particular instantiations* of optimal computation are both a matter of empirical inquiry, it follows that the necessity involved here can only be justified by empirical evidence regarding its presence in language. It is precisely for this reason that, unlike in the case of Merge, the *empirical* question of whether Agree is present in language makes sense.[19]

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[18] An additional concern about Chomsky's manipulation of the concept of 'language as such' and its relation to natural language appears in his discussions of 'perfection' in the latter. Thus, in Chomsky (1995a: 151—152), we meet the suggestion that the design of natural language is optimised when compared to artificial systems insofar as it outlaws vacuous quantification, plausibly viewed as a violation of economy of representation. Here, a feature of natural languages that does *not* characterise artificial languages, specifically the avoidance of vacuous quantification, is seen as contributing to the good design of natural languages. By contrast, when considering the difference between Merge and Agree as here, Chomsky characterises the latter as an 'apparent imperfection' in design, and part of the reasoning for this is that agreement mechanisms are 'never built into special-purpose symbolic systems.' Parity of reasoning here surely demands the unacceptable conclusion that the outlawing of vacuous quantification, a constraint that is 'never built into special-purpose symbolic systems,' is also a candidate for an 'apparent imperfection' in natural language.

[19] It may seem to some that there is a conflict between a linguistic property being both conceptually necessary and in need of empirical justification (see, for instance, Smith's use of empirical unavoidability/necessity mentioned in Section 4.) However, such concerns are misplaced. That interface conditions are satisfied is a matter of conceptual necessity and this conceptual necessity is inherited by whatever

We now turn to what we believe is a problematic implication of the above considerations.

6. UG or not UG: where is recursion/Merge?

We have seen that the third route providing an ascription of conceptual necessity to Merge is based, not by invoking core properties of *human* language, but by relying on the concept of *language as such*, and we are taking the latter as uncontroversial for the sake of argument. We have also seen from the remarks cited above from Chomsky (1980: 28-29) that he regards the study of language as such as unempirical and having no significance for the nature of UG in his preferred sense, which, by definition, embodies an *empirical biological* hypothesis. From this, it follows that Merge is *not* in UG, that is, it does not form part of the genetic component of the language faculty.

However, we now reintroduce the hypothesis, first noted in Section 2, and defended at length by Hauser, Chomsky and Fitch (2002), according to which recursion is the only uniquely linguistic and uniquely human property of the language faculty.[20] This hypothesis not only regards the presence of recursive mechanisms (including at least Merge, we suppose) as providing a *genetic* differentiation between, on the one hand, human language and other human cognitive systems and, on the other, between human language and all systems of non-human cognition. It is also intended to constitute an *empirical* hypothesis; thus, the authors (*ibid.*: 1578) acknowledge that evidence for recursive mechanisms in animal systems of cognition would *falsify* the hypothesis that recursion is unique to humans. Furthermore, the presence of recursion in human non-linguistic cognitive domains immediately entails that the hypothesis in its most straightforward form cannot be maintained. Equally, although this possibility is not adverted to, we can suppose that the hypothesis would be falsified by the existence of a human language that does not display recursion.[21] Most importantly, from our perspective, adoption of such a

mechanisms achieve the satisfaction. But the precise nature of interface conditions and of the mechanism(s) that serve them is a matter of empirical enquiry.

[20] See also Fitch, Hauser and Chomsky (2005) for further discussion, and Pinker and Jackendoff (2005), Jackendoff and Pinker (2005) and Jackendoff (2011) for concerns, criticism and alternatives.

[21] The recent discussion between Everett (2005, 2009) and Nevins, Pesetsky and Rodrigues (2009a, b), focusing as it does on detailed aspects of Pirahã morphosyntax, is arguably sufficient to establish the empirical nature of the claim. Supposing the Nevins *et al*. position that Pirahã structures do exhibit recursion eventually proves to be correct; would this be sufficient to render the initial enquiry non-empirical? We think not.

hypothesis firmly locates Merge in UG in direct contradiction to the conclusion reached at the end of the previous paragraph.

Before proceeding with our main line of argument, it is worth pausing on the status of the empirical proposal we are here considering. Setting aside claims regarding the possibility of non-recursive human languages such as Pirahã, and the difficulties in assessing the presence of genuine recursion in non-human systems of cognition (Parker, 2006, 241ff)), it is generally acknowledged that non-linguistic systems of human cognition such as the system of natural numbers do exhibit this property. As far as the simple evolutionary hypothesis put forward by Hauser *et al.* goes, such observations are sufficient to refute it, and Chomsky himself is well aware of this. In response to it (2007: 7), he proposes that there must be 'a genetic instruction to adopt Merge (or some more complex recursive operations) to form infinitely many structured linguistic expressions satisfying the interface conditions.' Thus, the apparent pervasiveness of recursive operations throughout human cognition forces Chomsky to adopt an alternative whereby Merge (or some similar operation) is recruited *via* this 'genetic instruction' from what presumably has to be some antecedently available capacity.[22] We suspect that we are not alone in finding this speculation difficult to assess, and in this context it is noteworthy that some of Chomsky's most ardent supporters have sought to develop different perspectives on Merge while retaining contact with the evolutionary question. However, these developments have themselves embraced some odd claims, an observation that may be indicative of some fundamental insecurities in this area of discussion. Here we mention just one case.

In Boeckx (2009: 48), we find the suggestion that Merge should be decomposed into two 'fairly basic operations,' Concatenate and Copy, the former amounting to set formation plus ordering and the latter determining what should function as the head of a complex linguistic object. There are at least two observations that need to be made about this proposal. First, Boeckx's

[22] Of course, possibilities multiply. Maybe evolution provides a 'generic' recursive capacity that is recruited by distinct cognitive systems, taking somewhat different forms in each; maybe recursion/Merge shows up first in the Language Faculty and is later recruited to the system of natural numbers, the system of planning, etc. Maybe … We should be mindful of Lewontin's (1998: 111) observation that '[r]constructions of the evolutionary history and the causal mechanisms of the acquisition of linguistic competence or numerical ability are nothing more than a mixture of pure speculation and inventive stories.' It is also not clear how to reconcile this ready adoption of the 'genetic instruction' strategy with the unsympathetic attitude to the LOT highlighted in fn. 11.

reliance on concatenation appears to indicate a failure to understand the nature of Merge, at least as this latter is understood in Chomsky's own work. Merge is simply set formation, whereas concatenation involves an additional step whereby order is introduced to the complex product; given this, the proposal to 'decompose' Merge into something including Concatenate is nonsensical.[23] Second, and more importantly in the current context, Boeckx continues (*ibid.*):

> these two operations … need not be linguistically specific. These might have been recruited from other systems that presumably exist. I haven't checked, … But it is the combination of these two presumably general processes that gives you the specificity that linguistic structures display. (Boeckx, 2009: 48)

Thus, here there is no mysterious genetic instruction but arguably it is replaced by something equally unsatisfactory, the coming together of two *presumably* pre-existing capacities. The presumption that these exist although Boeckx '[hasn't] checked' does, we feel, take speculation to a point where the chances of meaningful assessment are remote. And we note that, even if empirical enquiry were to substantiate this degree of speculation, still further checking would be needed to examine whether the two systems in question not only exist but also do not operate in tandem outside the linguistic system. Such joint operation, if it were found to exist, would require Boeckx to fall back on some variant of Chomsky's genetic instruction strategy, one might suppose.

[23] Chomsky himself makes the same point in his response to Boeckx's contribution (p. 52). By the end of the exchange, Boeckx has conceded that when he used Concatenate he didn't mean concatenate at all but simply set formation. Thus, the proposal appears to be one for 'decomposing' set formation into set formation plus labelling – still nonsensical, unless we suppose, as suggested below, that Boeckx's Merge is not to be identified with Chomsky's. A somewhat different proposal to 'decompose' the combinatory process, obviously no longer Merge in Chomsky's sense, appears in Hornstein and Pietroski (2009) with the speculation that it is 'labeling' (which seems to correspond to Boeckx's copying) that constitutes the distinctive human evolutionary step. As the *Iberia* referee points out Chomsky's (1995a, b) own early work on Bare Phrase Structure built the specification of a label (more properly, constraints on possible labels) into the operation of Merge, thereby treating it as a complex and decomposable operation. In more recent work, however, as revealed in his exchange with Boeckx, he sees Merge as simple set formation with the identity of labels being determined by economy conditions on search. The referee suggests that there may be merit in distinguishing different conceptions of Merge notationally, and we could contemplate introducing MERGE_1 to refer to set formation and labelling, MERGE_2 for concatenation and labelling, etc. Nothing but obfuscation is achieved by referring to distinct operations with the same term.

Returning to our main theme, it might be maintained that the proposals developed by Chomsky in his association with the biologists Hauser and Fitch should be kept separate from his more circumscribed linguistic work, particularly as the former contains no mention of Merge, focusing instead on the more general idea of recursion (cf. fn. 1 at the beginning of this paper). However, any such manoeuvre becomes difficult to justify once we acknowledge the three-factor framework first introduced explicitly in Chomsky (2005). There, we find the suggestion that the growth of language in the individual is determined by the interaction of three factors: (1) genetic endowment; (2) experience; and (3) general principles not specific to the language faculty.[24] Given these three factors, a 'principled explanation' of the language faculty and its properties may be achieved, Chomsky maintains (*ibid*.: 9) by shifting the burden of explanation from genetic endowment (Factor 1) to general principles not specific to the language faculty (Factor 3). It is important to be clear that what is subsumed under general principles here includes the two aspects of the SMT from Chomsky (2001) introduced earlier (p. 40), i.e. legibility conditions and optimal computation. Thus the SMT in that formulation is an explanatory thesis, as understood here, embodying the principled explanation that the minimalist approach strives for. However, as noted earlier, the SMT in that formulation is false in that it leaves no room for what is special about language, and in Chomsky (2010: 52) we meet a substantively different formulation as a thesis that holds 'that language keeps to the simplest recursive operation, Merge, and is perfectly designed to satisfy interface conditions.' Thus, Merge is added to the general principles implicit in the optimal satisfaction of interface conditions, and it is clear that Chomsky is proposing here to confine genetic endowment to the recursive operation Merge. In this he is being entirely consistent with the hypothesis he advanced in collaboration with Hauser and Fitch, namely the recursion-only hypothesis, and

[24] Krivochen (2011: 22) illustrates some of the confusion that is all too apparent when the question of the range of recursion in human cognition is considered in the context of this framework. He maintains that '*merge* is the one and only combinatory mechanism in the human mind, regardless of the module,' but goes on to state that the 'only thing we can say for sure is that this operation belongs to Chomsky's … *first factor*, genetic endowment, that is, it is not acquired but given' (italics in original). Here, Krivochen fails to distinguish between that which is genetically given and that which is available *via* the operation of general physical principles, what Cherniak (2005, 2009) refers to as *non-genomic nativism*. This latter, while also 'given', as opposed to 'learned', is not part of genetic endowment. Our understanding is that a capacity that extends across a number of cognitive domains will be a candidate for representing Chomsky's third factor, unless the account is supplemented by something like the genetic instruction strategy mentioned above.

he is explicitly committing himself to the proposition that Merge should be located *inside* UG. Moreover, Merge (*qua* genetic property) will, from the perspective of the passage cited above from Chomsky (1980: 28-29), belong to the "biologically necessary properties of language," and as such it is in need of empirical justification. So long as this is maintained, the third route to the ascription of conceptual necessity cannot be applied to Merge.[25]

How might we respond to the dilemma, if that is what it is, raised by the above considerations? We believe that the answer to this question is rather straightforward, but that it has one rather significant implication for the practice of theoretical linguistics. To approach this, we first return to examples where Chomsky relies on talk of conceptual necessity, and we note that sometimes (but not always) he includes a rider referring to the adoption of a general framework or outlook. For instance, in Chomsky (1995a: 169), a passage already noted in fn. 15, he says: 'So far we are within the domain of virtual conceptual necessity, *at least if the general outlook is adopted*' (italics added). The 'general outlook' in this specific context includes the propositions that there are at least two interface levels and that there is a lexicon and a computational system, and we could, without fear of contradiction, add the proposition that the Language Faculty contains one or more combinatorial operations. Now, we maintain that recognition of the rider renders the ascription of conceptual necessity to the propositions that constitute its content entirely innocent. To see why, we can think informally in the possible worlds framework for interpreting modalities. Thus, it is standard to maintain that a proposition is logically necessary if and only if it is true in all worlds in which the truths of logic obtain - the truths of logic themselves come out as logically necessary and nothing else does. Now suppose that the truths of logic are supplemented by whatever propositions comprise the 'general outlook' and that we now understand conceptual necessity as truth in all worlds in which the truths of logic and our 'general outlook' obtain. Of course, it follows entirely trivially that the propositions comprising our 'general outlook' exhibit conceptual necessity. And the same would be the case for any set of propositions comprising a different 'general outlook.' Thus, the conceptual necessity ascribed to, say, the existence of at least two interface levels amounts to no more than the truth of the proposition that there are at least two interface levels in any system where we assume that there are two interface levels: as true as it is unenlightening.

Now, of course, Chomsky and others, when introducing talk of conceptual necessity, do not always have an appropriate rider, and it seems to

[25] Observe that what we say in fn. 19 above does not apply here, for we have argued that the conceptual necessity associated with Merge is of a different kind from that ascribed to the operation Agree.

us that it is this expository failing that has generated a lot of the heat about conceptual necessity. Put alongside this the fact that riders rarely make the headlines and we have a recipe for conceptual necessity being imbued with a power (and perhaps mystery) that is quite special. Looked at as we suggest here, however, it is no more than a rather tame attribute of the assumptions that comprise a 'general outlook.'

With the above perspective in place, let us return to our 'dilemma,' which the reader should note has now grown scare quotes. We have an argument that suggests that one component of the 'general outlook,' Merge, by virtue of the claim that it is the key occupant of biologically understood UG, is subject to empirical investigation. But that's not what happens with 'general outlooks,' which are assumed or taken for granted, but not empirically investigated.[26] So we have something that looks a bit like a contradiction, that's our 'dilemma,' and we need to get off one horn of it. Which should it be? We have referred earlier (p. 41) to the agnosticism advocated by Pullum and Scholz (2010) with respect to the No Maximal Length claim, an agnosticism that extends to the requirement that a language contain an operation such as Merge. It is of some interest that the different varieties of constraints satisfaction frameworks favoured by Pullum and others, where this agnosticism can be consistently maintained, and, one supposes, a different 'general outlook' is adopted, appear to be largely, perhaps completely, ignored by those following Chomsky's lead.[27] Some may see this as a strange, indeed reprehensible, feature of the discipline, but it is not our role to offer judgement on this. Rather, we simply observe that there is at least one very small exception to this strategy of apparent non-recognition. This appears in Chomsky (1995a: 223), where he opens with: 'A related question is whether CHL is derivational or representational ...' He goes on: '[This question is] not only imprecise but also rather subtle ... [but is] ultimately *empirical*.' (italics added), and he continues to cite some minimal support from phonology for the derivational perspective. In other words, the choice of 'general outlook' is here acknowledged as involving empirical issues.

The general question that this discussion raises is that of whether there is any useful 'space' between logical necessity and empirical truth. The introduction of conceptual necessity into the discourse suggests that perhaps

[26] In a climate where many linguists have made a habit of seeing analogies between what they do and what natural scientists get up to, it may be tempting to think of a 'general outlook' as akin to the foundational assumptions underlying a scientific paradigm in the sense of Kuhn (1962). We shall resist this temptation!

[27] One can only suppose that practitioners of these different approaches somehow escape the scope of Boeckx's universal quantifier mentioned earlier (p. 42).

there is a species of truth that, while falling short of logical necessity, enjoys a status that entails that it is immune to empirical enquiry and, perhaps, revision. With the uncertainties we have discussed involving Merge, it has become clear that Chomsky himself has conceded the empirical vulnerability of a construct regarded elsewhere as instantiating conceptual necessity. With this much conceded, we contend that the natural step is to give up the troublesome concept of conceptual necessity, a concept that has engendered confusion among both supporters and adversaries of Chomsky's general approach, with supporters likely to chant an empty mantra and adversaries prone to see inflated and unjustified content where none exists. What do we gain by relying on this notion of conceptual necessity? To rephrase the question in a not innocent way: What do we lose by not operating with this notion? What is important is to be explicit about what amounts to no more than the foundational *assumptions* of a specific approach to linguistic description.

In conclusion, then, it would appear that if Chomsky wishes to maintain his claims about the biological status of Merge, he, along with those following him, will need to acknowledge the empirical status of the 'general outlook,' acknowledgement that one might hope would lead to some meaningful dialogue between those who have adopted the framework he favours and others whose 'general outlook' has taken a different form.

We hope that this paper has made a convincing case for a debilitating tension between the minimalist justifications of Merge as a conceptual necessity on the one hand, and as a biological attribute on the other. This tension renders the ontological status of Merge uncertain; for, given UG as a biological entity, the question arises as to whether Merge falls inside or outside UG. If it is considered to be inside UG, then a justification for its privileged status as a conceptual necessity becomes urgent if, on the other hand, Merge is to be viewed as falling outside the scope of UG (or even as extending beyond language into other cognitive domains), then the question that arises is that of what makes language a prerogative of our species. We believe that this tension remains unresolved and will continue to be so, unless steps are taken to make explicit what are foundational assumptions in one approach to the nature of language and linguistic theory. With these steps in place, we can hope that proper debate between linguists who currently appear to share little will become possible.

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