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On the Grounding of Syntax – and More*

NOEL BURTON-ROBERTS

Abstract

Chomskyan generative grammar has long been committed to the ‘double interface’ assumption that ‘language’ is a generative computation serving two interface levels of representation, PF and LF.¹ I explore the consequences of this idea for syntax. What is the grounding, the content, of syntax? There are problems here for the double interface assumption, for Minimalism and for the idea that the human Faculty of Language (FL) is a generative computation. These, I argue, can be resolved by grounding syntax exclusively in semantics, i.e. in conceptual-intentional terms. I argue more generally that FL should be identified as a generative computation describable as ‘the language of thought’ (LOT). While Chomsky’s own recent thinking can be understood as pointing in this direction, the proposition that FL = LOT is inconsistent with the double-interface assumption, which Chomsky continues to regard as conceptually necessary.

As regards the ‘and more’ in my title: the discussion leads to reflections – speculative, but no more so than is generally the case in such enquiry – on conceptual relations among ‘language’, ‘faculty of language’, ‘language of thought’ and ‘language acquisition device’, reflections that are both ontogenetic and phylogenetic.

What follows is programmatic, but that is not inappropriate since it concerns a ‘program’. It addresses some questions about syntax that seem to me to arise in the context of the Minimalist Program and its claim that language has a ‘double interface property’. Call it ‘the DIP assumption’.

According to the DIP assumption, linguistic expressions are constituted by both phonological and semantic properties. This is assumed to be conceptually necessary if, with Chomsky, we seek to reconstruct the traditional idea of ‘language as sound with a meaning’ (Chomsky 1995: 2). The attribution of phonological properties to generated expressions addresses, if only indirectly, the sound side of things. The attribution of semantic properties is supposed to address the meaning side.

As an aside, I should mention that I have been developing an idea I call ‘the Representational Hypothesis’ (RH – see, for example, BR 2000, BR 2007, BR & Poole 2006 and BR in prep). Three interrelated contentions of the RH are relevant here: (a) the DIP assumption is not conceptually necessary to the modelling of ‘sound with a meaning’ (note 20 below briefly touches on this); (b) There is just one species of human

* This is an expanded version of a talk given at Edinburgh University (November 2008). I am grateful to the audience for their responses and particularly to Dan Wedgwood for detailed comments on drafts of chapters of my book (in prep), on which this paper is based. I am also grateful to Wolfram Hinzen, Anders Holmberg, Geoff Poole for comments on previous drafts and to Nathan Klinedinst and Neil Smith for discussions in other contexts. And I must acknowledge that, while it poses some queries about Chomsky’s Minimalist Program and ‘perfection’, the paper would have been impossible without them.

¹ See Blevins (2008: 723) on the term ‘Chomskyan generative grammar’. I am using it here to mean grammatical models proposed by Chomsky, up to and including Minimalism. I comment briefly on Distributive Morphology in Note 6 below.

syntax, a syntax grounded in semantics, i.e. it is the syntax of conceptual-intentional structure; (c) The human faculty of language (FL) is not distinct from the language of thought (LOT). I mention the RH here only to indicate where I am coming from. The concern of this paper is to ask to what extent (b)-(c) at least might be consistent with - or even implied by - the Minimalist Program.

This is a difficult question. There are tensions here - in linguistic theory generally, in Chomskyan generative grammar (CGG) and, more specifically, in the Minimalist Program (MP). In respect of the MP, these tensions lead me to ask: What IS syntax in the MP? What is the content of syntax? What is syntax grounded in?

The background to what follows is the sequence (a-c) in (1) – this is central to Minimalism – and the assumption in (2).

- (1)
 - (a) Only conceptually necessary levels of representation are admissible.
 - (b) Just two levels are conceptually necessary: PF and LF. PF is the interface of the linguistic system (FL) with the sensorimotor (SM) systems. LF is its interface with the central conceptual-intentional (CI) system of thought.
 - (c) LF and PF are therefore the only admissible levels of representation, given minimalist goals.
- (2) LF and PF are mutually un-interpretable.

The mutual un-interpretability of LF and PF properties is not defining of Minimalism specifically. It is the basis of Saussurian arbitrariness, for example. More on this below. Also, it is in part what motivates Jackendoff's Parallel Architecture proposal, as we shall see directly.

As noted, within CGG, the overwhelming majority of lexical items, and all expressions generatively projected from them, are thought of as double-interface objects. They are objects having properties interpretable at the two interfaces (i.e. phonological and semantic properties). Jackendoff (1997, 2002, 2003, see also Culicover & Jackendoff 2005) rejects this. He denies that there are (or can be) representations/expressions that 'mix' phonological and semantic properties. He describes such mixes as 'formally incoherent'. For Jackendoff, a phonological property is a property of and only of a purely phonological expression. A semantic/conceptual property is a property of and only of a purely semantic/conceptual expression.

However, Jackendoff extends this idea to SYNTACTIC features/properties. He holds that representations/expressions that 'mix' syntactic properties with either semantic or phonological properties are also 'formally incoherent'. So, a syntactic property, for Jackendoff, is a property of and only of a syntactic expression. Just as phonological expressions have only phonological properties and semantic expressions only semantic properties, so syntactic expressions have only syntactic properties. This yields the 'representational modularity' of Jackendoff's Parallel Architecture (see also Jackendoff & Culicover's 'Simpler Syntax'). On these terms, phonology, semantics and syntax are three separate, informationally encapsulated modules - three mutually independent 'languages of the mind' (Jackendoff 1997: 41).

In respect of syntax, Jackendoff's modularity would seem to encounter a grounding problem. This grounding problem does not arise with phonology or semantics. Take phonology first. Phonology is - in and of itself - grounded. Hale & Reiss (2000) notwithstanding, the null hypothesis in phonological theory is that the

content and thus grounding of phonology is phonetic: it lies in (the mental representation of) articulatory and/or acoustic properties. Phonological features have ‘intrinsic phonetic content’, in short (Postal 1968). Semantics, too, is grounded in and of itself. The intrinsic content and thus grounding of semantics is at least conceptual, if not conceptual-intentional. It is the stuff of thought.

The question is: What is an informationally encapsulated (modular) SYNTACTIC property? What is the content and thus the grounding of syntax on Jackendoff’s modular terms? You might respond that syntax is grounded in category and structure. But category and structure don’t just exist *in vacuo*. Category and structure must themselves be grounded. What I mean is: a given category must be the category OF something; a given structure must be the structure OF something. Given Jackendoff’s modularity claim, the question is: category/structure of what?

Consider Fig. 1, for example, adapted from Jackendoff (2003: 659).

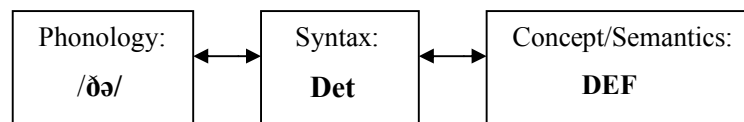


Figure 1. Jackendoff’s representational modularity

In Fig. 1, /ðə/ and DEF are each grounded, as just explained.² But what of Det (for ‘Determiner’)? What is this purely syntactic object? Det is generally thought of as a syntactic category. But what is it supposed to be the category OF? Given Jackendoff’s modularity, it can’t be the syntactic category of /ðə/, for that would imply that the phonological representation /ðə/ actually belongs to, or has, a syntactic category. This would undermine the modularity claim; it implies a ‘mixed’ - syntactic-phonological - representation. For parallel reasons, we cannot assume that Det is the syntactic category of the concept DEF. That too would imply ‘mixed’ representation - in this case, syntactic-semantic. Besides, it is hard to accept, assuming it is an element of conceptual structure, that DEF has ‘Det’ as its category. The more usual way of thinking of the relation between Det and DEF is that DEF provides Det with its semantics. But this is ruled out by Jackendoff’s modularity thesis for the same reason: it implies that the syntactic entity Det actually has a semantics and thus, again, that there are (‘mixed’) syntactic-semantic entities.³

In short, if we take seriously Jackendoff’s contention that syntax is an encapsulated module, syntax is *sui generis*. It has no content, is not grounded in anything. It can’t involve category and structure as usually understood since, being informationally encapsulated, it does not attribute category or structure TO anything. What is syntax on these terms? The answer seems to be that syntax is... well, it’s just syntax.

The overarching general contention of Jackendoff’s proposal is that what in CGG are referred to as ‘lexical items’ don’t exist. Rather, what we are dealing with here are simply RELATIONS - relations between separate objects that do exist. The relations are captured by the arrows in Fig. 1. This implies that the so-called ‘lexical items’ of CGG

² Assuming ‘DEF’ (for ‘DEFINITE’) is indeed an element that figures in conceptual structure.

³ Notice also that the Det-DEF correlation presupposes that Det is correlated with /ðə/ - rather than, say, with /ə(n)/. Thus suggests the semantics is sensitive to a syntactic-phonological correlation, contrary to the modularity claim.

are entities only in an abstract, mathematical, set-theoretical sense - i.e. they are in reality merely sets.

Now, as I explain below, I am entirely in sympathy with this idea as far as the relation between phonology and semantics is concerned - i.e. the pair {phon, sem}. But what I have sought to show above is that Jackendoff's modularity is problematic if we include syntax in this and assume that we are dealing with triples {phon, sem, syn}. If syntax is to have grounded content, it cannot be regarded as just a further, independent, self-justifying, self-explanatory, member of a merely set-theoretical triple.

As indicated, Jackendoff's proposal is a reaction against CGG in these matters. So what does CGG have to say about the grounding of syntax? First I suggest that CGG offers what might seem a rather clear account of the grounding of syntax. Then I turn to problems posed by this account, particularly when CGG takes the form of Minimalism.

According to the double interface (DIP) assumption of CGG, syntax is doubly grounded. It is grounded in both phonology and semantics (at least in the overwhelming majority of cases - see below). Now, as explained, phonology and semantics are themselves grounded - respectively, by their very natures. Presumably, grounding is transitive. The grounding of both phonology and semantics is therefore inherited by syntax.

In CGG, then, lexical items and expressions composed of them are SYNTACTIC objects. Syntactic categories and structures are the categories and structures OF double-interface objects – objects with a phonology and a semantics. On these terms, phonological and semantic features are PROPERTIES OF syntactic objects.

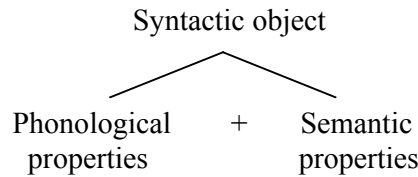


Figure 2. The double grounding of syntax in CGG

This amounts - contra Jackendoff - to an account of lexical items that is more than merely set-theoretical. Syntax, on these terms, is not just an additional, independent, self-justifying member of a set-theoretical triple. There is a real object actually constituted by phonological and semantic properties – a real SYNTACTIC object.⁴

This reflects the centrality of syntax in CGG - the 'syntacticocentrism' of CGG that Jackendoff objects to.⁵ Of necessity, the syntactic computation of CGG targets - selects and merges - SYNTACTIC objects. However, given the grounding of CGG's syntactic objects, phonological and semantic features also enter the syntactic

⁴ In this connection, it is significant that Chomsky (e.g. 1995: 219) refers to such objects as pairs, rather than triples – taking for granted their syntactic nature. Notice also that Chomsky refrains from referring to them as ORDERED pairs. An ordered pair is licensed by the existence (or postulation) of an antisymmetric relation; but notice that the relation between phon and sem represented in Fig. 2 is symmetric: phonology and semantics are CO-properties (co-constitutive) of the syntactic object.

Furthermore, I don't believe this reference to pairs can be taken to indicate that Chomsky, like Jackendoff, thinks of lexical items and structures composed of them solely as set-theoretical entities. There's nothing that can't be thought of in set-theoretical terms if it suits our purpose, but that doesn't mean that everything we think of in such terms is a merely set-theoretical entity.

⁵ Though one cannot help noticing the central, mediating role of syntax in Figure 1 itself.

computation because they are constitutive properties of the syntactic objects that the computation manipulates. The syntactic computation projects the double-interface character of lexical items onto an infinite array of more complex objects, which are therefore double-interface objects themselves.⁶

There are exceptions, of course. Not all syntactic expressions have both phonological and semantic properties, i.e. not all are double-grounded. ‘Null’ (‘empty’) categories such as big *PRO* and little *pro* are syntactic objects that have semantic but not phonological properties. Conversely, complementiser *that*, expletive *it* and (on some accounts) expletive *there*, for example, are syntactic objects that have phonological but not semantic properties.

It is significant, though, that no syntactic expression of CGG lacks both phonology and semantics. This is predicted by the above account of the grounding of syntax in CGG. The category and/or structure of an expression that lacked both phonology and semantics would not be the category or structure OF anything. Such an expression would be ‘purely syntactic’. It would be completely ungrounded. It would have no content.

As compared with Jackendoff’s encapsulated syntax, then, the DIP assumption of CGG would seem to offer an intuitive conception of the content/grounding of syntax. But I have a problem here. On the one hand, I hold - with CGG but, apparently, contra Jackendoff - that syntax does have to be grounded. On the other hand, I wholly agree with Jackendoff in holding that it is, as he puts it, ‘formally incoherent’ to suppose that linguistic expressions/representations can ‘mix’ phonological and semantic properties.

My reason for agreeing with Jackendoff lies in Saussurian arbitrariness. As far as I am concerned, the reason why the ‘sound~meaning relation’ is arbitrary (or at least conventional) lies in the fact that PHONOLOGICAL CONTENT IS SORTALLY DISTINCT FROM SEMANTIC CONTENT. Given how they are respectively grounded, their respective contents are sortally incompatible. It follows from this, against CGG, that no real/actual object (and hence no ‘item’ or expression) can have both kinds of content/property.⁷ Jackendoff doesn’t put the matter in precisely this sortal way, but I assume this is why he objects to representations/expressions/items that ‘mix’ those properties. Myself, I would replace Jackendoff’s ‘formally incoherent’ with ‘sortally incoherent’.

Now, since CGG clearly does countenance mixed (phon + sem) syntactic entities, you might have supposed that CGG would want to reject this sortal line of reasoning. Not so, in fact. Recall (2) above, which CGG subscribes to: properties interpretable at the PF interface (phonological properties) are not interpretable at the LF interface and properties interpretable at the LF interface (semantic properties) are not interpretable at the PF interface. This CGG admission of the mutual un-interpretability of phonological and semantic properties precisely amounts to an acknowledgement of the sortal incompatibility of phonological content/grounding and semantic content/grounding.

In this connection, consider CGG’s principle of Full Interpretation. An LF representation is well-formed if and only if fully interpretable by the conceptual-intentional (CI) system, and hence does not include phonological information, which the

⁶ Despite claims made for them, ‘late (lexical) insertion’ models that go under the banner of Distributive Morphology do not alter the general (DIP) assumption in any substantive way. See BR & Poole (2006: 617-8) for discussion.

⁷ By ‘real/actual object’, I mean anything that is more than a merely set-theoretical entity. There is no objection to allowing that RELATIONS may hold between (separate) sortally incompatible objects and hence no objection to allowing that sets may have sortally incompatible members. What I am saying in the text is that at least one relation CANNOT hold between two sortally distinct objects, namely the co-property (co-constitutive) relation countenanced in Fig. 2. See also Note 8 below.

CI system cannot use (such information is CI-incoherent). Conversely, a PF representation is well-formed if and only if fully interpretable by the sensorimotor (SM) systems, and hence does not include semantic information, which the SM systems cannot use (such information is SM-incoherent).

The question then is: how can Full Interpretation be reconciled with the DIP assumption that syntactic expressions are (in the overwhelming majority of cases) constituted as (phon + sem) ‘mixtures’?

CGG resolves this matter with an axe. It is syntactic (lexical) items that enter the syntactic computation. Constituted as double-interface objects, these syntactic objects necessarily pied-pipe their phonological and semantic properties into the computation. However, in order to satisfy Full Interpretation at the interfaces, the computation is obliged to dis-integrate, or dismantle, these double-interface objects into their component properties. The axe is wielded at Spell Out (either once and for all, or ‘phase’ by ‘phase’). Spell Out splits apart the properties that constitute the double-interface object, sending its phonological properties off to the phonological component, to be interpreted eventually at PF, and its semantic properties off to be interpreted eventually at LF.⁸

A conceptual question arises here. Why should we assume that phonological and semantic properties could possibly be constitutively conjoined in the first place, when it is acknowledged, within CGG itself, that such properties are mutually un-interpretable - and thus, in effect, sortally incompatible? Or, if that conceptual question is not to your taste, here’s its methodological correlate (see also Note 8). Why posit such double-interface objects, only to be faced with the necessity of an operation that splits them? Were phonology and semantics separate in the first place – as would seem necessary anyway given the acknowledged necessity of splitting them apart - there would be no need for such an operation. Its elimination should be indicated by minimalist principle.

Full Interpretation has a consequence that is at least surprising given the enterprise of modeling ‘sound with a meaning’. For it follows from the assumptions of CGG that those lexical items that do have both sound and meaning – i.e. all words (bar complementiser *that* and expletive *it* and *there*, etc.) and hence all expressions composed of words - are not interpretable at EITHER of the interfaces. Take the word *cat*. It is ‘a sound with a meaning’. On the DIP assumption, it is constituted as $[/kæt/+CAT]_N$. But the phonology of *cat* ($/kæt/$) is not interpretable at LF and its

⁸ The very fact that a splitting operation is thought to be required in CGG supports my contention that ‘lexical items’ (and anything composed of them) are thought of as real objects in CGG, i.e. as more than just sets. A set $\{x,y\}$ is licenced by nothing more than a RELATION of some kind holding between x and y - and there is no reason to suppose that x and y are not separate anyway. Hence, were CGG’s lexical items thought of simply as sets, there would be no conceivable motive for splitting them (separating their already separate members). Indeed, on a merely set-theoretical interpretation of CGG’s ‘lexical items’, the splitting operation could only be interpreted as dismantling the set and dissolving the relevant relation.

The reader may need reminding here what I am arguing and what I’m not. I am NOT arguing against a mere (psychological) relation holding in this context (and so I’m NOT arguing against a merely set-theoretical account). Quite the contrary; the Representational Hypothesis constitutes a proposal as to what relation is involved (see the ‘Coda’ below). What I am arguing against is the REIFICATION OF RELATIONS by the positing of (psychological) objects - ‘lexical items’ - doubly constituted by the *relata*. My argument - and quarrel with CGG - is that CGG engages in this reification. It is noticeable that the precise nature of the relation is never - but never - discussed in CGG. This, I suggest, is because the co-constitutive relation represented in Fig. 2 is taken for granted.

semantics (CAT) is not interpretable at PF. As a consequence, their combination [/*kæt*/+CAT] - the word itself, *cat* - is not interpretable at either interface. For Full Interpretation, every such un-interpretable double object must be split into two separate - and separately interpretable - objects. But neither of the two resulting objects is the putative double object itself - the word itself, the very thing that's supposed to be 'sound with a meaning'. The word *cat* exists at neither LF nor PF, it having been dismantled at Spell Out.

This presents a problem when we move from CGG generally to Minimalism specifically. The minimalist assumption is that LF and PF are THE ONLY ADMISSIBLE levels of representation (1c above). But, we have seen, words (and thus all expressions composed of them) - conceived of as double-interface entities - are not interpretable at either interface. Indeed, they don't actually exist at either interface. They have been split apart - dismantled - at Spell Out. As a consequence, if (as in Minimalism) LF and PF are the only admissible levels of representation, we have, in Minimalism, a conception of the linguistic computation ('language') that cannot admit of the existence of words or, therefore, of anything composed of words.

Now, I personally believe there is a conception of the human linguistic computation in which this consequence (that it doesn't/can't deal in words or anything composed of words) is not in the least disturbing - and is in fact conceptually necessary. It is this conception of 'language' that I'm leading up to. But it is disturbing - barely coherent, surely - in the context of CGG's general enterprise of reconstructing 'language as sound with a meaning' and doing so in terms of a (supposedly necessary) double-interface linguistic computation.

That consequence has a further consequence, for syntax and its grounding within the double-interface framework. This brings me to my main point. Take category first. I have argued that, in CGG, a syntactic category is the category of a double-interface (phon + sem) object. But we have just seen that such objects are not, as such, interpretable at either of the interfaces. Now, if syntactic categories are supposed to be categories OF double-interface objects, which are not as such interpretable at the interfaces, then syntactic category itself cannot be interpretable at the interfaces. Indeed syntactic categories - understood in DIP terms - can't actually exist at either of those interfaces, because the double-interface objects they are categories OF don't exist at either interface, having been disbanded at Spell-Out. The same goes for syntactic structure. Given the double grounding of syntactic structure, syntactic structure is not interpretable, and indeed can't exist, at either of the two admissible levels of representation, because the things that such structures are supposed to be the structures OF don't exist at the interfaces. Consequently, if the two interfaces PF and LF are the only admissible levels of representation, Minimalism suggests that syntactic category and structure - understood as the category/structure of double-interface expressions - are not admissible concepts.

There is something seriously wrong here. So I am led to ask which of the following is the case:

- Either (a)** the double grounding of syntax itself (indeed CGG's whole conception of the nature and content of syntax) is fundamentally misguided and should be abandoned;
- Or (b)** I am fundamentally mistaken in my assumptions (see Fig. 2) about the grounding and thus nature of syntax in CGG and in Minimalism especially.

Needless to say perhaps, I favour option (a). That requires me to offer an alternative account of syntax and its grounding. I'm coming to that. But I must be even-handed and consider the (b) option, that I am mistaken about the grounding of Minimalist syntax.

Actually, that's a bit disingenuous. I want to consider the possibility that I'm mistaken about the grounding of syntax in Minimalism only because I want to show how difficult it is to decide whether I'm mistaken. For there is in fact a tension, or instability, in Minimalism surrounding the nature of the linguistic computation and the grounding of syntax.

Here goes on (b), then. On what grounds might I be regarded as mistaken about the double grounding of syntax in Minimalism? Consider the 'T' model:

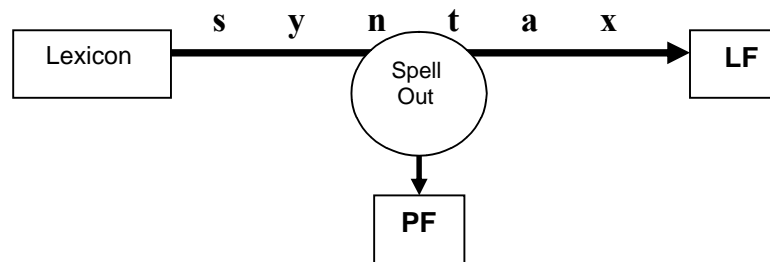


Figure 3. The 'T' Model.

The 'T' model suggests, more explicitly than the 'Y' model did, that syntax (category and structure) continues on into the 'covert' computation to LF. In other words, it suggests more explicitly that there is one continuous syntactic computation that targets syntactic elements whether they have phonological properties or have lost them through Spell-Out. On these terms, syntax (category and structure) must be such as to survive Spell-Out (the loss of phonology). This is contrary to the double-interface rationale of syntactic category I offered above, suggesting that syntactic category and structure are not in fact explainable in double-interface terms. So maybe I was mistaken.

However, if syntactic category and structure are such as to survive Spell-Out - if syntax persists after phonological features are stripped out - then phonological properties are in fact irrelevant to the nature, the content and grounding, of syntactic properties. But then, what IS the nature of syntactic properties? And why should (or could) phonological features enter the syntactic computation at all? Methodologically (in minimalist terms): why introduce phonological features into the computation in the first place only to be faced with the necessity of stripping them out?

The paradox is that these questions arise within the very framework that makes the inclusion of phonological features within the syntactic computation seem conceptually necessary. For how could the putative double-interface property of language (the conception of 'language' as 'sound with meaning') be served except by having phonological features enter the syntactic computation? If those lexical items that are constituted in part by phonological properties are selected for merging by the syntactic computation, how could phonological features not enter the syntax? There is a tension here. The post-Spell-Out persistence of syntactic category and structure suggests that, in allowing phonological features to enter the syntax (indeed insisting on that, in

consequence of the DIP assumption), Minimalism has an unstable concept of syntax (its grounding/content).⁹

If syntax persists regardless of phonology, phonology can have no business figuring in syntax. This would seem to imply that the computation is just syntactico-semantic. Syntactic category and structure, on these terms, should be such as to be fully, exclusively, interpretable at the LF interface - in other words, fully and exclusively grounded in conceptual-intentional terms, i.e. in semantics. One might put it this way: on this conception of the grounding of syntax, syntax is_[df] the syntax-of-semantics.¹⁰ We are talking of ‘conceptual structure’ here - the structure of conceptual-intentional representations and the categories over which such structure is defined - whatever, according to your favoured theory, those categories might be.

All this is consistent with, indeed suggestive of, a view of the computation somewhat in the spirit of Fodor’s ‘language of thought’ (LOT) - see, most recently, Fodor (2008). I have reservations about aspects of Fodor’s own conception of the language of thought. Nevertheless, his arguments for the very existence of something describable as ‘LOT’ appear compelling.¹¹ However it’s conceived (notwithstanding disagreements, or uncertainty, as to what ‘semantics’ precisely consists in), no-one who admits of LOT would want to deny that, if anything is, LOT is a locus of semantic properties. More strongly, it is arguable (if only on grounds of parsimony) that LOT is THE only locus of semantic properties - see Fodor (1998: 9, 2008: 73) on this and my (2007) discussion (also Note 17 below). Furthermore, I hold that you can’t have semantics without syntax. No-one who admits of LOT would want to deny that it has (must have) a generative syntax - i.e. a syntax conceivable as the syntax-of-semantics.

On these terms, contrary to what Jackendoff appears to assume, it cannot be the case that syntactico-semantic representations involve sortal ‘mixing’. They can’t be ‘formally incoherent’. Even Jackendoff admits of ‘semantic/conceptual STRUCTURE’.¹²

LOT, then, is a generative computation. And, for those who accept that there is such a thing, LOT has a pre-eminent claim to be a generative computation that is natural, innate, and invariant across the species – and thereby a claim to be THE human generative computation. Now, this is how Chomsky conceives of the faculty of language (FL). FL, by hypothesis, is the single, invariant, uniform, natural, innate,

⁹ Or admits of more than one species of syntax - $\text{syn}_{(\text{phon})}$ serving PF and $\text{syn}_{(\text{sem})}$ serving LF. Of course, the usual way of reconciling (i) a multiplicity of species of syntax with (ii) a single continuous syntactic computation is to say, in effect, that the latter - (ii) - has the job of DERIVATIONALLY CONVERTING one species of syntax into the other. It might be thought that, as elsewhere in linguistic theory (see e.g. Hale and Reiss 2000), ‘transduction’ could be appealed to here. I believe there are profound sortal confusions involved in this appeal (and a misunderstanding of the nature of transduction) but I don’t have the space to go into it here (see Carr 2000, Young 2006).

¹⁰ The idea that syntax is exclusively grounded in semantics - is the syntax-of-semantics - is not the assumption of most working linguists within CGG and/or Minimalism, where syntactic structure is ‘first’ generated – and the debt to PF discharged - and only ‘then’ assigned a semantic interpretation (or derivationally converted into a semantically interpretable object). Here, if anything, it’s round the other way: semantics is_[df] the semantics-of-syntax (see above on DEF supplying Det with its semantics).

¹¹ Wolfram Hinzen has put it to me that, while we are in substantial agreement, he cannot (and doesn’t believe I can) go along with this appeal to Fodor’s LOT. That may well be so (though picking apart the details is beyond the scope of this paper). Please assume I am availing myself of Fodor’s term for want of any better. Given the comments below, I do hold, though, that the ‘L’ of ‘LOT’ must be taken seriously.

¹² Of course, it depends on what Jackendoff means by ‘syntax’. Possibly, Jackendoff has two species of syntax, one of which ‘mixes’ happily with semantics (as in ‘semantic/conceptual structure’) and the other not (given ‘representational modularity’).

generative, human computation. Should we not conclude, then, that Chomsky's 'faculty of language' is not distinct from 'the language of thought' itself?

The stumbling block in the way of that conclusion is that, while LOT has all the general properties that Chomsky attributes to FL, it does not include phonology. It is precisely the putative inclusion of phonology in FL that distinguishes FL and LOT. On the other hand, lacking phonology, LOT does not deal in WORDS and, I have argued, it is anyway questionable whether the minimalist conception of FL's syntax itself can admit of words.

So, just how far off the mark is my suggestion that syntax is grounded exclusively in conceptual-intentional terms – that FL and LOT should be identified - when it comes to Chomsky's own thinking? Not so far off, I suggest. But here's the instability (tension). On the one hand, Chomsky's continued adherence to the DIP assumption (and thus to the inclusion of phonology in syntax) is thoroughly inconsistent with identifying syntax as the syntax-of-semantics and the identification of FL with LOT. As noted, it is precisely phonology that forces us to distinguish FL and LOT. On the other hand, as anyone at all familiar with his work knows, Chomsky has repeatedly deplored phonology as the fly in the ointment of his 'perfection' heuristic. For example:

(Q1) The whole phonological system looks like a huge imperfection, it has every bad property you can think of. (2002: 118)¹³

Concomitantly, Chomsky has sought to downplay, or sideline, the role of phonology and the SM interface (PF) in the computation. Phonology is relegated to an 'extraneous' 'periphery' and thereby excluded from the 'core systems of language'.

(Q2) ...language "imperfections" arise from the external requirement that the computational principles must adapt to the sensorimotor, apparatus, which is in a certain sense "extraneous" to the core systems of language.... (1995: 265)

Equally, for Hauser, Chomsky & Fitch (2002), phonology belongs within a 'broad' but not 'narrow' concept of human language. In a similar vein, Chomsky (2006) refers several times to a putative 'primacy' or 'priority' of the CI interface and, by comparison, to phonology and the SM interface as merely 'ancillary'.

(Q3) We are assuming that FL provides at least instructions for the CI and SM interfaces, the former having priority (perhaps near-tautologically, insofar as the more radical thesis can be sustained). (2006: 11)

¹³ Standing back, it is difficult to know what to make of this. Phonology just is AS it is and empirical language study should be such as to bite on that bullet. But it depends on what you mean by 'language (study)'. I suggest the problem lies, not in phonology, but in an instability in what exactly Chomsky means by 'language' (an instability that has gone under the label of 'the tension between explanatory adequacy and descriptive adequacy'). I address this below and in Burton-Roberts (in prep). (Incidentally, Carr (2000, 2006) offers a critique of attempts within phonological theory to make phonology appear less 'ugly' in the eyes of CGG.)

The idea here is that there is an ‘asymmetry’ (see Q4 below) in the importance to be attached the CI and SM interfaces. Chomsky suggests there are empirical arguments that support this asymmetry. Be that as it may, no such asymmetry is formally/theoretically substantiated in the assumption that the objects manipulated/generated by the computation are (PF-LF) ‘pairs’. Given that the double-interface architecture is intended to reconstruct ‘language as sound with a meaning’, the CI and the SM interfaces would seem to have exactly equal status/importance.

I suggest that, insofar as an ‘asymmetry’ can be contemplated here, it needs to be formulated in a more forthright - and thus more radical - manner. Rather than referring to a putative ‘primacy’ or ‘priority’ of the CI interface, we need to say (without hedge or qualification) that the CI interface IS THE interface. But that is impossible given Chomsky’s continued adherence to the DIP assumption, and hence the inclusion of phonology within the computation. It is this that calls for hedging reference to ‘primacy’.¹⁴ Chomsky’s use of ‘near tautologically’ in Q3 is equally symptomatic of the instability I’m seeking to point up. A proposition either is or is not a tautology. Nothing is a ‘near tautology’. Insofar as a tautology can be approached, the tautology that is being approached in Q3 is: the human linguistic computation provides instructions for ONLY the CI interface.¹⁵

Indeed, were we to find principled grounds for excluding phonology from the computation - thereby abandoning the DIP assumption - that would render all talk of an ‘interface’ between FL and LOT vacuous. For, with phonology excluded from FL, there would be no grounds for distinguishing FL and LOT. FL would be LOT. If only in terms of parsimony (and thus Minimalism), that is a conclusion to be desired.

Chomsky in his recent work does actually make explicit reference to ‘a “language of thought”’:

- (Q4) Generation of expressions to satisfy the semantic interface yields a ‘language of thought.’ If the assumption of asymmetry is correct, then the earliest stage of language would have been just that: a language of thought, used internally. It has been argued that an independent language of thought must be postulated. I think there are reasons for skepticism, but that would take us too far afield. (2006: 9)

The last sentence of Q4 can (and, given the context, surely must) be interpreted as expressing scepticism, not about the very existence of LOT, but rather about the INDEPENDENT existence of LOT – in other words, whether LOT and FL are in fact independent, separate. So interpreted, this is the query that I am articulating in this paper.

The proposition that FL = LOT would resolve a problem evident in Q3, furthermore. This bears on an ambiguity of the term ‘language’ (and ‘UG’) in CGG. I believe there was a time, in the early days of the generative enterprise, when the theory of ‘language’ was taken to be the theory of all particular languages. ‘Language as sound

¹⁴ Furthermore, as regards ‘core-periphery’, Chomsky himself comments (1995: 163, Note 3) ‘The core-periphery distinction, in my view, should be regarded as an expository device, reflecting a level of understanding that should be superseded as clarification of the nature of linguistic inquiry advances’.

¹⁵ ‘The more radical thesis’, incidentally, is Wolfram Hinzen’s (2006: 179) that ‘we should try deriving certain empirical properties of thought contents’ from the structures generated by FL (the structure of CP in particular).

with a meaning' can only be interpreted as continuing that tradition, for sounds have meaning only in, or given, some particular language (which sounds have which meanings holds only in some particular language). UG, on this interpretation, was the theory of what all particular languages had in common. Insofar as UG theory concerned 'a real object of the natural world' (Chomsky 1995: 11) - i.e. the human faculty of language, FL – it concerned what was regarded as a 'language acquisition device', a device for the acquisition of any particular language. Now, regarded as a 'language acquisition device', FL is NOT itself a generative computation. Rather, it is something that, by hypothesis, makes possible the (speedy, effortless) ACQUISITION OF a generative computation (some particular language - I-language, for Chomsky).¹⁶

However, within CGG, the term 'language' has undergone a change over the years. Or rather, while not exactly abandoning that earlier sense, it has acquired another sense, in tension with the former sense. In this later sense, the theory of language is not the theory of all particular languages (and their acquisition) so much as the theory of the one human language, considered as a (indeed the) generative computation itself. This, as I understand it, is how Chomsky now wishes to conceive of FL - as a generative computation in itself - and is, I believe, how FL is to be understood in Q3.

The problem in Q3, then, is this. It is impossible that the human faculty of language, FL, provides - generates - instructions for the CI and SM interfaces. In saying that FL itself - as against some particular I-language - does this, Chomsky is effectively

¹⁶ If the cognitive rationale of FL is exhausted by the language acquisition function - i.e. if 'FL' and 'LAD' are strictly equivalent (FL=LAD) and that's all there is to be said about FL - then, viewed from an evolutionary/phylogenetic perspective, we face a (chicken/egg) circularity, conceptually and empirically. Conceptually: if acquisition of a particular language is impossible without X, the evolution of X must predate any particular language. But, in advance of there being a language to acquire, X cannot BE a 'LAD' specifically. Empirically: while LAD, by definition, is necessary for language acquisition, it is not sufficient. Exposure to 'primary linguistic data' is also necessary. But no such data will be available at the point of the necessarily prior evolution of X.

This is an argument against FL=LAD, not an argument against attributing to FL a necessary role in language acquisition. That is, we could still attribute to FL a role in acquisition provided that role is no more than an incidental, epiphenomenal by-product of FL's primary rationale (just as flight is of the thermo-regulatory function of butterfly wings). The question then is: what IS the primary cognitive rationale of FL? The proposal that FL=LOT provides a not implausible answer - and I can think of no other (more on this below). I assume that this is what Q4 envisions, taking a phylogenetic perspective.

However - turning from the phylogenetic to the ontogenetic - if FL=LOT, we cannot say that FL is an 'initial state' that (ontogenetically) develops/turns into a mature individual's particular language ('final state') without committing ourselves to mature thought being impossible without a particular language (and thereby to a strong form of the linguistic relativism of thought, aka the 'Sapir-Whorf hypothesis'). For, given the combination of (a) FL=LOT and (b) the 'initial state' idea, it is LOT that develops/turns into a mature individual's particular language. And that amounts to saying that a mature individual's particular language IS her (particular) language of thought. Against this, Chomsky (2000: 76) presents compelling, readily recognisable, introspective evidence that we 'can think without language' (and it is clear he means: think independently of the particular language we speak). In the light of that evidence, we must allow that individuals have some kind of access to LOT ('conceptual structure') that is independent of (not mediated by) their acquired particular language.

FL-qua-LOT has a necessary role in language acquisition in at least this crucial respect: it gives you something to talk about in your acquired language – namely, your thoughts. This is crucial if, as I (and, I think, Chomsky and Hinzen) would argue, that's ALL there IS to talk about. (If you don't like 'talk about', you could, I suppose, replace it with 'express' or 'articulate'.) Incidentally, it is not guaranteed that your thoughts - or what you think of as being your thoughts - won't change in the light of how you try to talk about them. Hence, talking about your thoughts is also a kind of thought.

committed to the proposition that the innate FL itself generates PF-LF pairs (consistent with the DIP assumption). This, it seems to me, cannot be true. It is only particular languages that could provide paired instructions for the CI and SM interfaces. The idea of PF-LF pairs was supposed to reconstruct ‘language as sound with a meaning’ (SWAM). But, as noted, SWAM is a phenomenon of and only of particular languages. ‘SWAM’ in this context refers to speech – and speech, by definition, is speech-in-a-particular-language. Since pairings of sound and ‘meaning’ are conventional (non-natural), they differ from one particular language to another. That, after all, is why particular languages have to be acquired (are not given by the hand of nature).

In sum, there IS no single (invariant, universal), natural, innate generative system that provides paired instructions for the CI and SM interfaces. If a generative system is_(df) a system that generates objects of a certain kind, then, as long as such objects are thought of as PF-LF pairs, FL itself cannot be regarded as generating such objects. Hence FL itself cannot be regarded as a generative system.

By contrast, there is no conceptual objection to the idea that FL is a generative system – and a natural one (free of Saussurian arbitrariness) - if what it generates are objects having just syntactico-semantic properties. And that, by definition, is precisely what LOT does.

So, if we think of FL itself as a generative system - and I believe Chomsky does - we need principled grounds for excluding phonology from FL and thereby obviating the distinction between FL and LOT. Furthermore, if FL = LOT, then a really radical minimalist thesis follows directly: the number of ‘interfaces’ (considered as formally defined ‘levels of representation’) = 0.¹⁷ And the number of species of human syntax = 1 (a syntax in – and constitutive of - the language of thought, *Mentalese*). Again, only the double-interface assumption stands in the way of these desirable conclusions.

Chomsky suggests that ‘perfection’ is to be assessed in terms of ‘interface conditions’: language is perfect to the extent that the thesis/heuristic that ‘language is a perfect solution to interface conditions’ (2006: 3) can be sustained. Now, he assumes there are two sets of interface conditions, those imposed by SM systems and those imposed by the CI system. Against this, Q1 and Q2 suggest that the conditions imposed by the SM interface - since they are the acknowledged cause/locus of imperfection – must, somehow and/or ‘in a certain sense’ and/or to some degree, be discounted in contemplating perfection (see Q3). This is also indicated if imperfection is held to be lack of interpretation at LF, i.e. in CI terms. See Chomsky (2002: 112): ‘the imperfection is uninterpretable features’ - and the context makes clear that Chomsky here means uninterpretable at LF.

So let me speculate what ‘perfection’ might actually amount to in the final analysis. What standard or yardstick of perfection can we appeal to? I suggest it is LOT that provides the yardstick. I’m not of course suggesting that LOT is perfect - the suggestion is barely meaningful. What I am suggesting is that it is LOT that sets the (implicit) standard against which the degree of perfection of FL itself is being judged. On these terms, FL (‘language’) is perfect precisely to the extent it approximates to LOT. And the endstation on this conceptual route is that FL would be wholly perfect if there were no FL but LOT (i.e. if ‘language’ = LOT).

In the light of this, consider Jackendoff’s scathing summary of Chomsky’s notion of perfection: ‘In other words, language could be perfect if only we didn’t have to talk’

¹⁷ In this respect I am at one with Fodor: ‘I think that LF is a level of description not of English, but of *Mentalese*...’ (Fodor 2008: 78, Note 50). However, he believes that ‘practically nobody’ agrees.

(1997: 19). Now I believe ‘language’ for Jackendoff is a generic term for all speakable languages (those in which we talk). Given THIS understanding of ‘language’, we can only sympathize with Jackendoff’s reaction. Perfection may indeed be an absurd concept in respect of ‘language’ so understood and there is more than enough in Chomsky’s own writings to suggest he himself would think so. But IS this in fact how Chomsky now understands/intends ‘language’? On the one hand, his continued commitment to the DIP assumption (and ‘language as sound with a meaning’) would seem to justify interpreting CGG and Minimalism as being about ‘language’ in that generic sense – i.e. as being about (all) speakable languages. On the other hand, I believe Jackendoff’s comment - and the reaction of Jackendoff & Pinker (2005) to Hauser, Chomsky & Fitch (2002) – may be missing the target that Chomsky is in fact aiming at. In the sense of ‘language’ that really interests Chomsky, I suggest, the theory of language is the theory of the one human language - a natural singularity. Now, if that is what it concerns, it clearly does not concern any speakable/talkable language - since there is, inevitably, a plurality of speakable/talkable languages. The single, invariant, natural unspeakable/untalkable language cannot be other than LOT itself.

Chomsky (2002) includes the following arresting statement:

(Q5) Even the fact that there is more than one language is a kind of imperfection. (page 109)

This coheres well with my speculation regarding ‘perfect’ and that full perfection in FL (‘language’) would be achieved by its identification with a natural singularity, a generative computation describable as a ‘language of thought’. But, again, Q5 points up the instability. What kind of imperfection is this supposed to be? Is it ontological (‘substantive’) or methodological? Surely not ontological: if the world is such that it includes a plurality of languages (and it is), that’s the way the world is. Chomsky’s continued adherence to the double-interface assumption (and ‘language a sound with a meaning’) suggests the theory should be construed as a theory of (all) particular languages (with their phonologies). And, if that’s the object of enquiry, its plurality is conceptually necessary, or at least inevitable - for it is precisely the non-natural conventionality of ‘sound with a meaning’ that makes for the plurality/diversity of particular languages. Could it be, then, that the imperfection is methodological, in fact lying IN A THEORETICAL PROGRAM for ‘language’ that’s unstable as to what it is a theory of - a natural singularity or a *de facto* plurality?

That’s one construal of the ‘imperfection’ constituted by the plurality of particular languages. An alternative construal is this. If by ‘language’ (‘FL’) we in fact intend the one human language describable as a ‘language of thought’, the imperfection lies in a theory of language that is left undecided what to do with - what to make of - particular languages. How do they fit into the picture, on that interpretation of ‘language’? More specifically, what is the relation between that natural singularity and the plurality of particular languages? What we require is an account of the RELATION between FL/LOT and the plurality of particular languages that would allow us to make a more radical DISTINCTION between them than is generally made in CGG.¹⁸

¹⁸ The canonical CGG account of the relation is instantiational: particular languages are instantiating states of FL. See note 16 above. However, Chomsky himself did once suggest, and I agree, that there is a ‘crucial inadequacy’ in this idea (1995: 6-7). Elucidating, he comments ‘it is hard to imagine that the

Coda

As mentioned, the proposal that syntax should be grounded exclusively in semantics - is the generative syntax of conceptual structure - and thus that FL and LOT should be identified, demands a story on phonology. What principled grounds - independent of any desire to equate FL and LOT - can be offered for excluding phonology from the generative computation? We need a story on where and what phonology is and how exactly phonology RELATES TO the one human generative computation (FL/LOT). Equally, we need a story - consistent with (and perhaps identical to) the story on phonology - about particular languages and how they relate to that single computation. This is what the Representational Hypothesis (RH) sets out to provide.

Although it informs the thoughts outlined above, the RH is not the focus of this paper. (I have anyway outlined some of its ideas elsewhere and I don't want to turn this into another advertisement for it.) Nevertheless, I must point up here one major respect in which the RH differs from the double-interface assumption. It concerns 'externalization'.

Chomsky (2006 and elsewhere) refers repeatedly to 'externalization'. The evolutionary picture that emerges from Q2 plus Q4, for example, is that the internal system ('a "language of thought"') underwent an internal modification - 'adapt[ing] to the sensorimotor apparatus' and thereby developing into a double-interface system by the incorporation of a phonological component - specifically to allow for 'externalization' of the objects it generates. 'Externalization' here seems to mean: manifestation in - by conversion into - some mind-external form produced by human motor systems and perceived by human sensory systems (sound, gesture, or whatever), if only for the purposes of communication.¹⁹ This reflects the widely held assumption - shared by Chomsky (see e.g. 2006: 8, 9, 14) - that objects generated by the mind-internal computation can be 'pronounced'.

The RH, by contrast, holds that anything properly describable as 'a "language of thought" - and thus anything generated by it - is, by definition, radically internal. By 'radically internal' I mean, not just not-internalized (acquired/learned), but also, emphatically, not externalized or externalizable (not pronounceable). Relevant mind-external phenomena, on this view, are not 'externalizations' of the radically mind-internal system; for the RH, their relevance to the mind-internal system consists in their standing - by convention and intention - in an asymmetric relation of (symbolic) REPRESENTATION TO the radically mind-internal objects it generates.²⁰ The relation of

properties of the language faculty - a real object of the natural world - are instantiated in any observed system' (1995: 11, Note 6).

¹⁹ Chomsky (1995: 221): 'If humans could communicate by telepathy, there would be no need for a phonological component - at least for the purposes of communication'.

²⁰ For the RH, 'MEANING' resides in, indeed is constituted by, that representational relation. The idea here is that meaning is to be thought of as a RELATION, not a PROPERTY - and hence not a semantic property. More specifically, what generally passes for 'the meaning of x (for someone s)' actually resides in a (semiotic) relation of x TO the constitutive semantic (CI) properties of an object generated by LOT. Semantic properties (whatever they may be) reside in and only in LOT. On these terms, while meaning crucially involves semantics (it being a relation to semantics), 'meaning' and 'semantics' are distinct.

Now, if x is an uttered sound, this reconstructs 'sound with a meaning' without appeal to anything having both phonological and semantic properties, the DIP assumption. This is why the RH holds that the DIP assumption is not conceptually necessary to the modeling of sound with a meaning. This was the argument of my (2007) and is presented at greater length in BR (in prep).

representation calls for no ‘conversion’ of anything into anything else - and thus no conversion of the mind-internal into the mind-external (or vice-versa).

An individual’s acquired particular language is now thought of as a system that provides for such representation - i.e. a system for the representation, in some mind-external medium (typically acoustic), of radically mind-internal conceptual structures generated by LOT. Phonology (including morphology) is central here. Each particular acquired language, *l*, has a phonological system that plays an essential role in establishing *l*’s representational system - to the extent, at the very least, of determining what counts, in *l*, as a well-formed (representational) phonetic form. Given this representational rationale, phonology is located in and only in the representational systems we call particular languages (‘I-languages’, if you like), not in the radically internal system (LOT) that is the unique *representatum* of those representational systems.

As regards evolution, the picture presented by the RH is that, once in place, LOT underwent no phylogenetic modification. It remained radically internal, in the sense that it did not – and, given the representational idea, can’t be thought of as needing to – ‘adapt to the sensorimotor apparatus’. If anything needed to adapt, it was the sensorimotor apparatus itself – adapting to the representational function. However, assuming it was already in place, and in a form anyway sufficient for that function, the sensorimotor apparatus did not need to adapt but was merely harnessed to the new function.

The relevant modification in human cognition, then, was external to LOT. It consisted in the evolution of a - separate, though of course dependent - capacity for the conventional (i.e. symbolic) representation, in mind-external media, of radically internal conceptual structures generated by LOT. And I suggest that, in this respect, ontogeny recapitulates phylogeny (see Note 16 above).

Chomsky (2006: 10) refers to a ‘great leap forward’ in human evolution. I speculate that the great leap forward consisted in, or was only made possible by, the evolution of a capacity for SYMBOLIC REPRESENTATION (arguably not found anywhere else in nature). What this capacity (and thus your particular language) endows you with is a further, more conscious, kind of access to your thoughts - and thus a certain form of thinking (and communication) - denied to species lacking that capacity.

In assigning a representational role to phonology (with respect to the generative computation), the RH suggests simultaneously **(a)** that phonology is not a component of the generative computation itself and is thus not an imperfection in it and **(b)** that, being essentially involved in the most striking (the prime) example of the human symbolic representational capacity (i.e. particular languages), phonology is not ‘ancillary’ - but absolutely central - to specifically human cognition. More generally, wherever phonology is, it surely must be central there. This, to me, is a more palatable stance with regard to phonology than one that situates phonology within a computational system that would, by hypothesis, be ‘perfect’ were it not for the putative inclusion of phonology.²¹

²¹ A representational approach to phonology offers a plausible criterion of perfection in phonology: a phonological system is perfect to the extent that it makes available fully PERSPICUOUS (phonetic) representations of conceptual structures. On those terms, phonological systems are generally far from perfect - perhaps inevitably. They allow for ambiguity, for example. Burton-Roberts & Poole (2006) can be read, in effect, as a consideration of certain respects in which phonetic representations in Icelandic and English, for example, are less than fully perspicuous – and of why, despite that, they are good enough.

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