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Lingua

Lingua xxx (2009) xxx–xxx

[www.elsevier.com/locate/lingua](http://www.elsevier.com/locate/lingua)

## Book review

**How syntax naturalizes semantics, A review of *Syntactic Anchors: On Semantic Structuring*, Juan Uriagereka. Cambridge University Press, Cambridge, (2008). ISBN: 978-0-521-86532-6, xxiii+340 pages, USD 130 (hardback)**

Juan Uriagereka's *Syntactic Anchors* finally got published in 2008, but a large portion of it was already written and circulated as early as 2004, and it arguably has fostered a number of works that crystallized into what Chomsky (2007:15) calls a novel approach to the 'naturalization of meaning'. This article will first briefly summarize some of Uriagereka's relevant proposals in section 1, and then discuss a number of important consequences of this approach. Section 2 will argue that his approach naturally fits with the *methodological naturalism* of Chomsky (1995a), and it is an attempt to render semantics a genuine naturalistic/biological science to the extent that syntax already is. Section 3 will then point out that it invites us to rethink what we now call the *strong minimalist thesis* (SMT). Section 4 will conclude the article.

### 1. Co-linearizing syntax and semantics

The minimalist program for (bio)linguistic theory (MP) is a research enterprise that posits as the leading hypothesis the *strong minimalist thesis* (SMT), a conjecture that human language is perfect in some nontrivial sense (Chomsky, 2000a, 2007). The SMT is intended to serve not only as a heuristic Ockham's razor guideline toward the elimination of redundancies in theory-formation, but also as the exposition of the enterprise's ontological commitment to simplicity in language as a matter of biological reality. The quest for simplicity concerns various linguistic subdomains (syntax, semantics, phonology) and their interfaces in general.

One of the important minimalist questions is, then, how transparent and straightforward the interface between syntax and semantics is. *Syntactic Anchors* is devoted to defending one of the strongest possible minimalist hypotheses regarding this question. Uriagereka names his hypothesis the *co-linearity thesis* (CLT), which posits that syntax and semantics are so narrowly and transparently correlated that the mapping between them should be trivial. In his words, semantic interpretations are 'co-linear' with syntactic derivations. The idea of syntax–semantics co-linearity has rather an old tradition, espoused in many approaches to semantics, but what is new in Uriagereka's CLT is the idea that it is syntax that assumes the primary role in determining the characteristics of syntax–semantics mapping. Specifically, Uriagereka argues that his CLT can be put in two ways, either radically or conservatively (see, e.g., p. 224).

- (1) ***The radical/eliminative CLT:***  
Syntax and its derivation dynamically *construct* semantics.
- (2) ***The conservative CLT:***  
Semantics is made to *correspond*, in as natural a fashion as viable, to the articulated structures that syntax and its derivation yields.

These two formulations of the CLT differ in the extent to which they reduce semantics to syntax: the former eliminates it completely, while the latter at least allows it to exist as a co-linear reflection of syntax. Either way, the core claim shared by them is that it is syntax that carves the path that semantics must blindly follow (Uriagereka, 1999:275/2002:64; Hinzen, 2006:250; Chomsky, 2007:15).

Specifically taking the emerging cyclic Spell-Out/Transfer model (see Uriagereka, 1999; Chomsky, 2000a, 2004) at face value, Uriagereka presents as a concrete implementation of the CLT the *distributed interpretation thesis* (DIT), which claims that semantics is ‘opportunistic’, and takes all sorts of instructions from syntax as the derivation unfolds (p. xvi). The core claim can be summarized as follows (cf. p. xviii, p. 2, p. 255):

(3) ***The distributed interpretation thesis (DIT):***

Derivations of  $n^{\text{th}}$  order syntax dynamically correspond to interpretations of  $n^{\text{th}}$  order semantics.

According to the DIT, semantics does not wait for syntax to finish the derivation, but rather immediately starts interpreting any stable objects of some syntactic complexity by means of interpretations with corresponding semantic complexity.

Uriagereka claims that the generative systems of human syntax are naturally classifiable into three orders of computational complexity, corresponding to the *Chomsky Hierarchy* appropriately updated in terms of strong generative capacity: finite-state, context-free, and (mildly) context-sensitive systems (see chapter 7), and that this hierarchy naturally provides three classes of syntax–semantics interface due to the DIT.

Finite-state syntax, characterizable in terms of finite-state automata with no systematic memory, has a very limited expressive power. It is only capable of (i) generating unstructured (labelless) sets, (ii) capturing adjacency relations between two elements, (iii) iterating an identical element via looping (see chapter 6, section 8.2.1). Simplifying somewhat, Uriagereka essentially proposes that these three trivial finite-state structurings correspond to an equally trivial semantics (his *Trivial Structure (TS) Hypothesis*; see sections 3.5.2, 6.4.3). First of all, any syntactic derivation starts with an unstructured (finite-state) set of lexical items ((i)), which is called a *Numeration* and defines a set of elements to be interpreted at the C–I interface (the Condition of Full Interpretation; see pp. 232–233, p. 267). Second, the adjacency between any two syntactic objects designated by means of binary Merge (without labeling of the context-free or context-sensitive sort) ((ii)) is uniformly interpreted as signaling semantic equation of these two elements. The identificational small clause constitutes a typical instantiation of such trivial identificational semantics (e.g., *I (won’t) declare [Dr. Jekyll Mr. Hyde]/[Mr. Hyde Dr. Jekyll]*), and Uriagereka further claims in chapter 3 that another such case is syntactic incorporation of an element carrying an event variable  $e$  into an element carrying another  $e'$  that results in yet another trivial adjunction structure<sup>1</sup> yielding identification of these two sub-event variables (cf. Higginbotham’s, 2000 theta-identification; see chapter 2). He further claims that creating copies of an identical element involves precisely this kind of finite-state looping, plainly accounting for why copies of one category are routinely interpreted as identical. Third, he provides various instances of iterative processes in human language that further uniformly correspond to semantic emphasis or focus across languages and constructions ((iii); see chapter 6). The reason why this correspondence holds at all is, according to Uriagereka, that associating elements in a properly finite-state syntax (looping, resulting in iteration) precludes any higher order syntax from operating on them and invoking corresponding higher order semantic effects (such as presupposition, a prototypical context-sensitive interpretation for him) (see Herburger’s, 2000 neo-Davidsonian treatment of focus semantics and Uriagereka’s CLT-based implementation of it in section 8.3.2; see also Irurtzun, 2007 for a different implementation).

Next, Uriagereka argues that external Merge is a quintessential context-free process, given that it requires no derivational search, but still is able to generate labelled hierarchical phrases. The DIT then predicts that this context-free process should be matched with a corresponding distinct semantic component of comparable complexity. Uriagereka claims that this must be the *D-structure component*, which is responsible for interpretations of the  $\theta$ -theoretic/predicate–argument structure sort. See chapter 1 for a detailed argument that human language faculty must assume such a *component*, although it cannot be a distinct *level of representation* as traditionally assumed in the Extended Standard Theory. In this way, Uriagereka attributes the correlation of external Merge and ‘D-structural’/conceptual semantics to the DIT.

<sup>1</sup> To conceive of adjunction as a trivial syntax, readers are referred to Uriagereka and Pietroski’s (2002) observation that adjuncts do not (and cannot) involve any interesting transformational syntax: they are not selected, do not move to check features, do not get bound or bind, do not surface as empty categories, do not control and are not controlled, and are not capable of moving beyond the weakest of islands. See further Boeckx (2008a), Hornstein and Nunes (2008) and Hornstein (2009:chapter 4) for the view that adjunction essentially is Merge without labeling.

The higher-order ‘surface semantics’, involving scope, presupposition, context-confinement and others of the pragmatic-intentional sort, is also naturally tied to the higher distinct syntax of comparable context-sensitive complexity, as demanded by the DIT. Such context-sensitive syntax would presumably include derivational search and manipulations of previously established syntactic relations, basically the topic of transformational syntax. Internal Merge and Agree, on which the former is assumed to be parasitic,<sup>2</sup> are such instances, accounting for their close correlation with various logico-intentional semantics. See, e.g., chapter 4 for how context-sensitive Agree(ment) with respect to person-features relates to the ‘point-of-view’ semantics sensitive to pragmatic speaker-addressee context confinement. Moreover, what he calls *reprojection* (Hornstein and Uriagereka, 1999, 2002) is claimed to be another instance of a context-sensitive syntactic operation, since it ‘overwrites’ previously established labels (see section 8.3; see also Irurtzun, 2007; Narita, 2008). He claims that this process is responsible for not only scope-taking of strong quantifiers (the primary topic of Hornstein and Uriagereka) but also various other ‘dimensional shifts’ of paradigmatic dependencies in, e.g., *Aktionstart deductions* (see chapters 7 and 8 and references cited therein).

Uriagereka’s overall proposal, in short, is that various semantic interpretations arise essentially as a result of syntactic derivations of comparable computational complexity. The resulting DIT is a coherent theory that substantiates the validity of the overarching CLT.

## 2. Biologizing meaning

The picture resulting from the radical or conservative CLT is, in a certain sense, a kind of ‘inverse generative semantics’. Uriagereka is ready to agree with generative semanticists that semantic complexity correlates with syntactic complexity, but rather than eliminating syntax (a mind-internal form-to-form mapping procedure) in favor of semantics (a syntax-external intentional system), which generative semanticists tried and failed to do, he seeks to reduce most of the explanatory burden of semantics to syntax (see, e.g., p. 307).

Some might regard Uriagereka’s ‘syntactocentrism’ as a mere arbitrary decision (just as arbitrary as generative semantics). However, his project should rather be seen as a serious endeavor to make linguistic meaning as real a natural object as syntax, as I claim in this section.

Human individuals are endowed with an ability to recursively and hierarchically manipulate linguistic representations that can be assigned to corresponding sentences. This is simply an undeniable fact, as anybody can readily conclude through introspection regarding numerous facts about structural ambiguity and the limitless possibility of embedding a sentence into a larger one. This generative ability should include, at least as one of its components, *Merge*, a recursively applicable operation that combines a finite number of linguistic forms and creates a larger form that it can further operate on. Whether this recursive form-to-form mapping system in question consists of more than just Merge (including, say, Agree) or can be optimally reduced to the former, whether it is distributed over many different subcomponents with their own idiosyncratic rules and constraints (as assumed in, e.g., the (Extended) Standard Theory and also some version of model theory; see below) or is confined to a single component with cyclic outputs (Uriagereka, 1999; Chomsky, 2000a, 2008) how many interfaces it has with the neighboring performance systems, and what the exact nature of such interface boundaries is, are all open empirical questions, which biolinguists naturally debate in various ways. However, no matter how these issues are to be ultimately settled, the biological existence of this very generative capacity in the human mind/brain is beyond any doubt. This generative ability, which makes infinite use of Merge (and possibly other kinds of form-to-form mapping operations) to generate linguistic forms in its humanly unique way, then, is a *bona fide* natural object that we can naturalistically study as such, within the proper domain of the natural sciences. This natural object is appropriately called *syntax*.

Thus, as long as we are studying syntax, we are pursuing a natural science. This enterprise fits properly under the rubric of *methodological naturalism*, the position that studies, and seeks theoretical understanding of, human language and mind with the same rationale and methodology as are adopted to investigate other natural objects (Chomsky, 1995a).

It is another obvious fact that syntactic forms (sometimes associated with overt sounds or signs, though not necessarily) can be used by an individual, ‘appropriately’ and ‘meaningfully’ with regard to whatever purposes s/he might use them for. Such an observation leads the participants of the above-mentioned naturalistic inquiry to more or

<sup>2</sup> Although see Chomsky (2008), Boeckx (2008b) and many others for an emerging view that internal Merge is as free as external Merge.

less *passively* postulate the ‘thought’/C–I system as a sum of performance mechanisms that syntax can interface with. In doing so, naturalists may expect that this enterprise, when developed, can eventually clarify something about the nature of this interfacing hypothetical construct. But such an expectation is in principle secondary to the naturalistic study of the forms and workings of syntax, since syntax can anyway generate forms regardless of whether and how ‘meaningful’ they are at such interface(s). Whether the theory can eventually meet such expectation will only depend on empirical progress and prospects that the study of syntax will yield in due course.

It is not a naturalistic decision to start the relevant inquiry by *presupposing* that semantic interpretation of syntactic forms at the C–I interface is denotational, referential or truth-conditional, as is, nevertheless, customarily done by many researchers, especially those committed to model-theoretic semantics. Presupposing such a guiding principle prior to relevant empirical investigations is a form of *methodological dualism* (Chomsky, 1995a), to be avoided in naturalistic inquiries. For one thing, human individuals don’t exhibit factual intuitions on ‘denotation’, ‘reference’ and ‘truth-condition/truth-value’, since these terms are stipulated technical notions, arbitrarily defined in a way that is rather orthogonal to the naturalistic inquiry into human language, perhaps due to heavy influence by logical positivism and the representational theory of mind in modern philosophy. Moreover, the hypothesis is empirically flawed. Uriagereka makes the following estimation:

“[W]hen it comes to . . . ‘reference’-bearing elements, or more generally elements with a denotation (*John*, *book*, *sing*, and the like) not a single theory exists that clarifies what sort of relation takes place between such words and what they denote. This may seem too harsh a comment to make, but the truth is all familiar theories—all of them, really—*presuppose* the relation, in statements of the sort of ‘*snow*’ *refers to snow*. Indeed, contemporary semantics prides itself in being able to operate without detailed knowledge of that intentional dependency, solely on the basis of the algebraic combinations that work above those relations, which are deemed either irrelevant—where the theory bottoms out—or something that psychologists ought to work out the details of. But the details themselves are not forthcoming.” (p. 9)

And unless such details are supplied, the assumption that linguistic expressions ‘denote’ things outside the head or some other stipulated abstract entities fails to be an honest naturalistic hypothesis. Presupposing that *a priori* is a methodological dualist take.

Surely, language can be used by a person to describe things outside the head, or to judge correspondence to the world knowledge he has, a common-sense fact that the concept of ‘denotation’ borrows heavily from. But these are things that a person does, not what linguistic expressions do. Language use is a form of free action, carried out by a person for any number of purposes he might have in his intention. And “general issues of intentionality, including those of language use, cannot reasonably be assumed to fall within naturalistic inquiry.” (Chomsky, 1995a:27).

Note that model theory is in principle isolable from the denotational/referential/truth-conditional conception of meaning, though quite often coupled with it. Moreover, it is true that model theory is currently one of the accepted tools available for capturing aspects of entailment. Chomsky has recently hinted at the possibility that one might regard model theory as a component of syntax in a broad sense. If one makes that further assumption, then the model-theoretic computation on (narrowly) syntactic forms becomes part of this natural object by assumption, although the output cannot be denotations of the truth-reference sort anyway, if one wants the theory to be naturalistic. Then, the resulting patchworked theory, consisting of (at least) two very different components (one narrowly syntactic and the other model-theoretic), should be subjected to the usual minimalist scrutiny, and thus the advocates of such a view must bear a serious burden of empirical demonstration, which further should be met without recourse to dualist denotational arguments (see also McGilvray, 1998, 2009; Chomsky, 1995a, 2000b; Hinzen, 2006).

In contrast, what the CLT suggests is a radically different picture of the syntax–semantics interface, namely that interpretation is transparently carved out by syntax, with which it is co-linear, and benefits from the fact that syntax is an established natural object.

It is not the case that Uriagereka’s DIT-based theory is the only possible implementation of the CLT. For example, Pietroski’s (2005 and references cited therein) *neo-Davidsonian conjunctivist semantics* is another promising framework. Simplifying somewhat, it claims that symmetric Merge ( $\{X, Y\} = \{Y, X\}$ ) directly corresponds to the symmetric ‘and’ operator in neo-Davidsonian interpretations ( $(\exists e: X(e) \& Y(e) = (\exists e:)Y(e) \& X(e))$ ), a proposal that is clearly congenial to the CLT. For conjunctivists, the compositional ‘predicate’–‘argument’ asymmetry is to be co-

linearized by some asymmetry-creating syntactic operation (other than the symmetrical Merge) in conformity with the CLT, for which various proposals have been put forward:  $\theta$ -feature checking (Hornstein, 2002 and references cited therein), labeling (Irurtzun, 2007; Boeckx, 2008a; Hornstein, 2009), Agree with respect to edge-features (Narita, in press), and Transfer (Boeckx, in press-a).

All these alternatives are to be contested empirically, but the prospect is that the CLT is arguably a simpler (more minimalist) theory of syntax–semantics interface than the one that model theory would envisage, as Uriagereka and others claim, granted that it arguably awaits further empirical substantiation. Besides, more importantly, the CLT is an honestly naturalistic hypothesis, indeed a serious attempt to save the whole semantic enterprise from the fear of it ending up as a dualist fiction, providing room for a naturalistic science of linguistic meanings. Accordingly, semantics is biologized, or becomes as real a natural object as syntax already is, by means of the CLT.

### 3. Rethinking the SMT

At this point, it is instructive to review what the CLT implies for the leading hypothesis of the MP, namely the SMT. The first formulation of the SMT by Chomsky (2000a:96) is given in (4), which I would like to call the *functional SMT*:

- (4) *The functional SMT*:  
Language is an optimal solution to legibility conditions.

It says that syntax satisfies interface legibility in an optimal way, whatever the relevant notion ‘optimality’ ultimately turns out to be. Correspondingly, the concept of *principled explanation*, the desideratum of maximally substantiating the SMT, is formulated, under this version of SMT, as an attribution of various properties of language to either the third factor<sup>3</sup> or legibility conditions (see, e.g., Chomsky, 2008:134). The primacy of C–I over SM in the optimization of syntax is commonly assumed (Chomsky, 2008).

Note that this version of the SMT regards syntax essentially as a *function* of legibility conditions, defined independently by the neighboring performance systems. Hence the term functional SMT.

While the functional SMT surely had the effect of making clear the fundamental relevance of notions like optimality and simplicity to biolinguistic minimalism, and fostered many subsequent works that speak to optimality and economy in language in various ways, it was unfortunate that this thesis was regarded by a certain number of researchers as a go-ahead for a *functional/teleological account* of human syntax. Essentially underlying the functional SMT is the idea that syntax and its various properties arise as a best available adaptive compromise between the lexicon and the conditions imposed by the performance systems. Thus, although not a large number of researchers nowadays espouse vague functionalist notions like ‘efficiency for communicative success’ at the heart of their accounts, it is still rather customary in this field to postulate some constraints at the (still syntax-internal) interfaces to performance systems and let them explain particular attested syntactic patternings. Thus, for example, Richards (2007, 2008) starts his account with the assumption that the C–I-interface categorically resists unvalued features. He claims that by assumption, then, syntax must fulfill the need to delete all the unvalued features introduced by the lexicon, an efficient satisfaction of which functionally derives many computational tricks within syntax, such as feature-inheritance, derivational simultaneity, specific patternings of merger of phase-heads and non-phase-heads (see also Chomsky, 2007). Another dominant instance of a functional account of syntax is a version of the Kaynean (1994) *Linear Correspondence Axiom* (LCA) (suggested by Chomsky’s, 1995b modified LCA and followed by many, including Uriagereka),<sup>4</sup> which assumes that the need of linearization by SM-performance systems imposes a condition that strictly configures syntactic computation in such a way that

<sup>3</sup> The third factor of language design is a set of computational principles and organizational constraints that are not specific to human language and enter into an explanatory theory of human language along with the first factor (genetic endowment specific to language) and the second factor (experience in a given environment). See Chomsky (2005).

<sup>4</sup> However, Kayne’s original conception of the LCA was that it is not a filter at interfaces but a derivational constraint on syntax.

asymmetric c-command relations within the forms it generates can be mapped to precedence in a one-to-one fashion.

In this line of approach, as a consequence, the explanatory role of syntax in biolinguistic theory is reduced to a certain extent, and the burden of explanation is shifted largely to the neighboring performance systems that allegedly impose various legibility conditions upon it. Such a functional/teleological take is surely one possible way to go, and may well be suitable for certain cases. Notice, however, that the ultimate explanation for *why* the very legibility to these performance systems appeared in this particular way but not many other imaginable ways is largely left as a mystery in our biolinguistic investigations, even though different sets of legibility conditions are equally imaginable: thus, Richards' account does not address *why* unvalued features require deletion (contra Pesetsky and Torrego's, 2007 equally conceivable suggestion that valuedness and interpretability are two different notions), nor *why* the deletion must happen specifically *via* Agree (but not, say, by Spec-head agreement); nor does the modified LCA ask *why* asymmetric c-command is crucial for linearization but not, say label-domination (as suggested by Fukui and Takano, 1998). Neither do answers to these *why*-questions seem forthcoming, as long as the leading hypothesis is the functional SMT, which defines legibility conditions as predefined axioms of the theory of human language.

I would like to point out that one of the important consequences of Uriagereka's CLT is that *the MP can be freed from the confinement of the functional SMT*.<sup>5</sup> Taking issue with the syntax–semantics relation, Uriagereka proposes that rather than presupposing that semantics and its legibility conditions strongly configure syntax, we should see the relation the other way round. Namely, it is syntax (its evolution, development, and computation) that dynamically configures the shape of interfacing semantics. This is essentially his CLT, which he argues can be interpreted in two ways, either radically or conservatively (see (1) and (2) above).<sup>6</sup> Either way, the view put forward here is that semantics does not constrain syntax, but is just passively co-linear with the latter. Thus, to the extent that we can substantiate the CLT, we depart from the functional/teleological conception of the SMT.

As pointed out by Chomsky (2007:15), then, “SMT and the concept of principled explanation would be correspondingly simplified,” since the burden of explanation is largely shifted from interface legibility to the third factor. If so, biolinguists would like to refine the SMT in (4) by eliminating the notion of legibility *conditions* in its formulation, for interface legibility is, under this view, no longer a set of primitive axioms to derive syntax, but is rather recast as a *theorem* to be at least partially derived by the axioms of syntax (in relation to the performance systems). The result would be something like (5):

(5) ***The simplified SMT:***

Language is optimal in terms of the third factor.

‘Optimality’ in the simplified SMT is to be defined not by some independently postulated interface conditions, but by the third factor in the design of syntax, including computational efficiency. Rather, “*whatever the interfaces happen to be*, the minimalist issue is accessing them in an optimal way.” (p. 8) The simplified version of principled explanation also only speaks to the third factor. The simplified SMT unambiguously invites the biolinguistic enterprise to investigate the third factor, even with the hope that we might start to *explain*, by way of ‘syntactic anchors’, *why* the interfacing systems work as they do (rather than starting by *presupposing* some hypothesis as to how they work). This is, certainly, a serious naturalistic endeavor which leads toward the eventual unification with core sciences (Chomsky, 1995a, 2000b).

Chomsky (2007:15) is right in pointing out that “the satisfaction of [legibility conditions] cannot be entirely eliminated [from biolinguistic theory],” given that the performance systems “must have some range of resources that can exploit the properties of generated expressions, along with whatever is involved in use of language to reason, refer, seek to communicate perspicuously, and other mental acts.” To properly acknowledge this still doesn't imply that these resources of performance systems must crucially enter into biolinguistic explanation in such a way (as in the

<sup>5</sup> Even Uriagereka might not agree with me in drawing this conclusion, given that he still assumes a functional account of PHON-linearization in terms of the LCA along the lines of Uriagereka (1999).

<sup>6</sup> A similar idea is explored in Hinzen (2006, 2007), another strong advocate of the radical CLT. One of the important differences between these two different implementations of the CLT is that Uriagereka more readily allows vague context-sensitive semantico-pragmatic effects to be assigned to indeterminate syntax of comparable computational complexity. See, e.g., p. 143, fn. 43.

functional SMT) that they define axiomatic conditions functionally constraining the generative capacity of syntactic computation.

That said, the nature of the third factor that enters into the SMT is admittedly quite ill-understood at this early stage of biolinguistic inquiry. But there are already some proposals. For example, it is likely that the principle of *economy of derivation* (Chomsky, 1995b:138–145; Fukui, 1996) will come to play a significant role in the SMT. It requires that syntax chooses the least costly derivation to reach the interfaces, where the cost of derivation is determined solely by some syntax-internal metric. It is nowadays customary to trivialize such global economy considerations by restricting the search domain locally (Collins, 1997; Chomsky, 2000a, 2008). Such a move is claimed to have some empirical support, which might be the case, but even so it is still also conceivable that these types of localization are rather instances of heuristic ‘computational tricks’ (Chomsky, 1995b:162; Fukui, 1996) that syntax is designed to come to exercise (probably taking various cues from the second factor) for overcoming the demand of this global economy principle. See Fukui (1996) for relevant discussion. However, the notion of *convergence*, originally defined as a function of (non)crashing at interfaces (Chomsky, 1995b:219–220), should be either dropped or appropriately revamped in the definition of such economy principles, for syntax is not ‘crash-proof’ (Frampton and Gutmann, 2002), either as a matter of hypothesis (Chomsky, 2004:112; Ott, 2009; Boeckx, in press-b) or as a matter of fact (Chomsky, 1955); it just generates expressions of various degrees of deviance.

Recall further Uriagereka’s claim that the Chomsky Hierarchy figures in any computational system so naturally that it “can be understood as a primitive for the purposes of the SMT.” (p. xvii). Here I take him to be claiming that the Chomsky Hierarchy is subsumed under the third factor. He also makes a claim, following Hinzen and Uriagereka (2006), that syntax (as well as semantics) has formal structural bases akin to number theory and topology, hinting the possibility of comparative study of these human-unique capacities. Quite relevant to this future research is Kuroda’s discovery (in press) that there exists a formal procedure for transforming the Euler product representations of certain  $\zeta$ -functions (a fundamental concept in number theory) into phrase-structure representations, an intriguing result which should be readily translated into the Merge-based generative system, as pointed out by Fukui (forthcoming).

The inquiry into the third factor is definitely a difficult task, and moreover it is not clear where the simplified SMT leads us to, nor whether it is even the right thesis to contrast with the functional SMT. No success is guaranteed, but this is usually the case with any naturalistic inquiry. Indeed, “we can do no more than seek “best theories”, with no independent standard for evaluation apart from contribution to understanding, and hope for unification but with no advance doctrine about how, or whether, it can be achieved.” (Chomsky, 1995a:7).

#### 4. Conclusion

The chapters of *Syntactic Anchors* present various attempts to substantiate the CLT by means of the DIT. Admittedly, most of Uriagereka’s proposals await much finer empirical revision and substantiation. The DIT itself might well turn out to be misguided, but this book should be nevertheless credited for its clear exposition of the overarching CLT. I rather read it as an invitation to a purely naturalistic enterprise that seeks deeper explanation for *both syntax and semantics* in terms of the three factors of language design, with the significance of the third factor emphasized.

The overall project is, indeed, a novel approach to the ‘naturalization’ of meaning (Chomsky, 2007:15). The project ‘simplifies’ semantics as a co-linear reflection of syntax. Consequently, it also ‘biologizes’ semantics, rendering it as real a ‘natural’ object, hence worthy of theorizing in terms of naturalistic sciences, as syntax already is. Finally, it provides a way to eventually relate both syntax and its co-linear semantics to the overarching computational simplicity that physics claims is a fundamental property of ‘nature’. The overall research program, if even remotely on the right track, would make the eventual unification with other core sciences not too remote a goal from the prospects of biolinguistic inquiry anymore.

#### Acknowledgements

I am indebted to Cedric Boeckx, Koji Fujita, Naoki Fukui, Peter Jenks, Terje Lohndal, Masumi Matsumoto, James McGilvray, Bridget Samuels and Juan Uriagereka for their various comments and suggestions. All remaining errors are solely mine.

## References

- Boeckx, C., 2008a. *Bare Syntax*. Oxford University Press, Oxford.
- Boeckx, C., 2008b. *Understanding Minimalist Syntax*. Blackwell, Oxford.
- Boeckx, C. On the locus of asymmetry in UG. A special issue of the *Journal of Catalan Linguistics*. Fortuny, J., Gallego, Á (Eds.), in press-a.
- Boeckx, C. A tale of two minimalisms: Reflections on the plausibility of crash-proof syntax, and its free-merge alternative. In: Putnam, M. (Ed.), *Derivational Simplicity in Minimalist syntax*. John Benjamins, Amsterdam, in press-b.
- Chomsky, N., 1955. *The Logical Structure of Linguistic Theory*. ms. Harvard University (Published in part in 1975, New York: Plenum).
- Chomsky, N., 1995a. Language and nature. *Mind* 104, 1–61.
- Chomsky, N., 1995b. *The Minimalist Program*. MIT Press, Cambridge, MA.
- Chomsky, N., 2000a. Minimalist inquiries: the framework. In: Martin, R., Michaels, D., Uriagereka, J. (Eds.), *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*. MIT Press, Cambridge, MA, pp. 89–155.
- Chomsky, N., 2000b. *New Horizons in the Study of Language and Mind*. Cambridge University Press, Cambridge.
- Chomsky, N., 2004. Beyond explanatory adequacy. In: Belletti, A. (Ed.), *Structures and Beyond: The Cartography of Syntactic Structures*, vol. 3. Oxford University Press, New York, pp. 104–131.
- Chomsky, N., 2005. Three factors in the language design. *Linguistic Inquiry* 36, 1–22.
- Chomsky, N., 2007. Approaching UG from below. In: Sauerland, U., Gärtner, H.-M. (Eds.), *Interfaces + Recursion = Language? Chomsky's Minimalism and the View from Semantics*. Mouton de Gruyter.
- Chomsky, N., 2008. On phases. In: Freidin, R., Otero, C., Zubizarreta, M.L. (Eds.), *Foundational Issues in Linguistic Theory*. MIT Press, Cambridge, MA, pp. 133–166.
- Collins, C., 1997. *Local Economy*. MIT Press, Cambridge, MA.
- Frampton, J., Gutmann, S., 2002. Crash-proof syntax. In: Epstein, S.D., Daniel Seely, T. (Eds.), *Derivation and Explanation in the Minimalist Program*. Blackwell, Oxford, pp. 90–105.
- Fukui, N., 1996. On the nature of economy in language. *Cognitive Studies (Bulletin of the Japanese Cognitive Science Society)* 3, 51–71 Reprinted in Fukui (2006).
- Fukui, N., 2006. *Theoretical Comparative Syntax: Studies in Macroparameters*. Routledge, Dordrecht.
- Fukui, N. Merge and bare phrase structure. In: Boeckx, C. (Ed.), *The Oxford Handbook of Linguistic Minimalism*. Oxford University Press, Oxford, forthcoming.
- Fukui, N., Takano, Y., 1998. Symmetry in syntax: Merge and Demerge. *Journal of East Asian Linguistics* 7, 27–86 Reprinted in Fukui (2006).
- Herburger, E., 2000. *What Counts: Focus and Quantification*. MIT Press, Cambridge, MA.
- Higginbotham, J., 2000. Accomplishments. In: *Proceedings of GLOW in Asia II*. Nanzan University, Nagoya, Japan, pp. 72–82.
- Hinzen, W., 2006. *Mind Design and Minimal Syntax*. Oxford University Press, Oxford.
- Hinzen, W., 2007. *An Essay on Names and Truth*. Oxford University Press, Oxford.
- Hinzen, W., Uriagereka, J., 2006. On the metaphysics of linguistics. *Erkenntnis* 65, 71–96.
- Hornstein, N., 2002. A grammatical argument for a neo-Davidsonian semantics. In: Preyer, G., Peter, G. (Eds.), *Logical Form and Language*. Oxford University Press, Oxford, pp. 345–364.
- Hornstein, N., 2009. *A Theory of Syntax: Minimal Operations and Universal Grammar*. Cambridge University Press, Cambridge.
- Hornstein, N., Nunes, J., 2008. Adjunction, labeling, and bare phrase structure. *Biolinguistics* 2 (1), 57–86.
- Hornstein, N., Uriagereka, J., 1999. Labels and projections: a note on the syntax of quantifiers. In: *University of Maryland Working Papers in Linguistics* 8. pp. 249–270.
- Hornstein, N., Uriagereka, J., 2002. Reprojections. In: Epstein, S.D., Daniel Seely, T. (Eds.), *Derivation and Explanation in the Minimalist Program*. Blackwell, Oxford, pp. 106–132.
- Irrutzun, A., 2007. *The grammar of focus at the interfaces*. Ph.D. Dissertation. The University of the Basque Country.
- Kayne, Richard S., 1994. *The Antisymmetry of Syntax*. MIT Press, Cambridge, MA.
- Kuroda, S.-Y. Suugaku to seiseibunpoo: “setumeiteki datoosei-no kanatani” sosite gengo-no suugakuteki jituzairon [Mathematics and generative grammar: “beyond explanatory adequacy” and mathematical realism of language] (with an extended English summary). *Sophia Linguistica*, Sophia University, Tokyo, Japan, in press.
- McGilvray, J., 1998. Meanings are syntactically individuated and found in the head. *Mind and Language* 13, 225–280.
- McGilvray, J., 2009. Introduction to the third edition. Noam Chomsky (2009). *Cartesian Linguistics: A Chapter in the History of Rationalist Thought*, Third Edition. Cambridge University Press, Cambridge, pp. 1–52.
- Narita, H., 2008. Two ways of pronouncing “unpronounceable” QR. In: Otsu, Y. (Ed.), *Proceedings of TCP2008*. Hituzi Syobo, Tokyo, pp. 151–175.
- Narita, H. Full interpretation of optimal labeling. *Biolinguistics*, in press.
- Ott, D., 2009. The conceptual necessity of phases: some remarks on the minimalist enterprise. In: Grohmann, K.K. (Ed.), *Explorations of Phase Theory: Interpretation at the Interfaces*. Mouton de Gruyter.
- Pesetsky, D., Torrego, E., 2007. The syntax of valuation and the interpretability of features. In: Karimi, S., Samiiian, V., Wilkins, W. (Eds.), *Phrasal and Clausal Architecture: Syntactic Derivation and Interpretation in Honor of Joseph E. Emonds*. John Benjamins, Amsterdam, pp. 262–294.
- Pietroski, P.M., 2005. *Events and Semantic Architecture*. Oxford University Press, Oxford.
- Richards, M.D., 2007. On feature inheritance: an argument from the phase impenetrability condition. *Linguistic Inquiry* 38, 563–572.
- Richards, M.D., 2008. Two kinds of variation in a minimalist system. In: Heck, F., Müller, G., Trommer, J. (Eds.), *Varieties of Competition*. Universität Leipzig, pp. 133–162.
- Uriagereka, J., 1999. Multiple Spell-Out. In: Epstein, S.D., Hornstein, N. (Eds.), *Working Minimalism*. MIT Press, Cambridge, MA, pp. 251–282.

Uriagereka, J., 2002. *Derivations: Exploring the Dynamics of Syntax*. Routledge, London.  
Uriagereka, J., Pietroski, P., 2002. Dimensions of natural language. In: Uriagereka, pp. 266–287.

Hiroki Narita  
*Harvard University, Department of Linguistics, Boylston Hall,  
third floor, Cambridge, MA 02138, United States*  
*E-mail address:* [narita@fas.harvard.edu](mailto:narita@fas.harvard.edu)

16 March 2009