

Bridget D. Samuels: *Phonological architecture: a biolinguistic perspective*. Oxford: Oxford University Press 2011, 252 s.

The aim of Bridget D. Samuels' ambitious book, published in the series *Oxford Studies in Biolinguistics*, is to sketch a theory of phonological competence that is consistent with recent Minimalist thinking in syntax in postulating a simple but powerful computational core supplemented by extraphonological considerations ranging from the contingencies of acquisition and diachrony to a well-elaborated theory of the phonology-morphosyntax interface. She succeeds admirably in presenting a case for phonology as a component of the human linguistic capacity that lacks significant architectural differences vis-à-vis other cognitive abilities involved in language (for contrasting views of phonology in this respect, cf. Bromberger & Halle 1989, Burton-Roberts 2000).

The book is written so as to appeal both to phonologists and to specialists in other disciplines, notably syntax and the evolution of language, and its confident, engaging style succeeds in presenting complex and interesting arguments. Samuels' insistence on methodological minimalism leads her to embrace a "substance-free" approach to phonology (see also Hale & Reiss 2000, 2008, Morén 2007, Blaho 2008, Odden 2010, 2013) that puts considerations such as the physical realization of phonological units and ease of production and perception outside the remit of the phonological grammar (contrast e.g. Browman & Goldstein 1990, Hayes, Steriade & Kirchner 2004, Boersma 2009).

As discussed by Blaho (2008, §1.2), the label "substance-free" has come to cover a variety of approaches, ranging from the framework of Hale & Reiss (2008), with a trivial phonetics-phonology interface and involving a rule-based computation, to versions of Optimality Theory involving complex representations with no fixed phonetic realization (e.g. Morén 2006, 2007, Blaho 2008, Krämer 2009, Youssef 2010). Samuels' approach tends towards the Hale & Reiss end of this continuum, but the book is also replete with original, thought-provoking proposals in numerous areas of phonological theory.

Following a brief introductory chapter, Chapter 2 ("A Minimalist program for phonology") provides the theoretical context for the book, including the basics of Minimalist and biolinguistic thinking, an application of this framework to phonology (in particular with respect to the question of what phonological theory should explain), a discussion (and rejection) of the notion of markedness as an explanatory factor in phonology, and a review of the basics of Evolutionary Phonology (Blevins 2004). Chapter 3 ("Phonology in evolutionary perspective") provides a wide-ranging comparison of the human cognitive abilities that are involved in the production, perception and acquisition of sound patterns

to the cognitive abilities of other animals, arguing that most of the human “phonological” capabilities are in fact mirrored in the animal kingdom, and therefore that the evolutionary distance between non-human “phonology-like” abilities and human phonology is relatively small. Chapter 4 (“The syntax-phonology interface”) presents a novel theory of interaction between phonology and morphosyntax, called Phonological Derivation by Phase, which seeks to integrate Distributed Morphology and the hypothesis of phase-based spell-out in order to replace the multiple levels of Lexical Phonology (and cognate theories) and the prosodic hierarchy. Chapter 5 (“Representations and primitive operations”) focuses on the core computational operations of “phonology proper”. These are the three primitive operations SEARCH (establishing a coindexing relationship between two elements of a representation), COPY (ensuring uniformity in some phonological aspect between coindexed elements under certain conditions), and DELETE (removing an element from the representation), and the manipulation of precedence relations. The examples here come mostly from harmony and templatic morphology. The chapter also contains an extended argument against syllabic constituency in phonology. Chapter 6 (“Linguistic variation”) discusses a number of topics related to accounting for differences in phonological grammars in Samuels’ version of substance-free phonology, with particular attention to the nature of phonological features, phonological acquisition and diachronic influence on synchronic patterns. Chapter 7 provides a brief conclusion and some avenues for future research.

Samuels synthesizes a particularly broad range of literature in fields as diverse as phonology, syntax, and the evolution of language to present an original and coherent view of phonological architecture, and a brief review cannot do full justice to all the arguments discussed in this book.

One particular consequence of the programmatic nature of the book, however, is the inevitable feeling that the analysis of actual patterns often feels more like a proof of concept than a fully fledged account. Here I limit myself to only a few observations, concentrating on the phonological side of the proposals.

A major desideratum for Samuels’ model of phonology is the absence of any constituent structure: she presents sustained arguments against the prosodic hierarchy (chapter 4), the syllable (chapter 5) and feature geometry (also chapter 5).<sup>1</sup> Although the proposals are interesting, the book’s emphasis on breadth over depth means that Samuels does not always have the space to make an entirely convincing argument.

For instance, Samuels tries to derive the distinction between the stem and word levels of Lexical Phonology exclusively from morphosyntactic domain structure; in this, she relies largely on the proposals by Marantz (1997), without at all engaging with the criticisms (including phonological ones) that these proposals have faced (see Bermúdez-Otero 2012 for some discussion and refer-

ences). Samuels also contends that the cycle can subsume all phenomena that are normally explained with reference to prosodic structure, although it has been argued that it is possible to distinguish between cyclic and prosodic effects on principled empirical grounds (Bermúdez-Otero & Luís 2009, Bermúdez-Otero 2011).

In some respects Samuels' quest to simplify the phonological component by finding extraphonological explanations for morphology-phonology interactions seems to amount to a return to pre-LP days, as in her admission of morpheme-specific rule diacritics such as [-rule X], in gross violation of modularity. Samuels' discussion of this particular argument provides a good example of how the constraints of space interfere with in-depth argumentation. The empirical support for morpheme-specific phonology comes from Irish consonant mutation. Samuels notes that homophonous possessive clitics trigger different alternations in the following noun ([kat] 'cat', [əxat] 'his cat', [əgat] 'their cat') and concludes (p. 92) that "it is hard to imagine how this effect could be captured, if not by rules specific to the individual possessive pronouns. (Establishing three separate allomorphs of every noun in the language... seems a far less parsimonious option.)" Even setting aside the rather curt dismissal of work that presents empirical arguments for this latter solution (Stewart 2004, Green 2006 and, with a different but not unrelated take, Hannahs 2013), Samuels appears to completely ignore the mainstream approach to Celtic mutations in generative phonology, which sees them as triggered by floating features stored as part of the mutation trigger (Hamp 1951, Lieber 1987, Swingle 1993, Wolf 2007, Iosad to appear).

A similar incompleteness haunts Samuels' proposal to do away with syllable structure. Samuels claims (p. 141) that the syllable "is never strictly necessary", but her discussion focuses almost exclusively on the role of the syllables in phonotactics (here, she relies heavily on work such as that by Côté 2000 that derives phonotactics from sequential restrictions) and on speaker judgements, and does not really engage with data that seem to involve the syllable in "core" phonological phenomena such as alternations. As a consequence, some of the sweeping claims ring somewhat hollow: thus, claims that the number of syllables, unlike syllable boundaries, is easy to report ("we can still distinguish polysyllables from monosyllabic words", p. 136) and that there is no recursion at the syllabic level ("no syllabic or subsyllabic node can dominate a node of the same type", p. 121) are challenged by data from Scottish Gaelic (see Davis et al. 2011 for syllable count judgements and Smith 1999 for syllable-node recursion), while Samuels' contention that syllable counts are an artefact of counting sonority peaks (p. 128) takes no account of cases presented by Hall (2006), where the number of sonority peaks does not match the prosodic structure enforced by phonological computation (e.g. for the purposes of word minimality).

There are times when her specific phonological proposals appear to clash with what Samuels sees to be desirable architectural properties. For instance, her rejection of syllable structure leads her to accept the proposals by Côté (2000) to admit sonority into the structural descriptions of phonological rules, such as “a rule which deletes a consonant word-finally provided its sonority is greater than that of the segment preceding it”. This apparently requires treating sonority as a phonological entity (e.g. as a multivalued [Sonority] feature, cf. de Lacy 2006), even as Samuels seems to imply that “sonority sequencing” (p. 133) and the “sonority hierarchy” (footnote 11, p. 135) do not fall into the remit of phonology.

Similarly, while Samuels presents her theory as being “substance-free”, some of the argumentation would appear to be incompatible with how this label is sometimes seen in the literature. Again in the discussion of the syllable (p. 140), Samuels expresses a doubt that “appeals to syllable structure in phonological rules are somehow explanatorily deep [rather than] bring[ing] into service the principles of perception, production, cognitive organization, and whatever else may be relevant”. If this argument is taken seriously, then it applies to the entirety of the substance-free phonological enterprise. As emphasized by Odden (2013), a phonological computation that takes no regard of substance is restricted to constraining possible manipulations of phonological symbols. The sort of “deep” explanation that Samuels is looking for is almost always going to be extraphonological. Phonologically, the correct question to ask — one that Samuels does engage with, of course, albeit perhaps incompletely — is “Does introducing syllables improve our understanding of what phonological processes are (im)possible?” In other words, the existence of extraphonological explanations for many phenomena traditionally associated with the syllable does in no way preclude the existence of syllables in the phonological grammar proper.

Samuels also devotes very little space to subsegmental representations, assuming a phonetically-based featural structure with binary features. This can also lead to frustratingly incomplete arguments: for instance, the rejection of feature geometry in the book hinges on a single example of a violation of the Line Crossing Constraint in Sibe where [-high] spreads across instances of [+high]. One is immediately compelled to ask whether an analysis in a privative theory could be available, but this is not followed up at all. Samuels does give a rationale for her decision to use universal features (p. 186): although features are in principle substance-free, the human (or more generally mammalian) auditory apparatus is independently better attuned to certain acoustic properties of the signal, so that those properties will tend to recur for linguistic use.<sup>2</sup> Nevertheless, Samuels does not really consider the linguistic evidence for or against a non-trivial (learned) mapping between phonology and substance. Of course,

if this mapping is universal (though perhaps emergently rather than innately so), then the task of the analyst (and perhaps the learner) is considerably simplified. Still, the proposals in chapter 5 could be considerably strengthened if they did not rely to such an extent on representations that are silently assumed rather than explicitly argued for.

The volume of the criticisms made above only underscores the thought-provoking value of Samuels' book. Her very readable presentation of bold, far-reaching proposals will hopefully serve to energize the architectural debate in phonology, and its reaffirmation of the value of formal computation (in its substance-free guise) makes it an important contribution at a time when an improved understanding of empirical aspects of phonological data puts many old orthodoxies to the test. In addition, the book is pitched not only to phonologists but also to specialists in other disciplines, including those outside linguistics,<sup>3</sup> serving to tie some current linguistic debates into the wider context of cognitive science. It thus serves as a valuable, relevant contribution to linguistic theory and to cognitive science in general.

## Notes

1. Samuels does accept metrical feet, but treats them in terms of bracketed grids, not suprasyllabic constituent structures (e.g. Halle & Vergnaud 1987, Idsardi 1992, Fabb & Halle 2008).
2. Samuels cites a study of ferrets to confirm this point, but see Kingston et al. (2008), Kirby (2010) for discussion of related issues with reference to human phonology.
3. The book even includes a glossary, although some of the entries perhaps serve more to confuse than to enlighten (e.g. the definition of markedness as “[a]n abstract measure of how unusual a particular linguistic structure is”).

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