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Reviews


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If one topic of discussion in linguistics has been of importance throughout the past 60 years, it would undoubtedly be innateness: to what extent is the knowledge of language we all have innate?* From the current literature (e.g. Tomasello 2014, Everaert et al. 2015), it is not immediately clear that the intervening decades have led to a consensus on the topic: the range of possible opinions among the scholarly community seems to be almost as vast as it was in the 1950s.

Phonology plays an interesting role in this debate, as, of the four central grammatical systems (semantics, syntax and morphology being the other three) it seems *a priori* the one which is least likely to be specifically innate – as it seems to be the most directly connected to the outside world. Even Chomsky, the scholar universally recognised as the key promotor of nativism and ‘Universal Grammar’, seems to sometimes suggest in interviews that phonology is ‘different’: ‘it is very complex; it does not seem to have any of the nice computational properties of the rest of the system’ (Chomsky 2012: 40).

According to Chomsky’s minimalist programme, ‘the faculty of language in the narrow sense’ only involves some operations, such as Merge and maybe Agree and Label; he sees these as specific to syntax.

Iris Berent’s book *The phonological mind* offers a clear and convincing dissenting voice in this debate, arguing forcefully on the basis of interesting arguments for a moderately nativist position in phonology, one which incorporates a great deal of insight acquired in the course of years by her and her collaborators, which seems entirely reasonable to me and which is clearly minimalist in its own right; while not denying that the specific phonologies of individual languages are shaped by many kinds of factors, including phonetic ones, she identifies a minimum of phonological knowledge that seems to be innate.

More specifically, the central claim of this book is the following: phonology is an algebraic core knowledge system.

This definition subsumes two subclaims. First, one important aspect of phonological cognition is that it is algebraic, i.e. phonology is a computational system that is based on discrete categories, which can be seen as equivalence classes: all the members of a natural class are treated as equivalent, regardless of whether they are familiar or novel. These categories may correspond in some (sometimes rather complex) way to the continuous scales that seem to

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make up phonetic reality, but that reality does in itself not explain that speakers treat sound systems as consisting of discrete units. It is as if human phonological cognition lays a discrete grid over this reality. As Berent points out, there is no logical necessity for this; a language in which every ‘word’ or ‘morpheme’ corresponds to some specific concrete sound event separate from all other sound events (i.e. in which there are neither features nor syllables) is perfectly conceivable, but it is not found. Moreover, languages in other modalities, e.g. sign languages, impose an algebraic grid on continuous reality. It can only be our knowledge system that is responsible for this grid; and phonology is the name of that knowledge system.

Secondly, according to Berent, phonology is not just the application of some more general purpose algebraic capacity to sounds (or the units of sign language), but it rather is a core knowledge system in the sense of Spelke & Kinzler (2007): a specialised module of human mental activity. According to Berent (§3.2), such a hypothesis is an ‘intermediate position’ between ‘a radical nativist’ and an ‘extreme empiricist’ explanation. It assumes that the human mind has a dedicated cognitive ‘module’ which is responsible for the computation of phonological form, but not that all aspects of the phonologies of individual languages, or even all phonological universals, are due to the workings of this module: such properties and universals can also be due to the nature of the phonetic substance that forms the domain of phonology.

It is not Berent’s goal to put forward specific proposals about what is and is not part of the core knowledge system which she sets up, beyond the basic idea of ‘algebraic phonology’. The notion of a distinctive feature is crucial to her proposal, for instance, but no specific feature set is argued for, nor is there a strong claim about the general shape of such features (are they binary or monovalent?; what is their precise phonetic content, if any?; etc.). Furthermore, Berent refers at several points to optimality-theoretic analyses of phonological phenomena, but it remains unclear whether or not OT can be seen as part of the phonological core knowledge system, or whether it is just a convenient way of describing it. It is clearly not the aim of this book to propose a fully articulated theory of phonology; rather, it is to define a kind of lingua franca in which theoretical and experimental phonologists can talk to each other: a set of propositions that can be tested empirically, and which also has a sound theoretical foundation.

I find Berent’s proposal thought-provoking and inspiring, and her style of argumentation exemplary, in that she combines clear, logical and abstract thinking about how to model reality with a good sense of how to test empirical predictions in a laboratory. In my view, the approach presented in The phonological mind is how phonology should be done: neither pure armchair-theoretical reasoning (often based on the linguist’s own intuitions or on fieldwork notes of not always very reliable quality) nor pure theory-free experimentation will lead us very far. It is the kind of phonology that does not need to call itself ‘laboratory’, because it takes for granted that certain claims can and should be tested in an experimental environment. This does not mean that I think that Berent is necessarily right in every claim she makes, let alone that she has said the final word about the nativeness debate, but I think the structure of her argumentation is noteworthy and important.
The book consists of four parts. After an introduction in which the main claim is laid out and the background of the debates are explained, Part II explores the notion of algebraic phonology, and Part III that of phonology as a core knowledge system. Part IV discusses several interesting extensions of the main idea, for instance to language acquisition and to (alphabetic) reading and writing. The style is very accessible: Berent is a psychologist, and does not presuppose a lot of technical phonological background; nevertheless, the book is also an interesting read for the specialist.

Berent has previously written on most of the topics dealt with here – sometimes in collaboration with colleagues – but the book has all the advantages of a longer publication: it shows how the various experiments which have been conducted over the years lead to a coherent picture of the ‘phonological mind’. For instance, Part II, on algebraic phonology, discusses work done by Berent and her group, as well as by others, on syllables and the distinction between consonants and vowels, clearly showing how we can say that human beings consider each of these sets to be equivalence classes, and how this is already true for very young children: in some experiments children show knowledge of the relevant classes even before they start learning individual words (for example, Berent cites the work of Nespor et al. 2003 on infants’ apparent understanding of the consonant/vowel ratio in their native language).

There is an interesting discussion about learning the templatic patterns of Modern Hebrew roots, which disallows triconsonantal roots of the shape \( C_1C_1C_2 \) (i.e. where the first two consonants are identical), but does allow \( C_1C_2C_2 \) roots. Berent demonstrates how Hebrew speakers even generalise this restriction to nonsense words in which one of the consonants is \( /\theta/ \), a consonant that does not occur in Hebrew. The fact that speakers took longer to recognise that, say, \( /k\theta\theta/ \) is a non-root in a word-recognition task than to do the same for \( /\theta\theta k/ \) can be seen as evidence not just that the speakers know about these templates, but that they also automatically put the non-Hebrew sound \( /\theta/ \) in the right equivalence class of consonants. This kind of generalisation is exactly what the algebraic phonology hypothesis predicts (even if it remains to be established how exactly Hebrew speakers in this case come to classify \( /\theta/ \) as a consonant).

Part III, on phonological universals and the idea of the core knowledge system, centres around sonority restrictions on syllable structure. The interest of this notion is on the one hand that it seems to have its roots in phonetic considerations, and on the other that phonotactics clearly is the object of study a great deal of phonological theory. One problem with theorising in this way, however, is that it is very often based on traditional typology, which in turn is based on what linguists have observed in actual words in actual languages. But those actual words have obviously been shaped by many factors apart from an individual speaker’s knowledge, e.g. the forces at work in historical change. Berent therefore reports experiments with artificial stimuli consisting of made-up ‘words’ (or even entire ‘languages’), showing that English speakers are more likely to hear a sequence such as \( lbif \) as bisyllabic (with an epenthetic schwa between \( l \) and \( b \)) than \( bdif \) (with a sonority plateau), which in turn is more likely to be heard as bisyllabic than \( bnif \) (with rising sonority, but with a cluster which does not occur in English for independent reasons). The crucial point here is that \( lb, bd \) and \( bn \) are all equally impossible word onsets in English, so
the fact that speakers treat them differently can only be the result of their identifying certain equivalence classes which corresponds to points on the sonority scale in theoretical phonology. (It is unlikely that this occurred because of the presence of the acoustic correlate of a schwa, because the same results were obtained with synthetic and with printed materials.)

Part IV shows how the algebraic core knowledge system could also be used in our understanding of literacy, and also compares human phonology with the sound systems used by other animals and with music, showing how they are different, and discusses the possible physiological correlates of the mental phonological capacity.

In all, *The phonological mind* presents a great deal of interesting experimental data about human phonological cognition, and manages to put them together in a coherent and fairly simple theoretical framework which is compatible with much of what we know from other sources (such as work on more traditional typological data), and which can be tested and refined against many other types of data. The book sets out a programme for future research as much as presenting existing work.

There are also some problems which should be kept in mind. The first is that any kind of innateness evidence is almost by necessity negative: we have to assume that some kind of knowledge is innate, because we are unable to say how it could have arisen out of the experience of an average speaker. I think that Berent’s cases, such as the Hebrew templates mentioned above, are rather strong – she really looks hard and seriously for alternative explanations, and finds none – but there is always the possibility that we might find an alternative explanation if we look hard enough (for instance, more refined kinds of analogical levelling than seem currently available, which could account for the Hebrew patterns).

Similarly, I think that the possibility that phonology is an instance of applying a general mechanism of algebraic reasoning in the domain of sounds or signs is also still open – so that phonology is not necessarily its own core knowledge system. The main problem which I can see for the latter assumption – no matter how sympathetic I am to it – is biological: why would the human species have developed such a system in the first place? And would this have happened at the same time as the development of the Chomskyan faculty of language in the narrow sense, or before, or after?

Finally, as indicated above, the theory presented here is very far from a complete view of the phonological core knowledge system. Apart from that fact that it makes no specific claims about phonological properties of OT, it also, for instance, leaves unspecified how the abstract algebraic phonological computation interacts with phonetic implementation. At some point, the algebraic classes need to be converted to and from messy articulatory movements and acoustic events; these tasks are presumably also done somewhere in the mind, but where?

Of course, the fact that such questions arise does not invalidate the programme outlined here. They are natural results, because I think it is indeed nothing less than a programme which Berent outlines; an interesting new proposal as to the status of phonology which builds on the current orthodoxy of both theoretical phonology and experimental psychology in such a way as to allow for a fruitful combination of the two disciplines. To summarise, I
think that no serious scholar who wants to contribute to the debate on the in-nateness of human language can ignore *The phonological mind*, if only to try to refute Berent’s claims and arguments. I also think that this book sets a new standard as to what good work in our field should be like. I highly recommend it to any phonologist.

REFERENCES


