

Windows with a view on language evolution*

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Accounts of the evolution of human language must, by their very nature, express claims of a historical sort: claims about why, when, where or how human language emerged and/or developed in some distant past. What is more, it is of the essence of those claims that they are put forward in the absence of direct evidence about the events and factors that may or may not have been involved in the evolution of language. In modern work on language evolution, however, scholars have come up with various strategies aimed at lessening or even solving this problem of evidential paucity. One of these approaches starts from the assumption that language evolution can be studied by examining other phenomena about which there is direct evidence. This article sets out, in informal terms, what it is to use such phenomena as windows on language evolution.

Introduction

In the past decade or two, there has been a rapid growth in the volume of work dealing with the evolution of language in our species. This is interesting in view of the absence of direct evidence about the events, biological processes, social forces, environmental pressures, and other factors that may or may not have been involved in the evolution of human language in a distant past. The lack of such direct evidence – that is, evidence derived from data contained in natural or man-made records of these events and other evolutionary phenomena – has generally been seen as one of the most forbidding obstacles to doing respectable work on language evolution. Language evolution is to be taken in the sense of ‘the first emergence and subsequent development of the human capacity for language and of the first ancestral language’.¹

The question, of course, is this: in modern work on language evolution, how have scholars gone about solving or ameliorating the problem of evidential

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paucity? That is: what are the approaches, strategies or means that have been adopted for investigating evolutionary events and phenomena about which there is no direct evidence? Of these approaches, the Windows Approach is arguably the one that is used the most widely. This approach assumes, in essence, that features of the evolution of language can be ‘seen’ by ‘looking at’ properties of other phenomena about which evidence of a direct sort does exist. These other phenomena are then taken to offer windows on the evolution of language. It has been claimed, for instance, that features of language evolution can be ‘seen’ by ‘looking at’ language evolution through the windows of other phenomena such as prehistoric stone tools, fossilized (fragments of) ancestral skulls, bird song, ‘language’ genes, motherese, homesigns created by deaf children of non-signing parents, pidgin languages – to mention just a few.

This article offers an informal account of what it involves to use the Windows Approach in investigating language evolution. It does so by discussing in outline three examples of individual windows – those offered by ‘degraded’ language, ‘language’ genes and motherese. And it explains what it is that determines how good an individual window on language evolution is and wherein the virtues of the Windows Approach as such lie.

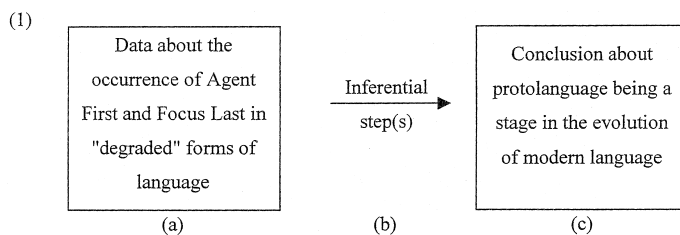
The ‘degraded’-language window

The American linguist Ray Jackendoff has claimed in two recent publications that the evolutionary emergence of modern language can be broken down into nine partially ordered steps or stages.^{2,3} In support of this claim, he furnishes evidence from what he considers to be a new source – so-called language fossils. ‘Language fossils’ are characterized by Jackendoff as traces of ancestral language that can be found in what he refers to as ‘degraded’ forms of modern language. The forms of language seen by Jackendoff as ‘degraded’ include pidgin languages,⁴ homesigns invented by deaf children of non-signing parents,⁵ the language of people suffering from agrammatic aphasia,⁶ and the Basic Variety (BV).⁷ These ‘degraded’ forms of language exhibit, in Jackendoff’s view, traces of the stage in the emergence of language referred to as ‘protolanguage’ – a stage at which language is characterized by short strings or ‘handfuls’ of words without any formal structure.⁸

Jackendoff cites two examples of the traces of protolanguage that can be found in the ‘degraded’ forms of language listed above: the principles of Agent First and Focus Last. Under both principles, the linear order in which words or phrases occur is used towards the expression of meaning relations. The principle of Agent First roughly says that the word or phrase that refers to the agent (the ‘performer’) of an action (expressed by a verb) comes first in a string of words (or sentence). Organized in terms of this principle, the string of words *hit tree Fred* would mean

one thing only, namely ‘the tree hit Fred’, since *tree* comes first in relation to *Fred*. Focus Last, in turn, is a principle which roughly says that the word or phrase which expresses the focus of the information carried by a string of words (or sentence) comes last. For example, in the sentence *In the room sat a bear*, the phrase *a bear* takes up the final position for focal effect.

Returning to the central point: Jackendoff considers data indicating that ‘degraded’ forms of language use the word-order principles of Agent First and Focus Last as evidence for the conclusion that protolanguage was a stage in the evolution of language. Reconstructed schematically:



As used above, the concept of ‘a window on language evolution’ is clearly a metaphorical one. Schema (1) now makes clear that, in non-metaphorical terms, a window on language genesis is a device for making inferences about language evolution. To – metaphorically – ‘see’ a property of some aspect of language evolution by – metaphorically – ‘looking at’ a property of some other phenomenon is – non-metaphorically – to infer (something about) the property ‘seen’ from (something about) the property ‘looked at’. The phenomenon represented in box (a) of a schema such as (1) can be referred to as the ‘window phenomenon’ and the inferences that result from the use of such a schema, as ‘window inferences’.

Schema (1), moreover, makes it possible to identify clearly the features of a window on language evolution that determine how good it is. These ‘good-making’ features are features of the inferences which the window allows to be drawn. And among these ‘good-making’ features, the following three are basic:

- (2a) groundedness,
- (2b) warrantedness,
- (2c) pertinence.

So let us consider these features as they are manifested by the inferences allowed for by the ‘degraded’-language window.

Groundedness

As a feature of a window inference, groundedness reflects something about the starting point of the inference, represented by box (a) in schema (1). A window

inference is grounded to the extent that it proceeds from data about a window phenomenon whose properties are reasonably well understood. So as regards the ‘degraded’-language window, the question is: how well understood is the phenomenon of ‘degraded’ language from which Jackendoff draws his conclusions about stages in the emergence of language. Significantly, he does not address the following question:

(3) What is it that makes a form of language ‘degraded’?

But if there is no clear answer to question (3), then questions such as (4a)–(4c) cannot be given non-arbitrary answers.

(4a) How is it to be determined that the form of language X (or Y or Z) does or does not represent a ‘degraded’ form of language?

(4b) How is it to be determined that the linguistic phenomenon P (or Q or R) has the property of ‘degradedness’?

(4c) Must every property associated with every form of linguistic deficit or impairment be taken as a manifestation of ‘degradedness’?

If questions such as (3) and (4a) – (4c) cannot be answered in a clear and non-arbitrary way, then ‘degraded’ language represents a phenomenon that is poorly demarcated and, therefore, not well understood. This leaves an unwelcome possibility wide open: the possibility of simply stipulating that a particular form of language is a ‘degraded’ form of language. And so it is possible, in turn, to stipulate that a particular property is a manifestation of degradedness and that another one is not. But if it is possible to stipulate what is and what is not a ‘degraded’ form of language, it is possible likewise to stipulate what is and what is not a ‘language fossil’. And this makes it possible to stipulate further what is and what is not a stage in the emergence of language. But, of course, stipulating that some aspect of language evolution has or lacks a particular property is not the same as inferring that it has or lacks this property.

The inferences drawn from the phenomenon of ‘degraded’ language about the emergence of language, then, cannot be considered properly grounded. This conclusion signifies two things. On the negative side: it indicates that the ‘degraded’-language window on language evolution is, in a crucial way, less than well developed. On the positive side: the conclusion highlights a very important virtue of the Windows Approach to the study of language evolution. This approach, clearly, is heuristically virtuous in that it generates interesting questions about window phenomena, questions such as (3) and (4a)–(4c). These questions form a strong stimulus for investigating in depth the nature and properties of so-called degraded forms of language. An immediate aim of such work should be to construct a theory which gives a restrictive characterization of what ‘degraded’ language is. Such a characterization is needed as a basis for

discriminating in a non-arbitrary way between, on the one hand, ‘degraded’ forms of language and, on the other hand, forms of language that appear to be related but that are not ‘degraded’.

In sum: the Windows Approach to the study of language evolution requires a non-superficial understanding of properties of what are believed to be window phenomena. Adopting this approach, accordingly, encourages careful work on such phenomena. Specifically, looking at the evolution of language through relatively new windows – of which there is a whole range – demands that work on language evolution and work on the properties of window phenomena be done in tandem.

Warrantedness

Let us next consider the ‘good-making’ feature of warrantedness. This is a feature of the inferential step(s) represented by arrow (b) in schema (1). To see what the feature of warrantedness involves, we may note that question (5) arises about the inferential steps allowed for by windows on language evolution:

- (5) Why is it proper to infer properties of some aspect of language evolution from properties of some window phenomenon?

This question asks for a warrant or licence for the inferential step or steps allowed by a window. With respect to the ‘degraded’-language window, question (5) can be fleshed out as (6).

- (6) What is it that warrants the inference of stages in the emergence of language from properties of ‘degraded’ forms of language?

The warrant asked for in (6), obviously, cannot take the form of a bald stipulation to the effect that properties of ‘degraded’ forms of language indicate that certain stages occurred in the emergence of language. Instead, this warrant will have to take the form of an empirical theory, which gives a systematic account of how properties of ‘degraded’ forms of language and (properties of) stages in the emergence of language are interlinked. The empirical theory needed will serve as a bridge by which to move inferentially from the domain of ‘degraded’ language to the distinct domain of language evolution (Ref. 1, pp. 147, 203–204). In doing so, the needed theory will offer a basis for answers to questions such as (6) and (7a)–(7c).

- (7a) Why does the fact – if fact it is – that Agent First and Focus Last occur in some ‘degraded’ forms of language give these order principles their so-called evolutionarily primitive character, i.e. their ‘language fossil’ status?

- (7b) Would every feature of every ‘degraded’ form of language be evolutionarily primitive (and, thereby, reveal something about some stage in the emergence of language)?
- (7c) If the answer to (7b) is ‘no’, then what (kinds of) features of what ‘degraded’ forms of language would be evolutionarily primitive or ‘language fossils’?

Questions such as (6) and (7a)–(7c) point to a second way in which the ‘degraded’-language window is less than well developed. To construct a bridge theory that will be able to answer these questions, more empirical work on the properties of ‘degraded’ forms of language will clearly have to be done.

We see here a second aspect of the heuristic potential of the Windows Approach to the study of language evolution. For it is the adoption of this approach that gives rise to questions such as (6) and (7a)–(7c). Similar questions arise with respect to the inferential steps allowed for by other windows. As a matter of fact, all windows require bridge theories for warranting the inferences they allow. Unwarranted inferences are actually not inferences at all – they are stipulations. Or they represent imaginative speculations – to be underpinned at a later stage by warrants.

Pertinence

This brings us to pertinence – the third basic ‘good-making’ feature of window inferences. Pertinence – or the lack of it – is a property of what is inferred by using a window on language evolution. That is, pertinence is a feature of the conclusions represented by box (c) in schema (1). Roughly speaking, a conclusion is pertinent to the extent that it is about what may be called ‘the right thing’. Conclusions about stages in the emergence of language are clearly about ‘the right thing’: the evolution of language.

Which gives rise to the question: how could the conclusions of window inferences be about anything other than ‘the right thing’? How could such conclusions not be pertinent? Interestingly, quite a number of the conclusions allowed for by what are believed to be windows on language evolution are not about ‘the right thing’, as is illustrated by some inferences made possible by two relatively new windows.

The first is Tim Crow’s ‘language’ gene window.^{9,10} Looking at language genesis through this window, Crow infers that language evolved as a result of a genetic change that introduced a new principle of brain function. According to Crow, the genetic change in question occurred some 100,000 years ago and involved a critical change in a single gene for cerebral dominance on the Y chromosome of hominins. This change resulted in a shift in cerebral dominance

that caused *Homo sapiens* to speciate suddenly with a lateralized brain. In Crow's view, this shift allowed language to evolve as a species-specific mate recognition system.

Crow's scenario for the evolution of language – and specifically his account of the crucial genetic change – has been criticized on various counts. One of these criticisms – as articulated by Marian Annett – is of some interest to us.^{11,12} She argues on the basis of evidence about children with hemiplegic cerebral palsy that '[t]he gene [that was involved in the change postulated by Crow] is "for" speech, not language' (Ref. 12, pp. 1–2), and that "... CD [i.e. cerebral dominance] is not for high level language but for speech' (Ref. 12, p. 3).

What Annett argues is, in essence, that Crow's inference that language evolved as a result of a genetic change does not have the desired pertinence. That is, contrary to what Crow maintains, this inference is not about the evolution of language as a cognitive system that interrelates forms and meanings. It might be about the evolution of something else, of course. That is, assuming that this inference was grounded and warranted, it might be pertinent to the evolution of speech as one way of using language. In short: looking through the 'language'-gene window, as constructed by Crow, one cannot draw inferences that are directly pertinent to the evolution of language.

A similar problem seems to arise for Dean Falk's newly constructed motherese window.^{14, 15} She proposes what she refers to as the 'putting the baby down hypothesis'. Here, in Falk's own words, is what this hypothesis says:

The central thesis regarding motherese is that bipedal mothers had to put their babies down next to them periodically in order to go about their business [of foraging] and that prosodic vocalizations would have replaced cradling arms as a means for keeping the little ones content' (Ref. 14, p. 20 of draft).

These vocalizations – or so-called ancestral motherese – preceded in Falk's view what she refers to as 'the first glimmerings of speech in early hominims' and as 'the emergence of protospeech'. What is problematic is that she goes on to refer to these vocalizations as 'the evolutionary underpinnings that preceded the first glimmerings of language' and as 'the prelinguistic vocal substrates for protolanguage'. Significantly, in some contexts, Falk seems to draw a distinction between 'protospeech' and 'protolanguage' but in others she considers them to be one and the same thing. This gives rise to doubts about the pertinence of the inferences she draws from data about motherese. Given that they were grounded and warranted, these inferences might be pertinent to the evolution of modern speech. But they could not be directly pertinent to the evolution of modern language as well. It is possible, of course, that protospeech might offer a window on the evolution of protolanguage. But using this further window would require

one or more additional inferences which, in turn, would need to be grounded and warranted.

As far as pertinence is concerned, Falk's motherese inferences and Crow's 'language' gene inferences are problematic in the same way. What are generally taken to be two distinct linguistic entities – language and speech – are squashed together in the case of both sets of inferences. This brings us to a point that applies to all window inferences: such inferences can be pertinent – that is, about the evolution of language – only if they are underpinned by a restrictive theory of what language is. Such a theory will offer a basis for discriminating in a non-arbitrary way between language and linguistic entities that are distinct from language (Ref. 1, pp. 8, 41–44). These further entities will include, in addition to speech, other forms of linguistic behaviour, linguistic skills and so on.

A window with a view

Let us consider then, for one last time, the question of the virtue of individual windows on language evolution and of the Windows Approach in general.

As for the Windows Approach to the study of language evolution, its virtue lies in the fact that it is heuristically powerful in two general ways. First: it represents a means of making potentially interesting and respectable inferences about what language evolution involved. Second: it generates questions which are highly specific and the pursuit of which is likely to lead to a deeper understanding of a wide range of window phenomena.

As for individual windows, what makes them virtuous, we have seen, are the groundedness, warrantedness and pertinence of the inferences about language evolution which they allow. A window that makes it possible to draw inferences which have these three features may aptly be called a 'window with a view' – to give an unlicensed twist to the title of a famous E.M. Forster novel.

References and notes

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2. R. Jackendoff (1999) Possible stages in the evolution of the language capacity. *Trends in Cognitive Science*, **3**, 272–279.
3. R. Jackendoff (2002) *Foundations of Language: Brain, Meaning, Grammar, Evolution* (Oxford: Oxford University Press) p. 238.
4. Pidgin languages (or pidgins) are simple, marginal languages created by speakers of mutually unintelligible languages for the purpose of restricted communication. [See L. Todd (1990) *Pidgins and Creoles* (London: Routledge) pp. 1– 2.]
5. Homesigns are rudimentary systems of gestures created for the purpose of communication by deaf children who are not exposed to sign

- language until adolescence. [See S. Goldin-Meadow (2002) Getting a handle on language creation. In T. Givón and B. F. Malle (Eds) *The Evolution of Language out of Pre-language* (Amsterdam: John Benjamins Publishing Company) p. 344.]
6. Agrammatic aphasia is a language disorder caused by brain damage in adults. It is manifested in speech that is ‘telegrammatic’ in lacking function words – e.g. conjunctions, articles and auxiliary verbs – and inflectional affixes. [See D. Crystal (1987) *The Cambridge Encyclopaedia of Language* (Cambridge: Cambridge University Press) pp. 270–271.]
 7. The Basic Variety is the restricted variety of a second language that is learned by adults in a natural way, i.e. without instruction. [See W. Klein (2001) Elementary forms of linguistic organisation. In J. Trabant and S. Ward (Eds) *New Essays on the Origin of Language* (Berlin: Mouton de Gruyter) pp. 93–94.]
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 10. T. Crow (2002) ProtocadherinXY: A candidate for cerebral asymmetry and language. In A. Wray (Ed) *The Transition to Language* (Oxford: Oxford University Press) pp. 93–112.
 11. M. Annett (1998) Language, speech and cerebral dominance. *CPC*, **17**, 1118–1125.
 12. M. Annett (2000) No homo speciated on cerebral dominance. *Psychology*, **11**, No. 20 Language Sex Chromosomes (2).
 13. Cerebral palsy is a medical condition in which injury to the brain makes it impossible to control in the normal way some of the muscles in the body. In the case of hemiplegic cerebral palsy, only one side of the body is affected (www.virginia.edu/~smb4v/tutorials/cp/cp.htm).
 14. D. Falk (2003) Prelinguistic evolution in early hominins: Whence motherese? *Behavioral and Brain Sciences* (in press).
 15. Motherese – also called ‘caregiver speech’ and ‘baby talk’ – represents the form of speech used especially by mothers in talking to very young children. [See P. H. Matthews (1997) *Concise Dictionary of Linguistics* (Oxford: Oxford University Press) p. 234.]

About the Author

Rudolf Botha is Professor of General Linguistics at Stellenbosch University. He is the author of various books and papers on theoretical linguistics, conceptual foundations of linguistic theories and language evolution. This article is based on the text of a paper presented at a seminar with the theme “Windows on Language Genesis” that was held on 7–8 November 2003 at the Netherlands Institute for Advanced Study.

