LINGUISTIC DISCOVERY
DARTMOUTH COLLEGE

Volume 8
Issue 1
2010

Commentary on Hengeveld & van Lier - The Added Value of the Connectivity Hypothesis for the Map of Parts of Speech

Caterina Mauri

University of Pavia

doi: 10.1349/PS1.1537-0852.A.370

url: http://journals.dartmouth.edu/cgi-bin/WebObjects/Journals.woa/1/xmlpage/1/article/370

Linguistic Discovery
Published by the Dartmouth College Library

ISSN 1537-0852
linguistic-discovery.dartmouth.edu

The Added Value of the Connectivity Hypothesis for the Map of Parts of Speech

Comment on ‘An Implicational Map of Parts of Speech’ by Kees Hengeveld and Eva van Lier (2010)

Caterina Mauri
University of Pavia

Hengeveld and van Lier (2010) propose an interesting and convincing two-dimensional map for parts of speech (PoS), which is highly predictive and fruitfully integrates implicational hierarchies into a unified overall account that is in turn implicational in nature and provides a geometrical visualization of the respective hierarchical organization of the functions at play.

The authors label their model *implicational map* rather than semantic map because it deals with analytical primitives which are not semantic in nature, but rather belong to a different domain of grammar. However, their model “can be related in several ways to the general methodology of semantic maps” (Hengeveld and van Lier 2010: section 6), and they highlight three respects in which the implicational map of PoS can push the theory of semantic maps a step further: it shows (i) that the analytical primitives can consist of propositional functions, (ii) that semantic maps may have a high predictive power if they include a “hierarchy of hierarchies” like the one at issue, (iii) that, if semantic maps are implicational in nature, they can make predictions about the frequency with which specified constructions for the mapped functions are in fact attested across languages.

However, Hengeveld and van Lier do not consider a crucial ingredient of semantic map methodology, namely what Croft (2003:134) labels the Semantic Map Connectivity Hypothesis. As Croft and Poole (2008:4) argue, all possible semantic maps are constrained by the principle laid out in the Connectivity Hypothesis, according to which “any relevant language-specific and/or construction-specific category should map onto a *connected region* in conceptual space” (Croft 2003:134), or, in Haspelmath’s (2003: sec. 2) terms, “the functions must be arranged in such a way that all multifunctional grams can occupy a contiguous area on the map”.

The purpose of this brief comment is to point out that the two-dimensional implicational map proposed by Hengeveld and van Lier could be even more predictive if the Connectivity Hypothesis was taken into account, because this additional constraint would increase the accuracy of the model (i.e. fine-tunes whether it excludes categories which are not attested). This will in turn highlight the added value of construing the four propositional functions at issue as interconnected grams on a map, i.e. including in the analysis the implicational constraints pertaining to semantic maps[1] (such as the Connectivity Hypothesis), besides organizing the different implicational universals into a hierarchical net.

The authors formulate three implicational constraints that underlie the unified implicational map of PoS described in their paper (Hengeveld and van Lier 2010: sec. 4): (i) Predication $\subset$ Reference, (ii) Head $\subset$ Modifier, (iii) ((Predication/Reference) $\subset$ (Head/Modifier)). In their

[1] Following Haspelmath (2003), the term ‘semantic map’ is used in a broad sense here, so as to include maps dealing with analytical primitives which are not semantic in nature.

section 5, Hengeveld and van Lier argue that these three implicational universals predict 17 systems as possible, although only 13 are attested. Of the 4 predicted but unattested systems, two show multifunctional grams (Flex) that cover non-contiguous functions on the map. For convenience, the two systems are reproduced in Fig. 1 and Fig. 2 below (corresponding to Figures 23 and 24 in Hengeveld and van Lier 2010):

	head	*modifier*
predication	Verb	Flex
reference	Flex	–

Figure 1

	head	*modifier*
predication	Flex1	Flex2
reference	Flex2	Flex1

Figure 2

It is argued that these two PoS systems are possible because in both cases the three constraints (i)-(iii) governing the implicational map are not violated: (i) there is a flexible class of lexemes that can be used as the head of a referential phrase *and* a specialized or flexible class that can be used as the head of a predicative phrase, (ii) there is a flexible class of lexemes that can be used as modifier within a phrase *and* a flexible or specialized class of lexemes that can be used as the head of that phrase, (iii) in both cases there are distinct classes of lexemes for heads and modifiers within at least one phrase and distinct classes of lexemes for predicate and referential phrases. Yet, the two PoS systems in Fig.1 and Fig.2 *do* violate the Connectivity Hypothesis, in that the flexible classes included in the two systems occupy propositional functions which are not adjacent on the map.

The two authors acknowledge that “it would seem more probable to expect flexibility in cases where at least one parameter value [predication-reference or head-modifier, CM] is shared”, but they appear to regard this remark as a simple intuition, not as a constraint underlying their map. Their conclusion is therefore that “on the basis of [their] restrictions [see (i), (ii) and (iii) above], [they] are not able to exclude the systems in [Fig. 1] and [Fig. 2]” (Hengeveld and van Lier 2010: sec. 5, adapted). However, if flexible classes are to be treated as multifunctional grams by virtue of their ability to occur in more than one propositional function, they should be used in propositional functions which are contiguous on the map.

More specifically, the Connectivity Hypothesis possesses an inherent predictive potential, because it implies that if a multifunctional gram may express two functions which are distant on the map, this gram must also be able to express the functions in between. Therefore, a flexible class used both as modifier of a predicative phrase and as head of a referential phrase (cf. Fig. 1) should also be able to occur as modifier of a referential phrase (non-verb, cf. Fig. 9 in Hengeveld and van Lier 2010), or as head of a predicate phrase (cf. Fig. 22 in Hengeveld and van Lier 2010: it is one of the four possible but unattested systems). Likewise, a flexible class used both as the head of a predicative phrase and as the modifier of a referential phrase (cf. Fig. 2) should also be able to occur as modifier of a predicate phrase (but such a system would contradict the constraint in (i)), or as head of a referential phrase (such a system could only be possible if no class was available for the modifier function in a predicate phrase, cf. Fig. 21 in Hengeveld and van Lier 2010).

The Connectivity Hypothesis constraint is based on the similarity assumption underlying all semantic map models: the contiguity of different functions on a map is a consequence of their similarity, i.e. of their sharing some pertinent features. Multifunctional grams map onto contiguous functions by virtue of the fact that these functions share pertinent features, often as a consequence of diachronic processes in which a gram gradually acquires new similar (adjacent) functions. In the case in point, as the two authors remark, the pertinent features are the values of the two parameters of predication-reference and head-modifier, according to which the four basic parts of speech have been organized on a two-dimensional map. The systems in Fig. 1 and Fig. 2 are thus not attested because the flexible classes of lexemes they include would have to occur in propositional functions which do not share any pertinent feature (head of a referential phrase and modifier of a predicate phrase; head of a predicate phrase and modifier of a referential phrase).

To conclude, I think that the three initial constraints in (i), (ii) and (iii) could be integrated with a fourth constraint (iv) stating that a flexible class may only occur in propositional functions which are contiguous on the map, in accordance with the Connectivity Hypothesis. The intersection of these four constraints would lead to the exclusion of systems such as the ones represented in Fig. 1 and Fig. 2, thus increasing the predictive potential and the accuracy of the model.

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Author's contact information:
Caterina Mauri
Dipartimento di Linguistica Teorica e Applicata
Università degli Studi di Pavia
Strada Nuova 65
27100 Pavia, Italy
caterina.mauri@unipv.it