

# LINGUISTIC ARGUMENTS PROBABLY ANTEDATE LINGUISTIC PREDICATES<sup>†</sup>

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The received view is that the first distinct word types were noun and verb (Heine & Kuteva, 2002; Hurford, 2003a). Heine and Kuteva (2007) have suggested that the first words were noun-like entities. The present paper submits ten new arguments that support this claim. The arguments are novel implications of the reviewed evidence which is made to bear on the evolution of the linguistic predicate/argument (e.g. noun/verb) structure. The paper concludes that the evidence for noun-like entities antedating other word types is overwhelming.

## 1. Introduction<sup>1</sup>

It is generally agreed that argument and predicate are the syntactic (or propositional) functions of N and V, respectively (Anward, 2001; Helmbrecht, 2001). As pointed out by Hurford (2003b), the N/V structure does not align with the predicate/argument structure of FOPL (and SOPL). The conflict between the two above sentences implies a discrepancy between the predicate/argument structures of NL and FOPL/SOPL. In Luuk (2009a,b), I have characterized the predicate/argument system of NL as distinct from that of FOPL and SOPL (and possibly also of higher-order logics) in a number of respects. A property of this system is that nouns are linguistic arguments and verbs are linguistic predicates but the set of linguistic arguments and predicates is not restricted to nouns and verbs.

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<sup>1</sup> **Abbreviations:** ADJ adjective, ADP adposition, AUX auxiliary verb, DET determiner, FOPL first order predicate logic, LA linguistic argument, LP linguistic predicate, LP/A linguistic predicate/argument, N noun, N/V noun/verb, NL natural language, NP noun phrase, POSS possessive, SOPL second order predicate logic, TAM tense-aspect-mood, V verb

As suggested by Heine and Kuteva (2007, see also 2002), the first word type in language evolution was most likely a noun-like entity. The noun-like entities were not nouns in the modern sense, complete with grammatical marking and syntactic function (the latter is already precluded by the circumstance that the first words belonged to protolanguage which lacks syntax by definition – Bickerton, 1990; Jackendoff, 1999), but words which stood for time-stable, referential units expressing primarily thing-like concepts. As Heine and Kuteva (2007) define the first word type semantically (or denotationally), they can bypass the interdependence condition, characteristic of arguments and predicates in modern language. As syntactic functions, argument and predicate are interdependent, but their semantic motivation exhibits not interdependence but complementarity, opening the possibility that argumental entities appeared before predicative ones. Below is a meta-analysis contributing ten new arguments to the case for the evolutionary primacy of LA over LP. Heine and Kuteva's (2007) original arguments were the possibility of verbless pidgin sentences (in Russenorsk), evidence from spontaneous adult second language acquisition, and ample evidence from grammaticalization.

## **2. Ten arguments for the evolutionary primacy of linguistic arguments over linguistic predicates**

1. LPs presuppose LAs they act upon. A predicate applies to a variable, whose value is provided beforehand (Hurford, 2003b). This is the reason why a language without LAs is almost inconceivable, whereas a language without LPs seems accessible enough. One can utter *ship Amsterdam tomorrow* and be understood that "a ship will arrive in or depart to Amsterdam tomorrow" but a nounless English construction expressing the same, though possible, is not likely to be univocally understood. J. L. Borges has explored the possibility of a nounless language in one of his short stories (Borges, 1964). The sample text he produces relies heavily on imagination and adjectives, whereas a verbless language can do with nouns alone. Asymmetry is inherent to P/A (and hence, to the LP/A – Luuk) structure (Hurford, 2003c). Budd (2006) has suggested that in complex systems with asymmetrical dependencies, the functionally necessary core component must have evolved first in relation to the 'unnecessary' ones. Among words, LAs are the prime candidates for the functionally necessary core component. The same holds in mathematical logic: a predicate presupposes a variable it applies to, while a variable can occur without a modifying predicate. See also point 6 below.

2. Children's early productive vocabularies are dominated by nouns, and infant comprehension of object names appears earlier than comprehension of relational terms (Fisher, 2002; Gleitman, 1993). Although it has been argued that early noun dominance is not universal cross-linguistically, the evidence for this is still weaker than the evidence against it (Gentner & Boroditsky, 2001; Gopnik, 2000).

3. A virtual experiment (Steels, Kaplan, McIntyre, & Looveren, 2002) has identified a condition favoring nouns (i.e. LAs) for the first words – the condition that agents must have parallel non-verbal ways to achieve goals of interactions (e.g. pointing). Actions/changes are difficult to point to – other than, perhaps, by imitating or carrying them out. Accordingly, as compared to the first LAs, the first LPs would have been more elaborate in gestural modality. This in itself does not rule out the possibility that LPs came first, as it has, for instance, been proposed that language began as a "mixture of isolated grunts and gestures" (Bickerton, 2003, p. 81). However, the fact that language opted for vocal not gestural modality still favors LAs over LPs for the first words.

4. LAs appeal to geometrical and LPs appeal to kinaesthetic properties of images. As Pylyshyn has argued, the intrinsic properties of images are geometrical rather than dynamic, both because the spatial intuitions are among the most entrenched, and because there is evidence that geometrical and optical-geometrical constraints are built into the early-vision system. While we can easily imagine the laws of physics being violated, it seems nearly impossible to imagine the axioms of geometry or geometrical optics being violated (Pylyshyn, 2002). Prototypically, nouns are associated more with geometrical and verbs with kinaesthetic properties. However, kinaesthetic properties presuppose geometrical properties. For example, it is impossible to imagine movement without or outside space-time. This asymmetric dependency – the kinaesthetic properties of images depending on the geometric ones but not vice versa – together with the tendency of nouns to evoke geometric properties and the tendency of verbs to evoke kinaesthetic as well as geometric properties, suggests that nouns are cognitively more fundamental than verbs and verbs are cognitively more complex than nouns. This, in turn, suggests that nouns (LAs) may evolutionarily predate verbs (LPs).

5. Selective impairment of verbs is more frequent than selective impairment of nouns (Arevalo et al., 2007). There are two mutually nonexclusive explanations for this: 1. Extensive damage to the left hemisphere language areas induces the

emergence of right hemisphere lexical abilities that are limited to high frequency concrete nouns (Crepaldi et al., 2006). 2. Selective impairment of verbs is a function of argument structure complexity that is regularly associated with verbs. It has been shown that the impairment is greater with 3-place than 2-place verbs, and 2-place than 1-place verbs (Kim & Thompson, 2000). Moreover, production of argumental nouns like the Italian *passeggiata* 'a walk', *risata* 'laughter', *pugnalata* 'a stab', etc. is impaired at an equal level with production of argumental verbs (Collina, Marangolo, & Tabossi, 2001). I point out that all these findings are consistent with two hypotheses. (1) The N/V double dissociation in aphasia is an effect of the conceptual P/A double dissociation in the brain (the circumstance that argumental nouns are impaired at an equal level with argumental verbs refers to the conceptual P/A rather than the LP/A double dissociation). (2) The N/V double dissociation is an effect of argument structure complexity. It is difficult to disentangle (1) from (2), as they have many correlated features. I conclude that the fact that the processing of LPs is more specialized and/or resource demanding than the processing of LAs suggests that the latter may be evolutionarily more fundamental.

6. In all natural languages, LP is the cornerstone of syntax. Cf. Ross (1972, p. 325): "nouns are more inert, syntactically, than adjectives and adjectives than verbs". NL syntax is based on the principle that LPs take arguments that are differentiated by analytic (adpositions, word order) and/or synthetic (morphological) case markers. Thus, there seems to be an equivalence relation between NL syntax and LP (i.e., if a system has LPs, it has NL syntax; and if it has NL syntax, it has LPs). In addition, the utility of LAs without syntax is obvious but the utility of LPs without syntax is dubious (although imperatives can be syntactically independent, as they are optimized for producing and parsing speed). The hypothesis that LP is equivalent to syntax, together with the axiom that there was no syntax in the beginning (Jackendoff & Pinker, 2005), favors LA over LP for the first words. Bickerton remarks that symbol and syntactic structure can be dissociated – the latter without the former is useless, whereas the former is useful per se. He further argues that this logico-pragmatical dissociation has a historical counterpart: "a variety of factors /---/ suggest that, in the evolution of our species, symbolism may have preceded syntax by as much as two million years" (Bickerton, 2003, p. 81). It is a possibility, then, that the historical dissociation between symbol and syntax is distantly reflected in NL structure in the form of the LP/A distinction.

7. In analyzing the syntactic functions of major parts of speech, it has been frequently suggested that the function of nouns (including pronouns and proper names) is the most basic one. For a simplified language model, it has been found that noun is the only constituent class that all sentences have in common at the highest level of constituent-structure (Lyons, 2004). Referring to Jespersen, Lésniewski and Ajdukiewicz, Lyons conveys that nouns are "categories of the first degree" and that "all other parts of speech are derived, complex categories. Categories of the second degree combine with categories of the first degree (according to the principles of well-formedness /---/) to form sentences /---/" (Lyons, 2004, pp. 219-220). In analyzing semantic classes (situation, event, place, time etc.) Anward writes that "while the semantic class of person/thing seems lexicalizable by nouns, other semantic classes can be lexicalized in several ways" (Anward, 2001, p. 730).

8. Nichols has formulated two important principles of historical morphology: 1. Headward migration: "If any adposition or piece of affixal morphology moves, it will go from dependent to the head of the constituent, not vice versa" (Nichols, 1986, p. 86). 2. Reduction: the original dependents get cliticized and eventually become morphological markers of their head. Principle 1 suggests that the initial marking is more likely to appear on dependent. Together, the principles suggest a morphological migration pattern from dependent to head (e.g., from N to V). The fact that, cross-linguistically, verbal morphology appears to be richer than nominal morphology, is consistent with this. Although the evidence for it circumstantial, it is not unreasonable to suspect that the morphology appeared on older elements first. As morphology obscures lexical items' form and meaning, the latter have to be sufficiently conventionalized before any morphology can attach to them. It is plausible that older elements are more conventionalized than younger ones. Second, statistically, the longer an element has been around, the more chances it has had to attract morphology. Thus, the default assumption would be that the element that became a dependent is older than the element that became its head. An analysis of constituent types and their head-dependent relations confirms this. Cf. the following table (based on Helmbrecht, 2001, p. 1425):

Table 1. Constituent types and head-dependent relations

Constituent	Head	Dependent
1. NP	N	ADJ
2.	ADP	N

3. Clause	V	N
4.	AUX	V

From Heine and Kuteva (2002, 2007) it follows that, in three pairs (2, 3, 4), the dependent element is older than the head element. In one pair (1), the situation is the other way around. Thus, the evidence for the dependent element being older than the head element is stronger than the evidence for the contrary. Combined with the considerations put forth by Heine and Kuteva (2002, 2007), this adds up to a modest evidence that, in pair 3, N is older than V.

9. There are more nouns than verbs, and more productive noun than verb derivation in the world's languages (Gentner, 1981; Gentner & Boroditsky, 2001). This also suggests that nouns may predate verbs. In a system with fixed asymmetric dependencies between categories, one would expect the members of the evolutionarily older category to be more fundamental and (at least statistically) more numerous and varied.

10. The grammatical marking associated primarily with nouns – DET and POSS – has a more substantial role in the lexicon than the marking associated primarily with verbs (TAM and voice). In the world's languages, there is at least one example of TAM on DET (in Chamicuro – Nordlinger & Sadler, 2004). I know of no examples of DET or POSS on TAM or voice. This asymmetry – DET and POSS being more independent than TAM and voice – begs an explanation. A plausible explanation is that DET and POSS antedate TAM and voice. The circumstance that lexical items' form and meaning have to be sufficiently conventionalized before they can be modified by markers (cf. point 8) lends some additional support to the hypothesis that LAs predate LPs.

### 3. Conclusion

In reconstructing early language, Heine and Kuteva (2007) propose that at stage 1 there was only one lexical category, namely "nouns" (time-stable, referential units expressing primarily thing-like concepts), and substantiate their claim with three arguments. The present paper presents ten new arguments, gathered from a variety of domains, that support this claim. By itself, none of the thirteen arguments is sufficient to establish the primacy of LA over LP, but taken together, the evidence is overwhelming.

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