Tracing the development of numerals in the Guaviaré-Japurá (Maku) family
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This paper explores the development of numerals within the Guaviaré-Japurá (Maku) language family, spoken in and around the Vaupés region of the northwest Brazilian Amazon. Through a comparison of the numeral forms and subsystems found in the members of this family, this paper offers a case-study of the complexity of historical processes that may be involved in the development of a given numeral system.

The relatively well-developed numeral systems present in some Guaviaré-Japurá languages probably have a recent origin. Evidence for this includes the fact that almost all numeral forms across the family are etymologically transparent, and that no form can be reconstructed for the family as a whole. It is even more striking that not only no numeral form, but also no numeral system, is common to the entire family; in fact, the members of the GJ family exhibit three distinct approaches to numeral systems (not to mention the incorporation of Portuguese numerals). At one end of the spectrum is Nadëb, in which native numerals as such are reported not to exist at all; the language relies only on the quantifiers 'one', 'a few', and 'many' (Weir 1984:103-4). At the other end are Hup (data from my own fieldwork) and its closest relative Yuhup (Ospina 2002:455), which have a base-five system with distinct numeral forms between 1 and 5, with numerals above 5 expressed as compound forms based on adding fingers and toes. In between these are Dâw (S. Martins 1999:93-5), which has distinct numerals for 1-3, but then moves into an even-odd (or "fraternal") numeral system where a single form ("one has a brother") is reported to mean either 4, 6, 8, or 10, and another form ("one has no brother") is used for 5, 7, and 9. The limited data on Kakua suggests a similar "fraternal" system in which the even numerals 2, 4, and 10 are compounds involving the word for 'brother', while the odd numerals 3 and 5 incorporate the word for 'one' (Huber and Reed 1992).

One of the main catalysts for the development of numerals in the Guaviaré-Japurá family has undoubtedly been language contact. The Vaupés region has been documented as an area of intense contact between Tukanoan, Arawakan, and GJ languages (e.g., Aikhenvald 2002). Hup and Yuhup, the GJ languages located within the Vaupés linguistic area, owe the present form of their numeral systems in large part to diffusion from Eastern Tukanoan languages. Hup and Yuhup mirror their Tukanoan and Arawakan neighbors almost exactly in having:

1) Language-specific terms for 1-3
2) A form for 4 meaning 'having a brother/companion'
3) A form for 5 meaning 'one hand'
4) Forms over 5 involving added fingers and toes, hands and feet.

Whereas the Tukanoan and Arawakan languages in the region have etymologically opaque forms for the numerals 1-3, etymologies can be identified for most of these forms in the GJ languages. Thus while these may in some cases have taken shape according to an areal model, they relied on language-internal resources to do so. So '1' in Hup and Yuhup bears a close resemblance to the demonstratives 'that' and 'other' (respectively), and the forms of '2' in Hup and Dâw are both derived from these languages' words for 'eye'—although these are different, apparently non-cognate forms in Hup and Dâw. Finally, '3' in all three languages (except for one dialect of Hup) can be identified as 'rubber-tree-seed-quantity' (a distinctive three-lobed seed). Especially because Dâw is separated geographically from its sister-languages, the data suggest that these numerals were inherited from an earlier form of the language, but (at least in some cases) as metaphorical concepts rather than fixed phonological forms.

A final noteworthy feature of the GJ numeral systems involves the extremely wide-spread occurrence of the numeral 4 as a compound form meaning 'having a brother/companion,' which is calqued across at least four language families and over a geographic area much larger than the Vaupés. Some languages (including several in the GJ and Witotoan families) use this "fraternal" concept to express numerals in addition to '4'. Here again, the linguistic diffusion of the numeral is closely linked to the cultural relevance of conceptual metaphors, perhaps in this case involving kinship and marriage ties.

Although the exact details of their development may never be clear, we can infer enough from the GJ numerals to gain insight into the complexity of the processes that have contributed to the development of these numeral systems, even those that seem simple at first glance. These are processes that doubtless have been involved in the genesis of numerals and numeral systems in many languages of the world.

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