Is the absence of linguistic space-time mapping correlated with small number systems and the absence of calendric systems? A study of Amazonian languages

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Space-time mapping (or the employment of spatial metaphors for time) has been claimed to be a human linguistic and cognitive universal. However, research on an Amazonian language (sub-branch Tupi Kawahib) challenges the universality of linguistic space-time mapping at the constructional level. This language does not recruit its extensive inventory of terms and constructions for spatial motion and location to express temporal relations. The language also lacks a numerically based calendric system (Silva Sinha *et al.*, 2012). To account for these data, and in opposition to a Universal Space-Time Mapping Hypothesis, Sinha *et al.* (2011) propose the Mediated Mapping Hypothesis (MMH), which accords causal importance to the numerical and artefact-based construction of time-based (as opposed to event-based) time interval systems. MMH does not challenge the hypothesis that the cognitive foundations of linguistic space-time mapping are universal, but proposes that whether or not space-time mapping is entrenched in linguistic structure is determined by sociocultural factors. Specifically, MMH claims that linguistic space-time mapping is mediated by cultural technologies of number and time reckoning. The hypothesis is that such technologies permit the elaboration of artefacts such as calendar systems, and these in turn constitute a domain of abstract time that "invites" mappings from the spatial domain.

To test this hypothesis, it is necessary to analyze a larger sample of languages. This is the object of the present study, and we also test the further hypothesis that the absence of calendric systems is an areal feature of Amazonian languages, of which many (as is well known) are languages with restricted number systems. Based on questionnaire data obtained from native speakers, we have documented time interval words and numerals in 21 endangered languages in the Rondônia region of North-Western Brazil (some of which can be classified as moribund), belonging to the Tupí, Chapacura and Pano language families, as well as some language isolates. These languages may be assumed to be in historic contact relationships with each other, cross-cutting linguistic phylogenetic relationships and facilitating lexical borrowing. To determine the relative borrowability of the time interval lexicon, we have also obtained for each language Swadesh core lexical word list data, as well as more borrowable culture word data, based on lexical items from the semantic domains of religion and agriculture Carling *et al.*, in press). We have also obtained questionnaire data on space-time constructional mapping from speakers of six languages. Quantitative and qualitative analysis of these data will be presented, demonstrating that the pattern of data reported by Sinha *et al.* (2011) cannot be considered an isolated phenomenon or a mere linguistic curiosity, but demands cultural-cognitive and typological linguistic theorization. We shall also address the methodological problems inherent in employing only questionnaire methods for eliciting constructional space-time mappings.

References

Carling, G., Eriksen, L., Holmer, A. and van de Weijer, J. (in press). Implementing the matrix model: the method of contrasting linguistic and archaeological data by means of GIS and cluster analysis of the Arawakan language family. In: Anju Saxena & Taraka Rama (Eds.) *Comparing approaches to measuring linguistic differences*. Berlin: Mouton de Gruyter.

Silva Sinha, V., Sinha, C., Sampaio, W. and Zinken, J. (2012) Event-based time intervals in an Amazonian culture. In Luna Filipović and Kasia Jaszczolt (Eds.) *Space and Time in Languages and Cultures II: Language, Culture, and Cognition*. Human Cognitive Processing Series 37. Amsterdam: John Benjamins, pp. 15-35.

Sinha, C., Silva Sinha, V. da, Zinken, J. and Sampaio, W. (2011) When Time is not Space: The social and linguistic construction of time intervals and temporal event relations in an Amazonian culture. *Language and Cognition,* 3(1): 137-169.