

By JADRANKA GVOZDANOVIĆ, ed. **Numeral Types and Changes Worldwide.** (Trends in Linguistics: Studies and Monographs 118.) Berlin: Mouton de Gruyter, 1999. Pp. vi, 281.

Eleven papers are collected here in the editor's second book in this series to deal with the topic of numeral and numeral systems—see also Grozdanović (1992). In her 'Remarks on Numeral Systems' therein, G states, 'Numerals are language signs, with forms and meanings which fit in with the language structures in which they occur...characterized by relatively transparent form-meaning relations' (1). Thus, the interaction between the cognitive operations involved in counting and measuring and the linguistic systems that participate in them provides a fruitful field in which to study the relation between cognition and language.

James R. Hurford's 'Artificially growing numeral systems' attempts to study natural language growth, (i.e. 'change from a smaller system (or perhaps from nothing) to a larger system' (7), by applying computational techniques to numeral systems, following an Artificial Life paradigm known as 'Genetic Algorithm'. H concludes that 'a numeral system resembling the dominant type found in the world's languages [i.e., the decimal system] can emerge only very rarely,' and when imposed on a more-frequently emergent 'suboptimal system,' as found in many isolated language communities, 'is quickly adopted' (37). H's simulations suggest that this results from a 'real linguistic superiority (in coverage, lack of redundancy, and suitability to specifically human memory constraints' (ibid.), and not merely social factors. This observation has implications for the linguistic relativity hypothesis.

Werner Winter's 'When numeral systems are expanded' begins with the observation, 'in their use of numerals and numeral systems, people seem to respond to the conditions and needs of their respective societies' (43). W discusses expansion of counting and measuring systems in some Indo-European languages through borrowing from Latin, Greek, and Danish, and he shows

that Kulung, a Kiranti language spoken in Nepal, follows the Indic system, with primitive numerals for ‘10’, ‘100’, ‘1,000’, ‘100,000’, ‘10,000,000’, etc. (49, 51). An anecdote that also demonstrates borrowing of a numeral system has an informant for a Yuman (So. California) language using only Spanish numerals for counting.

Carol F. Justus, in ‘Pre-decimal structures in counting and metrology,’ notes, ‘faith in Neogrammarian sound correspondence’ that reconstructs ‘forms for decimal numbers back into a proto-Indo-European language’ ignores important data from nontechnical societies and reinforce[s] the assumption that the Indo-Europeans used an abstract numeral (decimal) system’ for counting (55). She further points out that our ‘knowledge of mathematics’ obscures the fact that units such as ‘ten’, ‘hundred’, ‘thousand’, and ‘million’ are ‘arbitrary, serialized units’ (56-7), which developed after other base units were in use. (See Martínez, this volume, e.g., for another view of the etymology of ‘100’.) Earlier, predecimal systems of counting appear to be based on ‘rank-ordered, relational units’ (73). This is supported with data comparing serialized units without independent numerical meaning (such as inch, foot, yard) and serialized nondecimal units, (such as pence, shilling, pound) with the Ancient Near Eastern token system of accounting for grain. Evidence of sheep-counting words from Welsh and from locations in North County (England) and intriguing anecdotes help make this paper a fascinating study of Indo-European counting and measuring structures.

Bernard Comrie’s ‘Haruai numerals and their implications for the history and typology of number systems’ demonstrates the use in Haruai of three numeral systems, one indigenous, one apparently borrowed from Kobon (a neighboring New Guinea lg.), from which ‘substantial vocabulary’ is borrowed (92 n.2) and one borrowed from Tok Pisin. The indigenous system has two morphemes, *pay* ‘1’, and *mos* ‘2’, and appears to reach its limit at *mosmos* ‘4’ (82). The

second is a body-part-word based system, in widespread use in New Guinea (*ibid*), in which counting is accomplished by saying the words for, or indicating, in order, the fingers (starting with the little finger) of the left hand, the wrist, forearm, elbow, biceps, shoulder, etc. (82, 83). For numbers higher than '12', the English (Tok Pisin) system is used (85, f). C notes that the systems were adopted as the culture developed. The bimorphemic system was efficient for a low number of items, and as trading relations developed, the need for a more efficient counting system was satisfied by the body-part system, and then by the Tok Pisin system. C states in conclusion that numerals are highly culture-bound, tied to education and trading (87).

The editor's 'Types of numeral changes' distinguishes numbers, 'units of counting', from numerals, the linguistic signs that convey them (95). G reviews data showing stages of development of 'number and numerical expression'. Awareness of number seems to precede quantity. Next, 'individuation of quantity' produces number concepts and sequences. Groupings are imposed, 'level differences in mathematical operations' are applied, and bases are introduced (96). Using data from descriptive and historical studies, G shows that numeral bases arise from shifts from 'indexes into icons, and then...to symbols...' never in the opposite direction (107). The scheme of development that G affirms may explain a seeming preference across many languages for bases of 4 or 5, 10, and 20.

Walter Bisang's 'Classifiers in East and Southeast Asian languages: counting and beyond' examines classifier systems of Modern Standard Chinese, Vietnamese, Japanese, Thai, Hmong, Burmese, Cantonese, and the Miao language of Weining. B shows that in 'most classifier languages, we find several classifiers which form a semantic system to classify nouns'. Classifiers are shown to perform the functions of 'individualization' and of 'classification'. Furthermore it is shown that there exists a 'semantic hierarchy', based on inherent properties of

the objects classified (animacy, humanness, social status, and shape, extension, etc.) that is ‘appropriate for the great majority of languages’ (124). This is significant from the standpoint that, outside a specialized study of classifier languages, one generally encounters classifier data presented as features of the syntax; here it is shown that classifiers participate in the semantic system and are involved in lexicalization processes (127 ff). B shows that classifiers may be involved in ‘individualization’ and ‘classification’ without being involved in counting, as when used with demonstratives in Chinese (132 ff). In addition to ‘individualization’ and ‘classification’, classifiers may perform the functions of ‘referentialization’, through which they signal reference to objects in the context, as when introducing items and their features into the discourse in Hmong and in Weining Miao (116, 150-51, 154), and ‘relationalization’ as in possessive constructions in Hmong, Weining Miao, and Cantonese (117, 156-7). This article presents a survey of the uses of classifiers, and the semantic, lexical, and pragmatic functions they fulfill.

B relies on data in Ahrens (1994) to make the interesting representation that in Chinese a ‘flexibility’ occurs such that two or more classifiers may compete to classify a given noun and that speaker selection may be motivated by the influence of the speaker’s perspective of lexical features, discourse situation, and the like (142). Considering this claim requires the elucidation of several facts about Ahrens’s data. Ahrens specifies that when she says “Mandarin Chinese” in her article, she refers to that variety of Mandarin Chinese spoken in Taiwan (n. 1, 240). One must be aware that among Taiwanese, 75% speak Taiwanese, which is mutually unintelligible with Mandarin, as their native tongue. Mandarin is learned in schools. Thus, strictly speaking, there are no native speakers of so-called ‘Taiwan Mandarin’. Speakers of that variety are subject, depending on their motivation, degree of education, etc., to the same processes of first

language/dialect interference as learners of other languages. Ahrens points out correctly that in standard Mandarin the most commonly used classifier is *ge*, which may occur with ‘nouns of many semantic categories’ (205). It is observable that this ‘general classifier’ is commonly substituted for a normal classifier in unplanned speech. Historically, *zhi* was lexically associated with birds as a classifier and later with some animals (see Ahrens 206). Ahrens presents numerical data showing that among 35 speakers of ‘Taiwan Mandarin’, 19 (53%) ‘neutralize’ the normal classifier for ‘snake’ (226), but she does not specify which classifier is used (presumably *zhi*). Although Ahrens speculates that this may be attributable to the animacy feature associated with *zhi* historically (n. 24, 243), she also correctly points out that *zhi* serves the same function in Taiwanese as *ge* in standard Mandarin, i.e., a general classifier (206, 228). I interviewed many informants, both from the PRC and from Taiwan; among the Chinese, none would accept *zhi* collocated with ‘snake’, while among the Taiwanese, several accepted it, with the proviso that this feature would likely occur in the speech of those whose Mandarin was not well developed, as a form of code-switching. It seems more likely to me that the classifier *zhi*, as the general classifier in Taiwanese, may be substituted for normal classifiers in Taiwanese Mandarin in some idiolects as a function of garden variety syntactic interference, but that evoking historical associations with birds and animals is a process of rationalization. In any case, the claim that in Mandarin Chinese normal classifiers are neutralized based on a competition among semantic categories cannot be supported by these data.

Grozdanović’s second paper in the set, ‘Some remarks on numeral morphosyntax in Slavic’ is of interest specifically to students of Slavic linguistics and students of syntax in general, tracing developments that show how cardinal numerals function in relation to phrasal heads, and in case marking and agreement; case properties may be coded on cardinal numeral

(the phrasal head), as in Croatian and Serbian (190), or distributed between the head and its modifiers, as in Russian (192 ff). G also points out that a cardinal number denotes a set of items, which may be marked singular in reference to the set or plural in reference to the several items.

Eugenio Ramón Luján Martínez, in ‘The Indo-European system of numerals from ‘1’ to ‘10’’, distinguishes between ‘change in numerals’ and ‘change in numeral systems’ (200). To exemplify the former, M says that I-E ‘6’ ‘may best be explained as a loan from Semitic’, as does ‘7’ (208). His discussion of the latter constitutes much of the meat of the paper. M surveys evidence that I-E ‘1’ through ‘3’ were deictic in origin (206-7, 210); ‘4’ relates to the four fingers or the width of the palm (207-8), and **oktō* ‘8’ resolves to a dual marker (-*ō*) and ‘4’, ‘best related to Av. *ašti* ‘width of four fingers, palm’ (207); ‘5’ is generally related to ‘fist’ and ‘finger’, but M credits the proposal that the word is also related to ‘all’ (207-8); ‘10’ seems problematic, but M prefers the proposal that the I-E root underlies **deks-* ‘right [hand]’ (209); and ‘9’ is generally related to ‘new’ (209). M concludes that achieving units for ‘1’ through ‘10’ remains far from demonstrating an original decimal system (212), as the grouping of ‘1’ through ‘3’ as deictic in origin, ‘4’, ‘5’, ‘8’, and ‘10’ as involving fingers or hands, and ‘9’ as ‘new’ (210) suggests. Thus, we see can bases for at least two, and possibly four distinct counting systems prior to the development of the decimal system.

Džoy (Joy) I. Edelman’s ‘On the history of non-decimal systems and their elements in numerals of Indo-Aryan languages’ traces the development of vigesimal and vigesimal-decimal systems in some Aryan languages, which are attributed to ‘substrate influences’. E shows that such systems can be found across language groups virtually throughout the world. E makes the highly relevant observation that numerals may become ‘etymologically obscure’ for speakers

over time, as she shows in Old Indian *dāśa* ‘10’ and *śatām* ‘100’, and in Modern Persian *dāh* ‘10’ and *sād* ‘100’ (235).

Lázló Honti’s ‘The numeral system of the Uralic languages’, surveys data for numerous languages in the group and rejects proposals that there is ‘no basis in fact’ for postulating a non-decimal numeral system in Uralic, Finno-Ugrian, Ugrian, (often, Finno-Ugric and Ugric) or Samoyed proto-languages. H likens the hand(s) to a calculator with two equal parts. He also mentions, in passing, the startling question as to whether it can be reckoned that in any period the Uralic language family lacked any counting system at all. This latter point raises a much more fundamental question than that encountered in numeral and counting systems, albeit one that these systems point directly to: what exactly does it mean to be human? If possessing language is what distinguishes human beings from other forms of life, and if language is the communicative means of social participation among humans, how can it be suggested that human society might exist without the concomitant linguistic expression of the central, human, cognitive functions of counting and numeration?

Paul Sidwell’s ‘The Austroasiatic numerals ‘1’ to ‘10’ from a historical and typological perspective’ seems to presuppose the highly controversial Nostratic hypothesis, which leads to the problem that Semitic and Indo-European, supposed by Nostraticists to ‘share a common ancestor’ (254, and S’s references), lack numerals of common origin; this in turn seems to S to suggest the notion that ‘it is completely possible that counting as we know it is a recent development in human culture’ (ibid.). S recognizes in ‘5’ a ‘cognitive threshold...rooted in the biology of the human body’ (255), although it is not clear why the five fingers (including thumb) only, and not the four fingers (excluding thumb) or the other body parts used in some counting systems are so wired into human cognitive process as to constitute such a threshold. But he does

show that in Ainu numbers above ‘5’ seem clearly derivational, based on subtractions from ‘10’, e.g., *iwanbe* ‘6’ = *inep* (Proto-Ainu **ii-*) ‘4’ before *wanbe* ‘10’ (255-6). Comparative numeral data across Northern, Eastern, and Southern Mon-Khmer, plus Munda are presented.

The papers in this collection focus on how numeral systems develop and change. In attempting to respond to this question, we are confronted with the manner in which language systems participate in human cognitive operations. In case after case we see that as cultures evolve, so do the demands on cognition and language, and we see powerful evidence that cognitive capacities, such as counting and measuring, are not circumscribed by their grammatical expressions, but that linguistic systems are developed to, or replaced with a system that does, satisfy social needs. These papers are an important contribution to the field.

References

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