In Honor of Mei Tsu-Lin

Studies on Chinese Historical Syntax and Morphology

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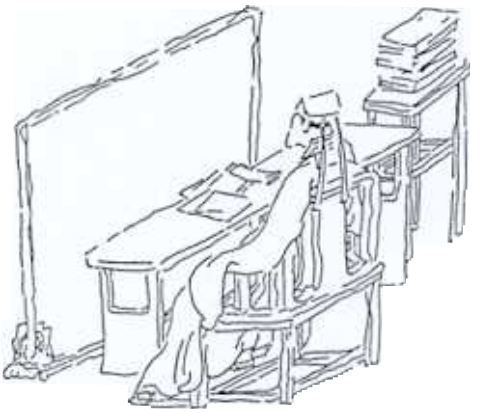

ECOLE DES HAUTES ETUDES EN SCIENCES SOCIALES
Centre de Recherches Linguistiques sur l'Asie Orientale
Paris - 1999

LANGUAGE EMERGENCE AND TRANSMISSION*

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INTRODUCTION

Edward Sapir speculated in 1921 that some form of language must have existed since hominids made their first stone tools. This we now know to date back over 2 million years ago. To fashion a diverse assemblage of tools out of material as hard as stone is a development unique to human evolution. It required a mental instrument that can manipulate imagery to a degree of precision and complexity greater than that achieved by any other species.

Taking cue from what we know of primate societies today, it is reasonable to believe that the communicative repertoires of bands of *Homo erectus* were at least as great, and that varieties of prelanguage were in use. The repertoires probably included both visual signals in terms of facial expressions and bodily gestures, and acoustic signals coded in modulations of prosodic features, i.e., the pitch, intensity, and quality of the voice. Indeed, all peoples still gesture during speech, though to different degrees, and all languages use intonation.

1. THREE THRESHOLDS TO TRUE LANGUAGE.

The first major threshold toward language was crossed when some early hominid realized that these signals produced consistent consequences in the hearer even though the signals and the consequences are not causally related.[2] We may refer to this threshold as ***symbolization***. This realization may very well have first occurred when imitating natural sounds or when uttering involuntary noises; but the threshold was crossed only when the symbol became completely abstracted from its

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* Professor Mei Tsulin and I first corresponded in the early 1960's. At that time he was writing on philosophy of grammar, and I on generative syntax. We have both traveled on many different roads over three decades and more, trying to understand language from various perspectives. However, from whatever perspective, Tsulin's work has always been a source of stimulation for me and a standard to emulate. I am happy to be able to join his friends and colleagues in this volume to honor him.

original context and could be used freely. However, several more thresholds need to be crossed before such prelanguages evolved into the refined and powerful instruments of the mind that our languages are today.

As contrasted with visual signals by facial or body movements, acoustic signals have distinct advantages in that: [1] they are omni-directional and carried over greater distances; [2] they can be received across visual barriers and in darkness; and [3] they can be emitted concurrently with other physical activities, such as those required in hunting. However, prosodic features used in primate calls are few in number, and they carry very low information content per unit time. The next major threshold prelanguage crossed was the organization of acoustic signals into chains of syllables, which is the invention of ***segmental phonology***.[3]

Crossing this threshold eventually achieved two critical advantages. One is that it greatly expanded the number of unit signals in the repertoire — up to many dozens of distinct segments found in some modern languages. This allowed the construction of large vocabularies — to include up to thousands or even tens of thousands of words[4]. The other advantage has to do with the rapid rate at which the segments can be emitted, sometimes as many as a dozen segments per second. These two advantages allowed prelanguage to transcend the limitations of our short term memory,[5] and laid the foundation of syntactic organization.

Since words are emitted one after another in time, order is unavoidable and therefore, in a sense, free to the user. The invention is to invest order with a hierarchic function so that the sequence of words can achieve a systematic set of relationships among themselves. As Herbert Simon has observed in his discussion of the architecture of complexity, hierarchic organization is to be expected with all systems that pass a certain level of complexity, and language is no exception. True language emerged with the invention of ***syntax***, i.e., assigning function to word order, which is the last of the three thresholds.

Like symbolization and segmental phonology, the enrichment of syntax must have been a gradual process as well. Whereas the construction of words allows for some very limited degree of recursion, such as in the word "losslessnessless-ness ...", recursion in syntax is the primary device which gives language the power to "make infinite use of finite means." This is exemplified clearly in the well-known nursery rime: *This is the house that Jack built*. Recursion is a device which presumably is present in all languages.

On the other hand, syntactic devices which involve complex relationships among the constituents probably emerged relatively late in language evolution. Some of them may have been facilitated by the availability of written language. Therefore these devices may not be universal, especially among preliterate

communities. A possible example is sentences where both the topics and the comments are indirectly compared, as in:

She is more beautiful than he is rich.

Another possible example is sentences where the cross-serial relationship among the nouns is indicated by a learned word like "respectively," as in:

Tom, Dick and Harry are the doctor, lawyer and chef respectively.

There is no reason to believe that these three inventions, i.e., symbolization, segmental phonology, and syntax, were all made in a neat linear order, or that they were all made along a single hominid lineage. Chances are that over these numerous millennia there were many false starts which vanished without a trace. Also, contact among the early tribes must have stimulated and enriched language evolution; conceptual advances made by one tribe would be quickly adopted by another tribe much in the fashion of all preferred cultural innovations.

Speaking in strictly probabilistic terms, it is much more likely that language emerged at many different sites, that is, by polygenesis rather than monogenesis (Freedman and Wang 1996). This does not preclude the scenario, of course, that at some early stage of human evolution all the ancient languages were eliminated except for one, and this one language, Proto-Sapiens, is ancestral to all modern languages.

Indeed, the Out-of-Africa hypothesis of *Homo sapiens* currently investigated by anthropologists and geneticists points toward such a scenario[6]. Recent studies with mtDNA and the Y-chromosome suggest dates around 150,000 years B.P. Some such scenario, preferably one with even shorter time depth, is also assumed by linguists who search for global etymologies, i.e., words which are presumed to trace back to Proto-Sapiens. The later Proto-Sapiens persisted before major human diasporas, the likelier global etymologies can be found, since obviously words get replaced much faster than DNA.

The suggested date of some 40,000 B.P., around which time the "creative explosion" (Pfeiffer 1982) occurred in the form of art, religion, tool assemblies and long distance navigation, is clearly more promising for global etymologies. In an earlier discussion (Wang 1976), I distinguished between the emergent state, before the three thresholds were all crossed, and the steady state, when languages are relatively complete in their structure. After human language has reached a steady state, they appear to remain largely in a state of equilibrium, and change mostly takes place in a cyclic fashion, in which simplification in one component of

language is compensated by elaboration in another component (Hodge 1970). Such compensation may eventually be analyzable within the framework of complex adaptive systems (Gell-Mann 1992).

This date of some 40,000 B.P. seems to be a good candidate for when the transition took place from one state to the other. Principles of uniformitarianism do not apply strictly to all three scales of diachrony in language evolution (Wang 1978), since the mechanisms of transmission are different between the emergent state and the steady state.

Even with this relatively recent date, tracing linguistic lineage will present great difficulties. Several major glacial pulses have taken place during these 40 millennia. As populations migrated intensively to adjust to severe climate changes, or to escape plagues and other disasters, both their genes and their languages must have been significantly scrambled as well. Discovering global etymologies, however, is a different task from tracing specific lineage, and may be more accessible.

2. HORIZONTAL TRANSMISSION AND HYBRIDIZATION

If Asian and European hominids had languages back then, it would be likely that some features of these languages would have left traces on the language brought out by the African conquerors. If so, these traces would be well nigh impossible to detect now. In the terminology of Cavalli-Sforza and Feldman (1981), features from the ancestral language have come down to us via vertical transmission, while features assimilated from contact with other languages come via horizontal transmission.

The central problem in studying language through time has to do with distinguishing the features due to the two modes of transmission. The two sets of features need to be separated one from the other if we are to ever arrive at an accurate prehistory. Yet such separation is extremely difficult, especially when the languages involved remain in close contact for long periods. Such is the case with most of the dialects of Chinese, which have repeatedly assimilated large numbers of words from prestige dialects of the north for well over two millennia.

To illustrate this point, consider the table below, which presents data from the Chaozhou dialect of Guangdong (Wang and Lien 1993: 369). Each Chinese syllable can be divided into the three components shown in the top line of the table: initial, final and tone. The "L" in the table stands for "literary", which refers to a linguistic feature that is imported from a northern dialect. In contrast to "L", the "C" stands for "colloquial", which has been traditionally used to refer to features that are believed to be indigenous to the dialect[7].

This is to say, C features were vertically transmitted while L features were horizontally transmitted. Thus in the first line of the table, we see that for the word 'to feed', all three components of the syllable are from the literary layer. On the other hand, all three components for the word 'oath' are colloquial. To contrast with these two "pure" cases, the word 'noisy' is a hybrid, where the initial is colloquial while the final and the tone are literary.

	Initial	Final	Tone	Example		
1.	L	L	L	飼	su 2b	to feed
2.	C	C	C	誓	tsua 3b	oath
3.	C	L	L	鬧	lau 2b	noisy
4.	L	C	C	露	lou 3b	dew
5.	L	C	L	露	lou 2b	dew
6.	C	L	C	謝	tsia 3b	thank
7.	C	C	L	量	nio 2b	quantity
8.	L	L	C	誓	si 3b	oath

The point the table makes is that all forms of hybridization can be found in Chaozhou, of which there are 2^3=8 possibilities. Obviously, it is extremely difficult to identify the sources of such hybrid words — the further back in time the more difficult the identification, since we will have less and less cues to rely upon.

Cases of hybridization are not at all rare; it is easy to cite English examples where Germanic, Greek, Latin and Romance components mix in with each other in various ways. A particularly conspicuous example of hybridization in recent years is the word *karaoke*, made up from Japanese *kara* and English *oke*[8]. The Chinese case illustrated in the above table is more telling because of the monosyllabic structure of many of its words. Such cases of rampant hybridization due to horizontal transmission pose a severe challenge to our effort at sorting out the various strands of linguistic lineage.

Given the more sophisticated understanding we have gained in recent decades about the mechanisms of linguistic change, some of the assumptions which underlie the comparative method have come under greater scrutiny[9]. In particular, the assumption[10] of exceptionlessness in sound change has often led to the reconstruction of protolanguages which get more unwieldy and less realistic the further back we go in time. Nonetheless, the comparative method is still a valuable tool for studying the prehistory of languages. Both reconstruction and taxonomy will rest on more secure foundations if the method can be refined and developed further. This can be done along several dimensions.

3. SEMANTIC CHANGE

One dimension in which evolutionary research in linguistics has been especially hampered is semantic change. While phonetics can often tell us which sounds typically change into which other sounds, we have no comparable knowledge with respect to which meanings typically change into which other meanings. It is not surprising of course that we should understand sound change a lot better, since the vocal tract and the ear are organs which are relatively accessible to investigation. In contrast, it is significantly harder to understand meaning change since it involves our entire cognitive system as well as the socio-cultural environment in which language is used.

We may illustrate with two cases of semantic change in Chinese. One is the word *nong* 儂, which has changed from the 1ps pronoun 'I' to the 2ps pronoun 'you' in the Wu dialects. Whereas the features which separate the two pronouns must be minimal, the change actually took place via a complicated process, according to the analysis of Pan and Chen (1995). The other is the verb *wen* 聞, which used to mean 'to hear'. This is evident from the graphic component inside the written character, *er* 耳, which means 'ear', the organ for hearing. Intriguingly, this verb now means 'to smell', which is a function performed by a different organ altogether. It would be useful for a theory of semantic change to know if such switches of sensory modality are common and what triggers their occurrence.

Parallels can be found, of course, between sound change and meaning change. Thus the two cases illustrated above, unusual though they may be, involve changes within natural classes — one within pronouns and the other within sensory verbs — much as sound changes do. Another parallel is that there are chain shifts in both domains. Phonological chain shifts have been often attested, and explained sometimes by reference to perceptual space. Semantic chain shifts, however, are relatively scarce in the literature. An example of a semantic "pull chain" from Chinese involves the verb *xing* 行, which used to mean 'to go' in a physical sense. This early meaning of *xing* is preserved in modern Cantonese. The phonetic forms of the verb are different, of course, due to various sound changes.

The sense of this verb, much as it has in many European languages, became increasingly abstract. In Putonghua, its primary meaning has shifted to something like "o.k.", such as in the question "*xing bu xing*?" which roughly means "is it o.k.?"

This semantic shift created an empty slot, which was filled by the verb *zou* 走 which used to mean 'to run'. This early meaning of *zou* is also preserved in modern Cantonese. The empty slot for 'to run' thus created in Putonghua is then filled with a new verb, *pao* 跑 The pull chain sequence is shown in the table below. I expect

that such sequences are probably not difficult to find once we focus our attention on them.

	Run	Walk	O.k.
Cantonese	*zau*		
Putonghua	*pao*	*zou*	*xing*

Changes in meaning must also have universal tendencies, as there are for changes in sound. One would expect the former to be much more complex and diverse, of course, since meaning reflects the total gamut of human experience whereas speech sounds reflect just the physical and physiological constraints of our anatomy. One obvious tendency that has been widely observed is that of grammatization[11], as defined for instance by J. Kurylowicz in 1965, quoted by Traugott and Heine (1991: 149):

> Grammaticalization consists in the increase in the range of a morpheme advancing from a lexical to a grammatical or from a less grammatical to a more grammatical status, e.g., from a derivative formant to an inflectional one.

For the history of Chinese, the most comprehensive study so far is Sun Chaofen's dissertation, published in 1996[12]. It is becoming increasingly clear that the lexicon is mostly enriched via a process which biologists call "pre-adaptation", i.e., making use of pre-existing structures for novel functions. The formation of metonyms, metaphors, as well as many grammatical structures are really assigning new (semantically more abstract) uses to old (semantically more concrete) structures.

In an earlier discussion, I tried to highlight universal tendencies in semantic extension with the example of *high* and *gao* 高 (Wang 1991: 53):

> Can it be just an accident that we use the same adjective *high* to refer to such disparate phenomena as: [1] extending upward, as in *high mountain*, [2] elated, as in *high spirits*, and [3] fast vibrations, as in *high soprano voice*. The question becomes even more intriguing, for words in other languages are frequently polysemous in the same way. In Chinese, for example, the adjective *gao* includes precisely these three meanings, i.e., *gao shan*, *gao xing*, and *gao yin*, respectively.

To come to clearer examples of grammatization, here are two examples of semantic extension for Chinese and English. "To have" is more concrete as a main verb of

possession, as in *they have a book*, but more abstract as an aspect marker, as in *they have not gone*. The counterpart in Chinese is *you* 有, as in *tamen you yiben shu*, and as in *tamen mei-you*[13] *qu*, respectively.

Similarly, "to will" is more concrete as a main verb of volition (though the corresponding noun is better preserved in Modern English with this meaning), but more abstract as a marker of the future tense, as in *they will go*. The counterpart in Chinese is *yao* 要. Once I heard a Chinese speaker announce at a meeting which was running late: "*wo hai yao jian jizhe ne*"; literally translated: "I still future-tense see reporters particle". Then, suddenly realizing the volitional content of the main verb, he got flustered and qualified with "*wo buyao*", meaning that he really had no wish to do so.

It is surely no accident that the semantic extensions of *gao, you, yao* all have their counterparts in the development of English, as well as in the development of many other languages. The semantics here is comparable to the phonological fact that velar consonants have undergone palatalization in both languages, as indeed they have presumably in all languages. Whereas sound changes are mostly subject to phonetic forces which are relatively simple and well understood, semantic changes are cognitively and socially driven and we have very little knowledge of these forces so far[14].

NOTES

[1] These remarks are based on presentations made at meetings held at the Cold Spring Harbor Laboratory in October 1997 (organized by L.L.Cavalli-Sforza and J.D.Watson), and at the Santa Fe Institute in December 1997 (organized by M.Gell-Mann and M.Ruhlen). I thank the organizers of these meetings for the opportunity to discuss some of the issues touched upon here. Gell-Mann (1994: xiii) has given the name "Odysseuns" to people in search for connections among ideas, particularly across disciplines. I happily count myself among them. Acknowledgment is also made to the City University of Hong Kong, the Research Grants Council of Hong Kong, and to the Chiang Ching-kuo Foundation for their support of my research on endangered languages and on language evolution.

[2] Recall the illumination described by Helen Keller when she first realized that the finger strokes her teacher spelled into one hand were a symbol for the water that was flowing over her other hand.

[3]The alternating opening of the mouth for vowels and closing it for consonants is a function adapted from rhythmic chewing, much as speech itself is a function

adapted from respiration and mastication. Vowels provide the acoustic power while consonants provide the basis for perceptual differentiation.

4 However, as Darwin noted early in his *Descent of Man*, there is an upper limit to what the human memory can hold as active vocabulary. Memory provides a kind of "push through store" where new words enter the language while old words fade away. Presumably this upper limit is roughly comparable for all languages.

5 Notice the increasing difficulty we have remembering telephone numbers when they are spoken with intervening pauses of greater length. The same difficulty occurs with sentences in which their major constituents are separated by too many words.

6 A recent popular account is by Stringer and McKie (1997).

7 The division of the vocabulary into only two layers, i.e., the so-called *wen-bai yidu* currently observed in Chinese linguistics, is clearly an oversimplification, considering the millennia of interaction among the languages and dialects of China. Finer division into several layers according to time of borrowing and geographical source, as in the kan-on, go-on, min-on, too-on, etc. in Japanese linguistics, is much more realistic.

8 *Kara* in Japanese means 'empty', cf: the form of fighting called "karate", which means 'empty handed.' *Oke* is truncated from "orchestra". The literal meaning "empty orchestra" is extended to situations where one can sing along without an orchestra with the help of pre-recorded multimedia materials. The situation is similar to music students buying "minus-one" recordings, where the accompaniment is supplied to help the student practice his "one" instrument.

9 M. Durie and M. Ross (1996, eds.). This book contains judicious discussions of the strengths and weaknesses of the method, as well as some advances in methods for reconstructing morphology and semantics.

10 This assumption is based on the belief that sound changes are phonetically gradual and lexically abrupt. Such a belief has no empirical basis, as can be seen in the several decades of research on lexical diffusion, recently reviewed by Chinfa Lien in the *Encyclopedia of Language and Linguistics*.

11 *Grammaticization* and *grammaticalization* are other words currently used for the same concept. The concept was first defined in the western tradition by A.Meillet in 1912, according to Traugott and Heine (1991: 17). However, the concept was cryptically described some 600 years ago by a Yuan dynasty scholar by the name of Zhou Boqi, when he wrote 今之虛字皆古之實字, i.e., "present-day grammatical words were all substantive words of ancient times." Quote and translation taken from Sun (1996: 11).

12 See the detailed review by Chappell (1998).

[13] A negative sentence is used here to illustrate the point, since a different syntax is used in Putonghua in affirmative sentences, where the *you* surfaces as a post-verbal *le*. See Wang (1965) for details.

[14] Recent efforts to uncover chain shifts in semantics are opening avenues of research which are especially promising, cf: those proposed by Heine et al. in Traugott and Heine (1991: 157), and by Wilkins (1996).

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