MATRIX FORMATIVES IN N-DIMENSIONAL LINGUISTICS

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A few years ago I was lecturing in Vietnam, and one of the scholars mentioned his malaise with what he called "Euro-centered linguistics". I have pondered that statement ever since, wondering if I could put my finger on the problem as perceived by him, but in relation to my own half century of working in America. This is my attempt to suggest the source of the difficulty, in relation to western linguistics from--say--1935 (when I started my work) into the forties, with suggestions as to how my own work has since then attempted to meet the problem by focussing on revised or additional approaches--some of which, of course, overlap with the work of other scholars, or were foreshadowed by them.

UNITS VIEWED AS PARTICLES [CHUNKS] IN SEQUENCE OR SYSTEM

In grammar, emphasis in American linguistics has often been on languages with agglutinative morphology--with words which may have had various prefixes, plus a stem, and suffixes. For example, Nida, in his classic book on the analysis of morphology, says ([1946] 1949:101) that for Totonac (of Mexico) 'In the [verb] word kilila:pa:s^kí:qú:t "my necessity of loving them reciprocally" there are the following morphemes: kí-, first person possessive prefix added to nouns, li-...-t, a noun formative meaning "it is necessary," la:-, reciprocal prefix added to verbs, pa:s^kí:, the stem "to love," -qú:, third person object suffix.' ..The noting of the sequence of morphemes is typical of the focus ofthat time on a linear sequence of morphemes. Along with the emphasis on morphemes in linear sequence, there was also American emphasis on phonemes in linear sequence.

There was very little attention placed, however, on
hierarchical arrangements of consonantal sequences within
syllables (with some consonants more nuclear, versus
others, more marginal to the sequence than others), plus
hierarchical arrangement of vowels within those syllables
(tied, in turn, to arrangements with tones), until Pike
and Eunice Pike, for example, discussed such matters
concerning Mazatec of Mexico (Pike and E. V. Pike 1947:81,
where a word-initial cluster hnt- has hn subordinate to the
t, and the three are subordinate to the following vowel
or vowel set plus tone). Bloomfield, much earlier, had had
substantial reference to syllables (e.g. 1933:120-25, 287-
90), but--in my memory--this material did not seem to have
much influence on a number of his immediate successors.
Recently, however, scholars have worked on such materials
in much greater depth. (See, for example, Hogg and McCully
1987:42, where the syllable has been 'organized
hierarchically into Onset + Nucleus + Coda, where the
latter two formed a Rhyme constituent.')

For the combination of English phonological hierarchical
materials beyond the syllable, combined with the pitch of
intonation on units which simultaneously include explicitly
both paradigmatic and syntagmatic components for
American English, In my book in 1945, there is included,
above the syllable, rhythm units both simple and complex
(1945:25-40, 44-106--"contours"); the material on pitch is
there attached to and (in part comprises) the contours (and
may be related to pauses, for example--1945:31, 40, 104,
special contours 68-70, chants 71, and drift or spread of
intervals 76-76). These items are syntagmatic. On the
other hand, four phonemic levels--with paradigmatically
replaceable contrastive pitch units--were treated there
extensively (e.g. 1945: 25-26.44-75). The nucleus of a
contour would have there been on a syllable which had one
of the four contrastive pitch levels. Although a contour
was made up of a sequence of paradigmatic (replaceable)
bits, the total contour itself was in one sense viewable
as syntagmatic, since it could occur as part of a sequence
in larger unit; these larger units were themselves
replaceable, hence were simultaneously paradigmatic as
larger entities. Note the sentence He said he wanted to
GO with me, which has high pitch and stress on the word go,

stepping down to low pitch on <u>me</u>, with the stressed syllable preceded by a sequence of mid unstressed syllables; then compare that with the same sentence with extra high pitch on the stressed syllable, or with low stressed pitch on that syllable followed by unstressed pitch rising on the end of the sentence. The sentences as wholes, also, can be substituted for each other (paradigmatically) for signalling different attitudinal overtones. But any one of these whole "normal" sentences is different from a <u>chant</u> such as <u>SUsieIS a TAttle TALE</u> (1945:71). This chant begins with the high stressed starting syllable (shown by capital letters) of <u>Susie</u>, followed by high level unstressed end of that same word, followed by mid but stressed <u>is</u>, and then extra-high unstressed <u>a</u>, followed by the high stressed start of the word <u>tattle</u> which ends as unstressed high, followed by stressed <u>tale</u> which occurs on a level unglided mid pitch. The chant as a whole communicates a taunting complaint (and is well known by the children of the community). For an extensive summary of current viewpoints on British and American intonation, see Tench [1988]. For my own most recent discussion of paradigmatic versus syntagmatic views in relation to hierarchy, see Pike 1991, In Press.

UNITS OF STRUCTURE VIEWED AS WAVES

Thus far, I have been emphasizing units <u>perceived as</u> "chunks", that is, as <u>particles</u> which can be differentiated in relationship to their sequence one after another. The linguistic analyst, however, as observer of the data, can <u>choose to look at </u>the same units as overlapping (i.e. as merging, as non-separable units)--i.e. as <u>waves </u>of human behavior, with no actual physical gap between them. In phonology, one sound--before it is finished "in itself"-- may in part anticipate the next one, partially merging with it. For example, in the words <u>bit </u>versus <u>boy</u> the /b/ of <u>boy</u> has the lips partly rounded in anticipation of the vowel following it. That is, the sounds may themselves be viewed as waves, with nucleus representing the most complete or psychologically important part of the sound plus the margin as the approach to it and/or the release from it. As I stated in 1943:107: 'A segment is a

sound...having indefinite borders but with a center that is produced by a crest or trough of stricture'.

Similarly, morphemes in sequence can partly affect one another phonologically (morphophonemically), as when the voiced ending of dog in English forces the plural /s/ to be replaced by /z/. Much of the technology for such a description came from the east--from India, via descriptions of Sanscrit, about three hundred B.C. (cf. Bloomfield 1933:11--'one of the greatest monuments to human intelligence').

It was not until 1959 that I introduced into linguistics the terms, from physics, of particle, wave, and field. I continue to find the terms very helpful--and am building the present article upon the assumption that they are metaphorically valid for this purpose. Note that, already, I have used a kind of chunking (particle) approach to mention sounds, morphemes, syllables, and larger intonation groups. But at the same time, I have already also referred to some of their wave characteristics, as nucleus and margin (e.g. a consonant as the margin of a syllable, with vowel as its nucleus), and the wave-like overlapping (partial fusion) between such units. (For a recent extensive discussion of rhythm units shown by various hierarchical notations, via metric phonology, see Hogg and McCully 1987.)

Further wave characteristics can be postulated for semantics--with a nuclear (or normal, or central, or 'proto-typical') meaning, along with more rare or marginal meanings, caused by wave-like fusion of central meanings to semantic contexts--not by fusion of sound to sound. For example, one may say run a race (with the normal usage of run) or run a business (with a marginal usage of the same word) in English. A wave view can also be applied to a story--with its climax as the nucleus of the story-as-wave, and its introduction as a margin of that same story.

A different kind of overlapping materials, from a different approach, can be seen when different levels (or tiers) of data merge, by having features or units from one of them move frontwards or backwards on to (or relative to) one of the others. Levels of segmental sounds, suprasegmental pitch, or subsegmental voice quality, interlock with