

On the Nature of Prosodic Phrasing

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0. Synopsis

Evidence for **prosodic structure** has arisen in many areas: from linguistics to poetics, from phonology to pragmatics, from performance as well as competence.

This evidence seems to motivate a single representational theory, with broad empirical consequences, connecting the form and meaning of a message with the motor organization of speech production and the structural inferences of speech perception.

{If successful, this theory would be a triumphant vindication of representational realism. }

Thus very diverse evidence seems to bear on a single level of mental representation. However, closer inspection suggests that the induced structures are diffuse and diverse.

In pursuit of clarity, we propose for discussion an alternative theory, in which no distinguished level of prosodic structure exists. Iconic expression of non-prosodic structures is given a key role in the creation and interpretation of prosodic patterns, with culture and convention playing the same role as in the interpretation of other sorts of gesture.

Since we rely on structures and processes that exist in any case, this theory should be treated as a null hypothesis, to be disproven if possible.

1. Prosodic structure

1.1. Defining Characteristics

Prosodic structure in the strong sense:

—is essentially phonological, and thus distinct from structures proper to syntax, semantics, pragmatics

—is the sole representation on which phonology operates, and thus mediates all connections of phonology with syntax, semantics and pragmatics

—is related to the structures of syntax, semantics and pragmatics by (nearly) universal principles

—is made up of categorically distinguished levels (the **prosodic hierarchy**) with characteristic associated phenomena

—is the representation that controls speaking and is directly inferred in listening, and thus underlies speech production and perception

—is the domain on which all norms of metered verse are defined, and controls the association of words with music

1.2. Sources of evidence for *prosodic structure*:

- prosodic phonology
 - ~ stress and accent
 - ~ sandhi rules
 - ~ distribution of junctural tones
- speech production
 - ~ timing
 - ~ pitch
 - ~ amplitude
- perception
 - ~ subjective grouping
- poetics

1.3. Proposed Levels of the Prosodic Hierarchy

Between three and seven levels, drawn from:

- Discourse units
- Phonological Utterance (U)
- Intonational Phrase (I)
 - Intermediate Phrase
 - Accentual Phrase

- Phonological Phrase (P)
- Clitic Group (C)
- Phonological Word (w (omega))
- Subword units:
(Foot, Syllable, sub-syllabic timing units)

1.4. Some proposed hierarchies

Hayes (1989) (similar to Nespov and Vogel, Selkirk):

Word (final devoicing)
 Clitic Group (Latin clitic stress; English v-deletion, palatalization)
 Phonological Phrase (Chimwi:ni length; French liaison; raddoppiamento sintattico; rhythm rules)
 Intonational Phrase (English intonational tunes)
 Utterance (r-epenthesis; pausing)

Pierrehumbert and Beckman (1988) for Japanese:

Mora, Syllable, Word,
 Accentual Phase (at most one HL pitch accent; initial H and final L)
 Intermediate Phrase (domain of catathesis)
 Utterance (initial L, final H if Q)

2. The bad news

Connecting the inner and outer forms of language, **prosodic structure** in the strong sense would be a wonderful gift to linguistics.

Unfortunately, the evidence for structures meeting this definition is equivocal in four key respects.

(Especially for structures above the level of the "clitic group").

3. Problems with the Prosodic Hierarchy

First, (most) effects of prosodic constituency are gradient with respect to junctural strength, and thus do not provide any clear evidence for qualitative constituent types.

Second, the hypothesized prosodic structure is extremely ambiguous in practice, so that determinate, intersubjectively valid descriptions are not generally possible if the hypothesis of qualitatively distinct prosodic levels is maintained.

Third, (most) clear "prosodic" constituents seem to correspond to independently-needed units, generally from the domain of information structure.

Fourth, (some of the) key phonetic correlates of prosodic structure can be seen as natural solutions to the problems of presenting the (non-prosodic) structure of messages and of managing communicative interaction.

3.1. Gradience

v-deletion and palatal assimilation limited to C?

rhythm rule limited to P?

As Hayes says, such rules "are constrained by the Prosodic Hierarchy in gradient fashion," so that only the relative frequency of the process, or the postulated level of carelessness, are actually predicted by any particular level. As a result, such rules cannot effectively define qualitative distinctions in constituent type.

Sociolinguists have shown that such gradient and variable linguistic processes are hard to describe accurately by introspective means alone— for some of the same reasons that thinking about riding a bicycle does not substitute for the study of actual riding.

Compare the categorical nature of the two Latin stress rules, one in words and the other in clitic groups.

Different values of pre-boundary lengthening—

One value for each distinguished prosodic level?

or gradient marking of relevant structural divisions?

Beckman and Edwards (1990) vs. Fowler (1990).
 Phone number data.

3.2. Ambiguity

Hayes (1989):
 "I-phrases are clearly audible in English because each one is aligned with a single 'tune' of the intonational system."

Alas, no. The different postulated levels of prosodic boundary are usually ambiguous, and there is also a nearly-systematic ambiguity of pitch accents and boundary tones.

3.3. Independence

Cf. Steedman, etc.

3.4. Iconicity

In prosody, the arbitrariness of the sign is attenuated.

There are cultural differences, but perhaps more like differences in gesture, gait and posture than like differences in the regular lexicon.

How much of prosodic form and meaning can be treated as culturally-situated diagrammatic icons?

The analogous case would be making written signs, using spacing, line breaks, character style and size, color, pagination and so on.

Most of us would think of general sign-making in terms of the intelligent planning of communicative acts, not a simple syntax-directed translation of linguistic structure into visual signals or motor commands to the drawing hand.

Real-life prosody is often conventionalized and full of automatisms, and it may be that there is an encapsulated part that has properties like those attributed to the Prosodic Hierarchy. However, our models must also make room for the fact that people shape their speech, freely and more or less artfully, to enlighten, engage and even entertain their audience.

4. Program

Two complementary approaches seem appropriate:

First: carefully model the form and meaning of certain prosodic modulations of speech, in constrained and controllable domains.

Second: study the prosody of natural speech, across various communities, genres, and languages.

Neither approach is likely to succeed without the other.

{Formal models that are not observationally adequate need to be reshaped. A descriptive program that does not lead to testable models stagnates.}

5. Possible Theories of Prosodic Structure

The results of such research will be theories of prosodic structure that vary along several dimensions.

Dimensions of prosodic theorizing, explained and exemplified.