# Some Formal Contrasts between Language and Other Forms of Behavior-Action

by

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**Abstract**. Formal linguistic models are useful to anthropologists to the extent that language shares fundamental properties with other forms of human cultural behavior. The notion that language is composed, mostly, of discrete and easily identifiable units -- phones, phonemes, morphemes, lexemes, and sentences -- is a fundamental starting point for linguistic models. Another fundamental notion is that the segmental units of language are linearly ordered (strictly sequential in time). By contrast, the stream of behavior is notoriously difficult to segment, and strict linear orderings among behavioral-action units, even when they do occur, transpire in limited contexts, usually in concert with multiple behavioral-action strands, and often involve more than a single person. This paper reviews different ways researchers have attempted to segment 'the stream of behavior' and suggests that the difficulties they have encountered call into question the appropriateness of linguistic models for more general behavioral-action analysis. For example, if there is no compelling way to analyze the behavioral stream into stable constituent units, then the metaphor of a 'cultural grammar' may be fundamentally misleading. The enduring appeal of this metaphor may be due to the fact that anthropology's end-products (ethnographic descriptions) are abstracted, linguistic renderings. Any verbal condensation of action will, inherently, sustain the illusion of regular, segmentable action sequences.

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## INTRODUCTION

The remarkable success of formal models in linguistics has depended upon being able to segment language into constituent parts, and at many levels of analysis (phone, phoneme, morpheme, lexeme, sentence). Once constituent parts are clearly identified, "grammars" can be written to describe the combinatorics of the discrete parts. The whole paradigm is remarkably similar to that of chemistry (since the development of the Periodic Chart).

My question is can anthropologists, interested in general behavior-action, follow this linguistics lead? If we can find reasonable ways to segment the behavior-action stream, then the "grammar" approach is at least plausible. So, let us examine a few of the serious attempts to segment the stream of behavior and see how these efforts have fared.

## FAMILIAR SEGMENTATIONS OF LANGUAGE AND THE GENERAL "LINGUISTICS PARADIGM"

Linguists have been remarkably successful identifying discrete segments of language and at several levels of analysis. This is not to say that *all* linguistic units or levels of analysis are crisply defined, but many are. Thus, before going on to review ways in which researchers have tried to segment behavior, let's remind ourselves of the more familiar ways in which linguists have segmented language.

***Phonological Level:***

- SPEECH SOUND = ??? not well defined ... but people seem capable of distinguishing "speech sounds" from other vocal-auditory tract noises

(- Differences between articulatory and acoustic phonetics)

- PHONE = a category of sounds identifiable by a distinctive configuration of articulatory features

- PHONEME = a category of phones, identifiable as a minimal code element in a given language, i.e., the categories of speech sounds that make a difference to speakers of the language

- Phonological Rules ... 'underlying form' --> 'surface form' of allophones in complementary distribution

- SYLLABLE = ??? not well defined ... syllable = [onset +] peak [+ coda]

'Peak' is composed of vowels or sonorants (nasals, liquids)
'Onset' is composed of any consonants that may precede the peak
'Coda' is composed of any consonants that may follow the peak

- Phonotactic Constraints ... combinatorics of permissible syllable structures in a given language

***Morpho-Lexemic Level:***

- MORPHEME = the smallest units of sound that carry meaning (i.e., that have semantic consequences)

- LEXEME [word] = ??? not well defined ... free morpheme [+ bound morpheme(s)]
e.g., "antidisestablishmentarianism" is a single word because its meaning is compositionally determined from its constituent morphemes all but one of which are bound morphemes, but "hot dog" is also a single lexeme even though its meaning is not compositionally determined from its two constituent free morphemes ... at what point do 'adjective-noun' combinations become a single lexeme?? ... is "caesar salad" a single lexeme or two lexemes??

***Sentence Level:***

- SENTENCE = referring expression (NP) + predication (VP) ??

    SYNTACTIC ROLES --> syntactic rules ... combinatorics of permissible sentence structures in a given language

    SEMANTIC ROLES ... permissible lexical insertions

Note: "...knowing a word requires having at least four kinds of information:
a. Phonological: what sounds the word contains and their sequencing
b. Semantics: the meanings of the word
c. Syntactic: what category (noun, verb, etc.) the word belongs to and how to use it in a sentence
d. Morphological: how related words, including plurals (for nouns) and past tenses (for verbs), are formed" (Finegan 1989:77).

Point: Lower-level language units (which are non-denumerable) sort of 'anticipate' their functional relations in higher-order language units, i.e., much of the schlock work of syntax is done by pushing the requisite information into "the lexicon."

***Discourse Level:***

- PRAGMATIC CATEGORIES... information structure

- SPEECH ACTS... Grice's cooperative principle, etc.

- CONVERSATIONS... turn-taking, cueing, etc.

**Importance of Segments in Linguistic Models**

- *hierarchy of segmental units* in linguistics -- *constituent structure* analysis

    e.g., phone, phoneme, morpheme, lexeme (?), sentence ... segments identifiable by their patterned recurrence AND by researchers' ability to do controlled environment experimentations (pat vs. bat) vis-a-vis a general criterion variable: 'does the meaning of $\text{Expression}_i$ change when we change part X?' [Note: some segments are more easily identified/defined than others, and supra-segmental features are relatively few.]

- *linear ordering of segments* in time ... not multiple, interlocking, semi-autonomous, and contemporaneous sequences

Thus, *finite linguistic forms* (constituent parts) give rise to *infinite expressive possibilities* (well-formed and meaningful utterances).

    **E.g., finite phonemes ==> potentially infinite morphemes/lexemes
    **E.g., finite syntactic roles ==> potentially infinite sentences

- essence of GRAMMAR idea: finite discrete segments ==> infinite generative capacity via application of recursive rules (also implies infinitely many 'impossible' combinations)
- linguistic grammar idea ==> distinction between competence and performance

'Competence' ----> infinite context-free possibilities
'Performance' ----> finite context-dependent actualities

Whole paradigm is very much like logic behind chemistry, i.e., discrete constituent parts (atoms) whose combinatorics (valence theory) produce higher level structures (molecules/compounds).

## SEGMENTATIONS OF BEHAVIOR-ACTION

### W.S. Condon & W.D. Ogston (1967) "A Segmentation of Behavior"

- purely inductive approach ... transcription of behavior, then look for natural units
- micro-analysis of filmed behavior (24 fps or 48 fps camera speeds)
- inertial change points of each body part through time PLUS phonetic transcript
- empirical findings = "process units" ... coordination of behavior-with-speech-in-time
- "self-synchrony" AND "interactional synchrony", both mediated by speech-kinesic coordination
- important conclusion = humans seem to be micro-organized at the word level, i.e., highly coordinated behavior (kinesic and speech) at this temporal level

Other relevant works of this ilk:
-- Adam Kendon (1970) "Movement Coordination in Social Interaction: Some Examples Described" ... reports that interactional may or may not occur in group interactions, and proposes interactional synchrony may underlie feelings of rapport
-- John Gatewood & Robert Rosenwein (1981) "Interactional Synchrony: Genuine or Spurious? A Critique of Recent Research" ... compares and contrasts the micro-analytic work of Condon and Kendon, and rebuts McDowall's rebuttal of their findings
-- Noa Eshkol & Abraham Wachmann (1958) Movement Notation ... goes off in slightly different direction (geometricized body), but shares idea of 'behavioral transcription'

### Roger G. Barker & Herbert F. Wright (1955) Midwest and Its Children: The Psychological Ecology of an American Town

- actones (molecular behaviors) vs. actions (molar behaviors) -- actions done by whole person, whereas actones done by sub-systems with greater or lesser independence of the person as a superordinate whole ... key is who or what does what
- "specimen record of behavior" -- observer's verbal transcription of a subject's actions and the context of these actions through a time interval ... key idea = "episodes" are the primary stuff and business of moment to moment, hour to hour social life
- identifying episodes depends on ACTION and CONTEXT IN WHICH ACTION OCCURS -- both are critical to definition of episode

- episodes are basically common sensical segmentations of behavior; although B & W's auxiliary criteria are interesting, identification of episodes in a specimen record of behavior is really based on observers' prior understandings of relevant human goals and purposes

Other relevant works of this ilk:
-- George Miller, Eugene Galanter & Karl Pribram (1960) Plans and the Structure of Behavior ... Test-Operate-Test-Exit units (TOTE)
-- Marvin Harris (1964) The Nature of Cultural Things ... actones, actonemes, episodes; criterion of environmental effect
-- Gatewood (1978) Fishing, Memory, and the Stability of Culture Complexes ... Toy 1 (natives' own verbal rendition of their job routines) and Toy 2 (necessary sequencing) depictions of 'making a set' in salmon seining
-- R.P. McDermitt, Kenneth Gospodinoff, and Jeffrey Aron (1978) "Criteria for an Ethnographically Adequate Description of Concerted Activities and Their Contexts" ... micro-analysis of school classroom dynamics

**Michael Agar (1974) "Talking about Doing: Lexicon and Event" AND (1975) "Cognition and Events"**

- straightforwardly linguistic segmentation of action
- case grammar (verb-based) analysis of addicts 'getting off'
- set inclusion of verbs defines a major action and its sequential sub-stages
- verb's case frame specifies the optional and obligatory noun slots that are filled in sentences containing the verb and the type of relationship (semantic roles) that the nouns have to the verb, e.g., agent, object, instrument, location, result
- POINT = ways of talking about doing indicate the IMPORTANT segmentations of action (important to natives)

Other relevant works of this ilk:
-- Eleanor Dougherty (1979) "Segmenting the Behavior Stream: Verbal Reports as Data" ... uses both spontaneous verbalizations accompanying actions and ex post facto discussion of video-taped action

**Roger Keesing (1971) "Formalization and the Construction of Ethnographies"**

- objective is to formulate 'culture grammars' (schemata) for limited domains, e.g., "Our purpose is neither to describe what has happened nor to predict what will happen, but to set forth what one needs to know in order to make sense of what does happen" (Frake 1975:25).
- highly deductive approach, i.e., already "know" what the action segments are, just concerned with their sequential and conditional relations
- human goals/purposes identify the limited domain of activity, which is then broken down into various possible action sequences ... if-then chains
- alternative outcomes are usually focus of interest, and these depend on attribute variables describing the actor and/or strategic interaction with another actor

- ‘decision points’ accomplish a de facto behavioral segmentation, an interpretive road map of what’s going on, e.g., ‘where in the flow diagram of a social process are we now’

Other relevant works of this ilk:
-- Anthony Wallace (1965) “Driving to Work” ... general knowledge and personally formulated rules for driving his car; image is of human as cybernetic machine
-- Robbins Burling (1969) “Linguistics and Ethnographic Description” ... rules of household composition
-- Charles Frake (1975) “How to Enter a Yakan House” ... spatial transitions contingent on individual’s status and messages exchanged between host and visitor

## CONCLUDING REMARKS

Inductive search for low-level behavioral units (temporally comparable to phones and phonemes) has *not* identified stable, replicable entities, but rather merely documented the rich coordination of behavior occurring at sub-second time frames. The micro-segmentations of behavior have NOT yielded a ‘periodic chart’ of stable entities that become ‘constituent structures’ for higher-order behaviors. Hence, we do *not* find the linguistic paradigm (combinatorics of finite elements) in play.

Deductive behavioral-action analyses of limited domains are formally most similar to the linguistic paradigm. But all these start with some a priori, intuitively determined, or ad hoc set of ‘human goals/purposes,’ and do not demonstrate or really argue that the segmentation itself is empirically based. Further, there is little sense of what scale the action units correspond to in language. For example, does “getting married” correspond to morpheme, word, sentence, discourse, or conversation levels of language?

In short, behavioral-action analyses have not yielded a clear hierarchy of interrelated levels of analysis in which lower-level units combine in rule-governed ways to constitute higher-level units, and so on. And, even those higher level, deductive analyses of behavior that explicitly adopt the rhetoric of linguistics have as their starting point human intentions. Note the irony here. The big divide in linguistics between Chomsky’s competence and performance rests precisely on distinguishing what is possible to say from what may be appropriate or inappropriate to say in a given speech situation. Yet, the anthropologists who borrow most from the linguistic competence paradigm generally focus precisely on *appropriate* behaviors in a given context. This would be like a linguist, who wants to write a grammar for Language X, starting the inquiry by cataloging the communicative intents of speakers saying particular things in particular contexts, then noting classes of linguistic forms that accomplish these objectives. In linguistics, this approach leads to speech act theory and pragmatics, not to formal grammars of linguistic competence.

Why, then, is the ‘cultural grammar’ notion so enduringly appealing? Perhaps its appeal is due to the fact that anthropology’s end-products (ethnographic descriptions) are themselves abstracted, linguistic renderings. And, as any verbal condensation of action will, inherently, sustain the illusion of regular, segmentable action sequences, the very language we use when describing

what people do lulls us into a misguided complacency, glossing over the formidable difficulties involved in more serious efforts to segment the stream of behavior.

In conclusion, and going a bit beyond what I've said above, let me end by simply proclaiming that there is no periodic chart for culture, no foundational level of discrete and stable parts from which higher order structures are constituted. If this is the true nature of our beast, then the powerful combinatorics paradigm of chemistry and linguistics will be of little value to us. We need instead quite different paradigms for dealing with the essential non-discreteness of human behavior. 'Chunky-sort-click' formalisms will just not work (Gatewood 1978; 1985). Combinatoric orderings of non-discrete entities is a misguided undertaking.

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