

PRESIDENTIAL ADDRESS: THE BOUNDARY QUESTION*

MICHAEL SHAPIRO
Brown University

David Savan in memoriam

1 Introduction

When I was growing up in Japan right after the war, I used to listen to recreations of major league baseball games over the Armed Forces Radio Network. My favorite team was the Boston Red Sox, and my hero was Ted Williams ("The Splendid Splinter"). Since the Red Sox were (and are) in the American League, they often played the Detroit Tigers (also in the AL), who had an outfielder named Hoot Evers (his real first name was Walter). Anyway, until I started reading the *Stars and Stripes* and the *Japan Times*, I thought this player's name was Hoo Devers. My mistake was based on interpreting the alveolar flap realization of /t/, i.e.,

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[D], as belonging to the last name rather than the first. (This is the sound that occurs in American English intervocalically, neutralizing the distinction in normal [informal, unemphatic] speech for many speakers between, e.g., *utter* and *udder*). But more fundamentally, of course, I had imposed an incorrect segmentation on the sequence involving the alveolar flap, having placed the word boundary before rather than after it. In linguistics the traditional designation for this phenomenon is metanalysis, by which is meant any boundary shift.

One very important thing about boundaries is that they are purely mental entities.¹ Physical boundaries, like lines in the sand, barriers, or any sort of markers, are dependent for their status on a stipulation of purpose (convention). This means that whatever we customarily regard to be “natural” boundaries are really dependent on a rule of interpretation. Aside from this and more generally, we perceive things as distinct partly because we implicitly or explicitly perceive their extent, their boundedness; that is what makes them distinct and differentiates them, whatever other features they may have. It is in this primitive sense that mathematicians speak of boundaries or limits, including the boundedness of space. The relation of biuniqueness or reciprocal implicature obtains between boundedness and distinctness. Anything that is distinct is necessarily bounded; conversely, anything bounded is necessarily distinct.

In language and culture we infer the existence of boundaries on the basis of the effects that can be attributed to them. In the case of a word boundary, the most general effect is, of course, that the word is rendered distinct as such, guaranteed its integrity as a unit. This idea or function is embodied, for instance, in the etymology of the word *definite* (ultimately from Latin *de-* ‘away, from’ + *finis* ‘boundary, end’). In the case of my youthful aural mistake, the analysis comes down to saying that I relocated the boundary in such a way as to change the phonological composition of the words, misinterpreting Hoot as Hoo and Evers as Devers.

I mention this nonce example of metanalysis not only by way of introducing the topic of boundaries but as a clear example of what is involved semiotically in the subject. For this purpose linguistic examples are a reliable starting point because the data and the methods are basically well known and empirically tested. I will now expand the discussion to show that metanalysis, far from being an episodic phenomenon limited to individual misinterpretations, is actually a fairly common fact of attested linguistic

change, of language history. And later my treatment of linguistic boundaries will demonstrate—at least implicitly—the structural isomorphism of all the levels of language with each other, from the lowest phonological level to the highest level of syntax and discourse, by which is meant the fundamental idea (first propagated by Hjelmslev and Jakobson) that the rules of organization governing all these levels are of the same form.

In early Middle English, for instance,² the word **cheris* ‘cherries’ was used as a collective singular but came to be interpreted as a plural *cheri-s*, with a morpheme boundary between the stem and the *-s*, the latter now interpreted as the plural ending. This new segmentation, with its establishment of a constituent structure where none existed before, gave rise in turn to the creation of a new singular *cheri* ‘cherry’, and *cheris* ‘cherries’ came to be used with plural verbs. Examples like this exist in the history of every language.

Let me mention one other general property of boundaries. Again, I will try to make a conceptual point by recurring to linguistic examples. In English, the word family *bind*, *band*, *bound*, *boundary*, *bond* presents an interesting set of meanings that—at the margins—seem to be at odds with each other. On one hand, there is the meaning of joining (or being joined) as in *bind*, *bound*, *band*, and *bond*. On the other hand, there is the antonymous sense of separating as in *bounded* and *boundary*. One is reminded of the notorious *cleave*, cf. *cleft palate* or *cloven hoof* with the biblical *cleave unto*, etc. (even though they turn out to be etymologically distinct in Old English). A similar case arises in comparing the meanings of *join* and *joint*. A joint is something that both separates and binds together.

What such extreme cases show is an important peculiarity of anything that is unified (like a structure, for instance). To be unified or structured—whatever else is true—means necessarily to have internal differentiation; in other words, a structure is a whole constituted by (disparate) parts. Unified entities such as structures are also continuities.

A continuity is a whole whose parts are interrelated, which is to say that a continuity is constituted by both part/part and part/whole relations. Something that is continuous but without parts is a mathematical and physical possibility but occurs in language and culture only at some incipient, preliminary, or undefined stage of semiotic development. It seems that the human cognitive capacity is unable to operate except by grading and ranking continua.

The most fundamental continuum in language is a gestalt called a syntagm. Syntagms are wholes consisting of parts organized hierarchically. They can be either sequential or simultaneous. In a sequential syntagm, the constituent parts are realized linearly—in time or in space. A sequential syntagm in language is any stretch of linguistic units (including words) connected with each other in relations of sub- or superordination. Thus, for example, any syllable is a sequential syntagm; any morpheme is a sequential syntagm; any coordinate construction, any adjectival phrase, any prepositional phrase is a sequential syntagm.

But besides sequential syntagms there are also simultaneous syntagms, a cardinal fact Saussure and many later structuralists failed to realize (their error is perpetuated in the use of “syntagmatic” to mean only “linear”). These are gestalts constituted by parts that, rather than being arranged linearly, cooccur, so to speak, columnarly, in hierarchical continua. They are structured wholes or units that are internally differentiated.

The most fundamental such simultaneous syntagm in semiosis is the minimal linguistic gestalt—the phoneme (cf. Andersen 1979). Every phoneme is a structure constituted by phonological signs—distinctive feature values—that are realized simultaneously. For instance, the initial /b/ of *bell* is made up of a syntagm of feature values, each of which is a sign: – vocalic, + consonantal, + voiced, – nasal, – compact, – continuant, – strident, in that order. A phoneme, therefore, is a semiotic gestalt—a hierarchy—defined as a syntagm of phonological signs which cooccur in rank relations vis-à-vis each other. In the case of English /b/, the value – vocalic is superordinate to + consonantal because English, with its large and complex inventory of vowels (notably including diphthongs), is a vocalic language—unlike Russian, for example, which is a consonantal language; in Russian + consonantal is superordinate to – vocalic in the distinctive feature hierarchy (cf. Andersen 1978).

One important property of phonemes is that none of their constituents can occur singly; phonological distinctive feature values necessarily occur jointly. The parallel situation in the rest of grammar is provided by bound forms, like endings or prefixes, that cannot occur by themselves and must always be attached to a stem.

Simultaneous syntagms are not limited to the level of signantia, or phonological signs. Signata, or meanings, are also organized into gestalts or syntagms in which the constituents are hierarchi-

cally organized. With regard to grammatical meanings (like case, number, gender, tense, person, etc.), a signatum may have a unitary structure, i.e., be constituted by one and only one meaning, which is usually the grammatical feature value of the category in question. In the Indo-European pattern, for instance, the modern daughter languages typically display what is called syncretism, i.e., they incorporate several grammatical content forms (signata) in one expression form. An ending that does this is called synthetic. Thus Latin *am-ō* 'I love' consists of a stem and an ending (*am-* and *-ō*) where the *-ō* expresses the categories of person and number simultaneously.

In the more familiar domain of lexical semantics, this simultaneous copresence of several meanings—several signata—within one simultaneous syntagm occurs practically without fail. Any dictionary entry reveals multiple senses that are listed in some order, usually starting with something like the primary or literal and proceeding through an array of secondary or transferred meanings (connotations). Dictionaries tend to register figurative meanings only when these have been codified, leaving the tropological potential of a living language largely untouched.

Parenthetically, it is precisely the arena of semantic transference that lends itself so neatly to illustrating the general problem of simultaneous syntagms. In the two master tropes, metonymy and metaphor, the hierarchical relation between the literal and figurative signata of each is at the heart of the transferred meaning that characterizes them.

Beyond the simple function of delimiting domains, including syntagms, is there something about the behavior of boundaries that affects the character of semiosis? Staying with language structure for the moment, let us look at the more familiar type of syntagm, the sequential or linear one. In a coordinate construction like *you and I/me*, the choice between subjective vs. objective case in the first person pronoun form depends on the syntactic position of the phrase. In formal English, it is *you and I* in subject position and *you and me* in all others. In colloquial English *you and me* can occur in subject position, with the marked form *I* being replaced by the unmarked *me*.

But increasingly in both spoken and written varieties, especially in America but not only, one hears the subjective case pronoun form replacing the standard objective case form in coordinate constructions. For example, a few months ago [May 24, 1993] I heard the following sentence from a commentator on the National

Public Radio program "Morning Edition," in a lame attempt at humor, admitting to the program's host his inability to predict the winner of the doubles competition in the French Open Tennis Championships: "I'm picking you and I."

This jarring solecism is more often to be found after prepositions, e.g. *between you and I*, etc. The substitution of I for me here is what is usually called a hyperurbanism (hypercorrection), meaning the use of the wrong form as a result of the speaker's wishing to sound educated. However, I would like to explore the possibility that there is a deeper reason for this substitution, and to propose a different interpretation, one that relies on an understanding of metanalysis or boundary shift.

First a short description of the grammatical facts. When grammatical government is involved, as it is in *between you and I/me*, the normal domain of the preposition extends to each constituent in the complement, as it does to the direct object of the verb in *picking you and me*. Thus whether there is a preposition preceding the coordinate phrase or not, the form of all constituents in the complement should be in the objective case. The second person pronoun *you* is syncretic; it does not differentiate the subjective from the objective form, but the first person does. Why do some speakers place the subjective form *I* in objective position?

The first thing to point out is the fact of a coordinate construction. We are dealing here not with a simple complement but a compound. Even in nonstandard American English there are no attested instances of sentences like **He picks I* or **She talks to I* (although British dialects do have them). So the compound character of the complement is evidently a necessary precondition for the possible hyperurbanism to occur.

Now, one property of a unit, as we established earlier, is its boundedness. In a compound unit, the boundaries envelop all of the constituents; otherwise, the compound would lose its character as a unit. In other words, disregarding the conjunction, a coordinate phrase of the type *you and I* is bracketed [you and I] rather than [you] and [I]; it has only two major boundaries, at the two margins of the construction, rather than six minor boundaries—the number it would have if it were simply the additive product of two personal pronouns separated by a conjunction. In the solecistic construction, the individual constituents inside the brackets/boundaries that enclose the compound seem to be insulated from case government. They undergo no change, even while being syntactically liable to it, apparently because compounds of this

type are analyzed by speakers who utter these solecisms as being unitary, undifferentiated gestalts. Such speakers ignore the internal noun phrase boundaries, assigning case only to the whole compound noun phrase. In standard American English, by contrast, the boundaries are observed, and each constituent receives its appropriate morphological inflection.

The grammatical solecism can thus be understood as the effect of boundaries being suppressed, specifically the minor boundaries around the pronouns. (This might also explain why solecisms like **to he and I* are heard, but not **to him and I*.)

Not that the boundaries on either side of the individual constituents cease to exist just because the coordinate construction has boundaries enclosing it. Not at all. Here we have an example of the variable strengths of boundaries. In the hierarchy of boundaries involved in the phrase, the supervening compound boundary is the major or salient one, while the remaining minor ones are present but not germane.

The differential strength of linguistic boundaries is actually a well known fact. Languages vary in the value they attach to particular boundaries, so that, for instance, common phenomena like phonetic assimilation may or may not take place at exactly the same boundaries in different (even related) languages.

The relative instability of boundaries has already been touched upon indirectly with the introduction of metanalysis. Now I would like to offer some further examples of boundary shifts in order to show how the simultaneous syntagm and its boundary are interconnected; also how a change in meaning can be attributed to a boundary shift. The sorts of changes I want to consider can all be put under the traditional category of PLEONASM. This term, however, has never before been understood as involving metanalyses.

The meaning of the intransitive verb *continue* clearly involves the idea of duration beyond a given point. This can also be seen in the synonymous compound verb *go on*, where the postposition on makes the semantics explicit. In the recent history of American English, *continue* has come increasingly to be used pleonastically, with the postposition *on*. A fairly routine analysis of something like this would make appeal to analogy, saying that the variant *continue on* has come into the language by analogy with *go on*, which has the same general meaning. But analogy does not explain the pleonasm. And here we have a case of metanalysis that is actually obscured by appealing to analogy.

The meaning represented by the postposition *on* is already contained in the simultaneous syntagm of continue. The neologism *continue on* results from altering the extent of the boundaries that define this syntagm: the syntagm is partly “unpacked,” so to speak, with one element, namely *on*, moving from simultaneity to sequentiality. The linearization of the postposition is, in other words, concomitant with a boundary shift. Here the boundary has shifted rightwards, but it can also shift to the left. Take the fairly common solecism *equally as*, occurring in written as well as spoken American English instead of *as*. The meaning of semantic equivalence is already contained in the conjunction *as*; *equally as* pleonastically expresses this meaning by “unpacking” it from the simultaneous syntagm of *as* and linearizing it alongside as. Again, in the process, a boundary has shifted.

This kind of shift may also explain a bizarre syntactic phenomenon that is quite prevalent in spoken American English. I have in mind the reduplicative copula in *is that* constructions, e.g., *The problem is is that*, *The reason is is that*, *my guess is is that*, etc. Hillary Clinton, believe it or not, even used it in a speech to the American Hospital Association (excerpt televised by CNN on its “Early Prime” news broadcast, August 9, 1993): “The ratio is is that . . .” Could this be emphatic? Is it just a so-called hesitation phenomenon, a vagary of performance, where the speaker isn’t sure what they will assert in the rest of the sentence?

Perhaps we should regard it as a pleonasm, which, of course, is a kind of repetition. But the advantage of changing perspectives becomes clear when we also adopt the corollary position of interpreting copula reduplication as a concomitant of a boundary shift. The situation is more complex than in our previous examples. Perhaps what we have here is the linearization of the redundant existential meaning that inheres in the simultaneous semantic syntagm of every topic word. The nouns *problem*, *reason*, and *guess* contain within their syntagms of signata the meaning of existing—albeit redundantly. The non-standard construction *X is is that Y* can be interpreted as being the product of the “unpacking” of the simultaneous syntagm of the topic word *X*: the once covert existential copula is linearized immediately following the topic word, a process accompanied by a shift in the boundary of the relevant syntagm.

But this interpretation also raises an important issue: why should boundaries shift at all? What is it about the content and/or the form of the linguistic material that would trigger metanalysis?

To answer this question we have to remember the most fundamental fact about boundaries after their status as purely mental entities: their instability. Ranking (hierarchization)—also a purely mental operation—and segmentation are the two most unstable semiotic processes in both human learning strategies and human historical development. The content values of semiotic units are relatively easy to learn and to transmit, but learning and perpetuating how to rank them and where to draw the boundaries between these units is more difficult and hence more liable to error or misinterpretation.

Because both the establishment of rank relations and of boundaries are so prone to be misinterpreted, innovations with respect to these two types of semiotic processes can be understood as arising from their purely mental character and their resultant instability.

2 Effects of boundaries

The most straightforward application of the boundary concept is in the observation that boundaries have effects. In the political life of nations, for instance, we know that a border is not merely a line on a map which demarcates the territory of a given state from contiguous ones. A border is also a barrier: it has the consequence of marking the line or limit beyond which persons and things cannot cross without license to do so; or lacking the latter, without incurring certain penalties. As a fact of political geography, a border must have physical properties in itself for it to be effective, including border guards and material installations which make trespass difficult and hazardous.

Such examples of boundaries, where the stipulative aspect of a boundary's effect is materially incorporated in a physical object (like a fence or wall) that acts as a barrier, are actually in the minority. By far the most usual implementation of the boundary concept is the one embedded in the concept of penalties incurred by the violation of a boundary. This understanding is, of course, the one that is central to any system of norms, including ethics and jurisprudence.

The use of the word penalty, however, obscures an absolutely fundamental formal characteristic of situations involving boundaries: the dominance of the negative. To be sure, norms whose violation does not trigger penalties run the risk of being purely paper restrictions—and ultimately, of becoming extinct. But

whether normative statements are cast negatively or affirmatively, it is the negative that is fundamental both to the ontology of norms and to their practical consequences. (It is no accident that the Ten Commandments are predominantly of the form "Thou shalt not . . .").³

The negative has, of course, been recognized for its definitional role in the history of logic, as epitomized, for example, in Spinoza's dictum *omnis determinatio est negatio*. A norm remains implicit until violated, until the boundary separating normative from non-normative behavior is crossed. The negative is thus at the foundation of all rules of conduct, and to the extent that conduct is a semiotic matter, the negative is thereby fundamental to semiosis.

In linguistic semiosis, however, the presence of boundaries is to be recognized not by instances of their violation but by their effects on linguistic form. The first such effect is simply the delimitation of a linguistic domain, which is to say that a linguistic rule always contains some reference to the context of its application, whether that context is simultaneous or sequential. For instance, in Russian a voiced obstruent is replaced by its voiceless counterpart in word-final position before pause and before sonorants (vowels, liquids, nasals, glides). This means that the distinctive feature of voicing is neutralized (suspended) in these contexts. Word-internally, however, voiced consonants before sonorants are distinguished from voiceless. The specification of the domain is essential to the form of both the rule and the linguistic result. In such cases, the phonological boundary is said to have an effect—conditioning the neutralization of voicing in the domain delimited by the boundary.

From a semiotic point of view, such phonological rules have the function of promoting textual cohesion.⁴ This semiotic function is accomplished by having rules which produce signs of cohesion by applying to environments which include reference to the boundaries of phonological or syntactic constituents. A neutralization rule like the Russian one is like any rule of the general form $X \rightarrow Y/Z$ (X is realized as Y in the environment Z) in that it establishes a sign, Y , which at one and the same time represents X and Z . While standing for X , it simultaneously points to Z by virtue of its reference to Z . Y is thus an index of Z .

The boundary delimiting the domain of the rule is clearly essential to the rule's semiotic functioning. Indexing a phonological or syntactic domain cannot proceed without boundaries.

However, the process of textual cohesion, as the word "cohesion" connotes, includes both the binding and the separating function of boundaries.

There are three aspects of cohesion that can be discriminated by the functions of rules and the varying strengths of boundaries included in their definitions. The three aspects or functions can be called integrative, concatenative, and delimitative. First, rules that apply within a domain irrespective of boundaries within this domain serve an integrative function. They produce signs of internal cohesion of the given domain. Second, rules that apply at boundaries may serve a concatenative function if they produce signs that link elements across the given boundary. Finally, they may have a delimitative function if they produce signs that do not link elements across boundaries.

A simple example of the integrative function in phonology is the so-called reduction of vowels in Russian, by which vowel distinctions are neutralized in unstressed syllables within the word irrespective of internal boundaries. Hungarian vowel harmony, by contrast, which links morpheme to morpheme within the word, is produced by rules with a concatenative function. Finally, the devoicing rule of Russian which signals the margins (left or right) of words may be said to serve a delimitative function.⁵

3 Boundaries and hierarchies

Because boundaries and hierarchies are both purely mental entities and have in common the property of instability, it is natural to ask the question, whether boundaries play a role in the establishment or alteration of hierarchies. In sequential syntagms constituted by parts in rank relations to each other and to the syntagm as a whole, examining instances of change (rehierarchization) can perhaps clarify this question for us. For instance, in compounds like *boatswain* or *waistcoat* the traditional pronunciations [bóʊsn̩] and [wɛskɪt] reflect the fact that the constituent structure preserved in contemporary orthography refers to the compounds' origin; but more importantly, that this structure was superseded in the history of English by the words as wholes. Put another way, the whole acquired a phonetic realization that underscored its superordinate status vis-à-vis its parts. In the process—and this is what concerns us primarily—the boundaries separating the constituents (*boat* + *swain*, *waist* + *coat*)—were erased, as a precondition or concomitant of the several reductions

these compounds evidently underwent. (The traditional pronunciations of these items are being replaced by spelling pronunciations, which have the effect of reintroducing the etymological boundaries.)

The reverse directionality is observable in the folk etymologization of the word *asparagus* to *sparrow grass*: clearly, the latter involves a metanalysis—in this case, the establishment of a boundary where none existed before—that accompanies the change from a word with no constituent structure into a compound (cf. Anttila 1985: 6 ff.). Here, the parts are rendered equivalent to the whole as the boundary is established between them. Because it is a compound, of course, the whole is not equal to the sum of its parts, but that is not germane to the question.

Both sets of examples involve a rehierarchyization. And since both involve a change in boundaries, one is left with the idea that, at least provisionally, we should consider whether (re)hierarchization does not always proceed with an obligatory metanalysis.

And what about simultaneous syntagms? There ought to be a structural parallelism (isomorphism) between sequential and simultaneous syntagms with respect to the role of boundaries. Because of their simplicity, tropes are useful semantic structures to experiment with as diagnostics in trying to clarify this problem. A metonymy or a metaphor that is fresh (i.e., has not lost its figurative force) always involves the hierarchyization of two signata in a simultaneous syntagm, the literal and the figural meanings. In fact, for the trope to exist as such the literal has to be subordinated to the figural meaning. In a metonymy like *pars pro toto* (synecdoche), say Homer's thirty sails for ships, there is an inclusion relation between tenor and vehicle. But beyond that, as with any trope, there has to be a negation involved in the meaning complex (the "figural situation"), a negative which assures that the literal not be taken literally but figuratively. In the case of a synecdoche, the negative has an attenuated force because of the inclusion relation: a sail is not a ship but is still a part of it. But in a case of pure metonymy (spatial or temporal contiguity rather than inclusion), the negational quotient is evident in full force. For instance,⁶ in the history of English the word *bead* (from Middle English *bede* 'prayer') is the result of a metonymic shift associated with equivocal collocations like *counting one's beads*, meaning 'prayers' or 'tokens of prayers in a rosary'. In the original change from 'prayer' to 'bead' the semantic permutation necessarily incorporates the meaning 'NOT'—here 'bead NOT prayer'—as long as the real-life

connection between the two meanings is alive. (Once it has been collectively forgotten, the trope fades and loses its figurality.)

This 'NOT' is the boundary in a simultaneous syntagm that is exactly parallel to the linear boundary necessarily present in a sequential syntagm. In a simultaneous syntagm, the set of rank relations is always the cumulative result (gestalt, continuum) of pairwise comparisons; this is illustrated straightforwardly in the example of a trope, but any such hypotactic syntagm will serve equally well. In a phoneme, every distinctive feature value is ranked vis-à-vis its closest related feature in the first instance, and only secondarily in relation to other features. These pairings of related features are natural in that they share both formal and substantive properties.

Another useful parallelism illuminating the semiotic affinity of the negative with boundaries is the one provided by the meaning of the minimal phonological sign (i.e., a term of a phonological opposition). This sign is negative, oppositive, and relative. In saying negative, one highlights, with Saussure, the purely differential character of phonological distinctive features: they are the only signs in human semiosis with no positive meaning of their own, the signatum (object) of every phonological signans (sign) being 'otherness' or 'alterity'. But this aspect of the negative pertains to the paradigmatic relations contracted by phonological signs. The structural analogue of the paradigmatic negative in the syntagmatic relations of phonological sign complexes is hierarchy (rank, hypotaxis). Simultaneous syntagms in phonology—phonemes—are also negative, relative, and oppositive. But while they derive their relativity (asymmetry) and their oppositiveness (semiotic breadth) directly from their immediate constituents, the phonological signs composing them, their negativity is not derived in that way. The negative character of these simultaneous syntagms is a primary feature of their being hierarchical gestalts.

The frequent mention of gestalts should alert one to the possibility that a field-theoretic view of structure is behind this concept.⁷ Indeed, when it comes to simultaneous syntagms, we are clearly dealing with fields—in the case of the phoneme, with the ultimate field phenomenon of human semiosis. Hierarchical salience, for instance in the structure of tropes, is definitely a field phenomenon; its effects are best captured visually in a diagram using so-called peak notation (Anttila 1992: 35). The salient element here is the figural meaning, which can only appear against the background of the literal meaning. There is a kind of

stereoscopic effect to such structures, in alignment with their simultaneousness, and corresponding to their semiotic depth.

Salience is a type of rank relation and, therefore, necessarily means the presence of hierarchy. Hierarchy, in turn, is the form of syntagmatic asymmetry whose paradigmatic counterpart is markedness. Both aspects of asymmetry pertain to the relativity of the two basic structures, syntagms and paradigms, into which human semiosis is organized. Moreover, in Peircean terms hierarchy and markedness are species of logical interpretants, or Thirds. Wherever there is choice in semiosis, i.e., wherever neither the order nor the value of semiotic elements is rigid, hierarchy and markedness are present in the operation of signs.

In human semiosis both of these interpretants are purely mental, just like boundaries, and they share with boundaries the instability noted earlier. Hierarchy and markedness are both highly dependent on context, which means that there are relatively few universals pertaining to these two asymmetries.

Markedness and hierarchy are also value concepts. It is illuminating to explore the consequences of markedness as a formal universal in semiosis, with emphasis on relational structure.⁸ In logic two kinds of relations have traditionally been recognized, both of which can be called exclusive and contrasted with the inclusive relations that define markedness: the oppositions of contraries (A vs. B) and contradictories (A vs. non-A). These relations are exclusive in the sense that the reference potential of each term excludes its opposite. (Note that the negative always overtly includes, or makes reference to, the positive, but the converse does not hold.)

In language and culture, however, the main type of relations is what Hjelmslev called "participative relations" (i.e., inclusive relations), in the sense that all oppositions in language "are subject to the law of participation: there are no oppositions between A and non-A, but only between A on one hand and A + non-A on the other" (Hjelmslev 1935: 102; cit. Andersen 1989: 18). For instance, it is because the reference potential or breadth of a word like *goose* includes both 'gander' and 'non-gander' that *goose* can be used to refer to 'male goose', 'female goose', and 'goose regardless of sex'. Participation is an inclusive relation inasmuch as the reference potential of one term includes that of the other.

Hjelmslev actually went beyond clarifying the difference between participative oppositions and the contradictory and con-

trary ones of traditional logic. He recognized that "exclusion is merely a special case of participation, in which certain slots [Fr. *cases*] of the extensive [i.e., unmarked] term are empty" (1939: 87; cit Andersen 1989: 18). This crucially important insight cannot be documented here; suffice it to say there are linguistic data that confirm Hjelmslev's claim that inclusive relations are the superordinate type to which the diverse exclusive relations are subordinate. This is another way of saying that the main types of semantic oppositions all fall under the law of participation: contraries (e.g., 'sweet' :: 'bitter'), contradictories (e.g., 'straight' :: 'bent'), converses (e.g., 'parent' :: 'child'), directionalities (e.g., 'up' :: 'down'), and complementarities (e.g., 'male' :: 'female').

Logically diverse relations in meaning are conjoined in language with inclusive relations in value. According to Hjelmslev's insight, value relations obtain independently of the semantic relations; indeed, value relations hold even where, for semantic reasons, a part of the reference potential associated with the unmarked term of an opposition cannot be realized.

It is fruitful to compare the distinction between the inclusion relations of markedness (the implied, generic character of the unmarked term and the implying, specific character of the marked term) with the familiar figure/ground distinction of Gestalt psychology. In visual perception the ground includes the figure, but figure and ground are experienced as contradictories. In the framing of linguistic oppositions, there is an initial division of an experiential dimension into a salient, delimited area and a less salient, unbounded one which includes it. Only subsequently is there an identification of the functional character of their relation, which may be inclusive or exclusive, and if exclusive, contrary, contradictory, converse, etc.

This interpretation is close to Lévy-Bruhl's notion of participative relations as this idea was exploited by Hjelmslev to account for the paradoxical conjunction in grammatical oppositions (as of number, tense, etc.) of logically diverse relations in meaning with inclusive relations in value (cf. Andersen 1989: 18). But instead of taking this to be the imprint in language of a pre-logical mentality, as was suggested by Lévy-Bruhl, we should rather see in the ubiquitousness of markedness the effect of a cognitive strategy which takes precedence, ontogenetically, over the functional (and logical) analysis of the experiential dimensions encoded in language and culture (cf. Andersen 1989: 39).

What this means is that the inclusive relations which this cognitive strategy imposes on all experiential dimensions are apparently not superseded by the results of later cognitive activity. Markedness persists as a formal semiotic universal.

The relations between signata in the minimal semantic syntagm represented by a trope are analogous to the relations between figure and ground, except that the values of the terms are reversed. The figural signatum includes the literal, as the ground includes the figure. The two signata are, however, perceived as contradictions, again parallel to the figure/ground case. The way we can ascertain that there is a boundary separating the signata, apart from the fact of their distinctness, is to observe what happens when a trope fades and disappears. When ME *bede* changed from 'prayer' to 'bead', initially it was a metonymic shift, whereby both meanings coexisted. Once the meaning of 'prayer' faded, because Germanic *bede* was replaced by Romance prayer, there ceased to be the distinction between figural and literal, and *bead* was terminologized.

We can construe this process as being attended by a removal of the boundary between figural and literal when we identify it as a neutralization. A neutralization necessarily involves the suspension of the distinction between two opposed terms, with only one of the two appearing in the so-called position of neutralization as the representative of the opposition to the exclusion of the other term. When the domain is a hierarchy, neutralization means the collapse of rank distinctions; the outcome of this collapse as it affects the lexicon is one of two events or both: 1) the literal and the figural meanings go their separate ways, with the formerly figural meaning becoming independent, even terminologized; 2) the formerly literal meaning fades and eventually drops out of the lexicon. The second outcome is what happened with *bede* 'prayer'. The first can be illustrated by a word like *hand*, in its sense of 'worker'. When the transferred meaning of this word first arose, it was clearly a trope, but today it is independent.

This sort of development argues for the presence of a boundary between the two copresent signata of a trope. The hierarchical relation that necessarily obtains between the figural and literal meanings is not merely a matter of valuation but of segmentation, too. As I argued earlier, the inherent negation in the structural relation between the two signata of a trope, the exclusive relation (figural, NOT literal) undergirding the inclusive one is tantamount to a boundary.

There is an interesting congruence between this way of thinking about simultaneous syntagms and the general characterization of continuity in Peirce. Speaking of topological space, Peirce qualifies it as continuous in the event it meets either of two conditions: it must return to itself or contain its own limits. If it is "unbroken," it must return to itself; if it has limits, such limits represent a breach of continuity, manifested as "topical singularities" of a lower dimensionality than that of the continuum itself. In two-dimensional space the limits can be either points or lines. In the case of a line, the topical singularity is itself continuous, but it is a continuum of a lower dimensionality than that of the space that contains it: "so space presents points, lines, surfaces, and solids, each generated by the motion of a place of lower dimensionality and the limit of a place of next higher dimensionality" (CP 1.501).⁹

In this manner a whole series of continua of varying dimensionalities can be envisaged, embedded within one another, with any continuum of N dimensions having as its limit, in the form of a topical singularity, a continuum of not more than $N - 1$ dimensions. Dimensionality, then, is conceived as a topological characteristic of continua.

Applying these topological ideas to the analysis of the hierarchical structure of simultaneous syntagms in semiosis, we can identify syntagms with continua and rank relations with dimensionalities. (This matches, in a shorthand version, some of Kenneth Pike's main ideas about language structure.) The segmentation of the continuum into elements that are organized hierarchically is attended by boundaries between them, corresponding to the idea of limits in topological space.

Language and culture are organized into continua that illustrate Aristotle's conception of a continuum as containing its own limits. Every element of a syntagm is to varying extents both distinct (bounded) and conjoined with every other. (In "The Law of Mind" [1892] Peirce uses the example of a surface that is part red and part blue and asks the question, "What, then, is the color of the boundary line between the red and the blue?" [CP 6.126]. His answer is "half red and half blue.") With this understanding we are returned to the position enunciated at the outset that the wholes (continua, *gestalts*) of human semiosis are simultaneously differentiated and unified.

But perhaps the question we need to ask really is: what is simultaneity as such? And more precisely: does simultaneity have parts? We know that in visual perception the parts of a whole

(gestalt) are presented simultaneously and can be apperceived totally, severally, or serially, depending on the particular focus prompted by interest and attention. But in non-spatial terms, again, is simultaneity as such stratifiable into levels or components?

One of the examples Peirce cites by way of exploring the relation between time and continuity suggests a positive answer. In "The Law of Mind" Peirce says: "what is present to the mind at any ordinary instant, is what is present during a moment in which that instant occurs. Thus, the present is half past and half to come." ^{^ CP 6.126} This idea about time is congruent with his fundamentally Aristotelian position concerning the properties of a line—which for Peirce was any line, not necessarily a straight line, and for Aristotle an irreducible geometrical object. Thus if a line is divided into two halves, called line intervals, then the endpoints of both segments are loci; and "a line interval by the mere fact of existing as a line interval 'defines,' as it were, its endpoints. They are abstract properties of the line interval itself, and the notion of a line interval with no endpoints is senseless" (Ketner & Putnam in Peirce 1992: 40). When the original line is reconstituted, the two middle endpoints once again coincide at the point of division as one point. This point which is capable of splitting into two corresponds exactly to the moment of the present that is simultaneously half past and half future.

We can perhaps get a firmer grasp on the nature of simultaneity by looking at the continuum from a slightly different point of view, suggested by another of Peirce's examples (from his eighth and final Cambridge Conferences Lecture of 1898, "The Logic of Continuity"), which deserves to be cited in full (Peirce 1992: 261–2):

Let the clean blackboard be a sort of Diagram of the original vague potentiality, or at any rate of some early stage of its determination. This is something more than a figure of speech; for after all continuity is generality. This blackboard is a continuum of two dimensions, while that which it stands for is a continuum of some indefinite multitude of dimensions. This blackboard is a continuum of possible points; while there is a continuum of possible dimensions of quality, or is a continuum of possible dimensions of a continuum of possible dimensions of quality or something of that sort. There are no points on this blackboard. There are no dimensions in that continuum. I draw a chalk line on the board. This discontinuity is one of those brute acts by which alone the original

vagueness could have made a step toward definiteness. There is a certain element of continuity in this line. Where did this continuity come from? It is everything upon it continuous. What I have really drawn there is an oval line. For this white chalk-mark is not a line, it is a plane figure in Euclid's sense, a surface, and the only line [that] is there is the line which forms the limit between the black surface and the white surface. Thus discontinuity can only be produced upon that blackboard by the reaction between two continuous surfaces into which it is separated, the white surface and the black surface. But the boundary between the black and white is neither black, nor white, nor neither, nor both. It is the pairedness of the two. It is for the white the active Secondness of the black; for the black the active Secondness of the white.

In this image of blackboard and chalk mark we have the perfect visual analogue of the simultaneous syntagm in human semiosis, which is a continuum ramified by discontinuities that are themselves continua. In this structure, the boundary is not only necessarily present but plays the crucial role of binding and separating simultaneously.

NOTES

¹ The characterization "purely mental" needs to be qualified somewhat. Kenneth Pike (p.c.) points out that "in phonological rhythm waves, the boundaries are often indicated by pitch, or by stress, or by voice quality. This does not change the fact that the recognition of boundaries must depend on interpretation." But he then draws the disputable conclusion that "if nothing is more than purely mental if it depends on interpretation, then all human behavior, of any kind whatever, does not exist, and has no physical component—since all of it, where it is relevant, depends upon human interpretation." What needs to be emphasized here for a proper understanding is that in human semiosis units of any kind are in varying degree dependent on interpretation, including stipulative convention, when the units are fully-coded. A phoneme or morpheme, for instance, typically has a material shape, consisting in speech of sound waves. Rules of selection and combination in a language determine what is to be counted as a phoneme or morpheme. But in the case of boundaries, the only physical clue we have as to a boundary's presence is via its effects on contiguous units. Hence the designation "purely mental" for boundaries, as for ranking.

² The example is drawn from Andersen 1975:23.

³ For a good survey of the relevance of the negative to a wide variety of fields and issues, see the articles in Weinrich 1975.

⁴ For this discussion of the relation between boundaries and cohesion I have relied in part on Andersen 1986.

⁵ As pointed out in Andersen 1986: 7, all of these phonological examples have exact parallels in the syntactic rules of discourse with analogous cohesive function. In both sectors of grammar, the combined effect of such rules is to create

texture. Corresponding to the phonological examples are the three main discourse strategies for participant tracking—called reflexivization, anaphora, and switch reference. Reflexivization applies within the domain of the sentence and is integrative. Anaphora and switch reference apply to mark continuities or discontinuities of participants between sentences and serve functions that may be called concatenative and delimitative.

⁶ This example is taken from Andersen 1975: 49.

⁷ The pioneer in adapting gestalt psychology and field theory to linguistics, particularly the theory of change in language, is the Indo-Europeanist and theoretician, Raimo Anttila. See esp. Anttila 1977, 1985, and 1992.

⁸ There is a growing literature exploring the role of markedness in semiosis. For a sampling, see Battistella 1990 and Andrews 1990. A historical and analytical overview is in Andersen 1989, on which (esp. 18–19, 24) is based the discussion in the following several paragraphs.

⁹ References to Peirce's *Collected Papers* are by volume and paragraph number separated by a dot.

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