

ZSIGMOND TELEGDI

Zur Geschichte des Begriffs ‚sprachliches Zeichen‘

Bekanntlich stammen die Termini *signifiant* und *signifié*, die Saussure in die moderne Sprachwissenschaft eingeführt hat, letzten Endes aus der stoischen Philosophie, stellen Übersetzungen der griechischen Ausdrücke *σημαῖνον* und *σημαινόμενον* dar. Saussure hat diese Ausdrücke übernehmen können, weil sie eine Interpretation in seinem Sinne, entsprechend seiner Auffassung des sprachlichen Zeichens zulassen, diese Auffassung zu verkörpern scheinen. Betrachten wir in der Tat die stoische Terminologie, so fällt in die Augen, daß diese Namen *relativ* sind, sich darauf beschränken, die Glieder einer Beziehung auf Grund ihrer Beziehung zu bezeichnen, abgesehen davon, wie sie an sich beschaffen sein mögen. So lag die Annahme nahe — sie ist auch mehr als einmal ausgesprochen worden —, daß Saussure sich an die stoische Konzeption des sprachlichen Zeichens anschloß, indem er dieses in *signifié* und *signifiant* zerlegte.

Die Quellen aber, aus denen wir die Kenntnis der altstoischen Sprachlehre schöpfen, wissen nichts davon, daß die Stoiker *σημαῖνον* und *σημαινόμενον* als die Komponenten des sprachlichen Zeichens betrachtet, daß sie die Rede überhaupt als eine Kommunikation durch Zeichen betrachtet hätten. Das führt nun auf die Frage, warum die Begründer des Stoizismus die Zeichentheorie der Sprache, die schon bei Platon und Aristoteles ausgesprochen ist, ignoriert, vielmehr — da sie ihnen kaum unbekannt geblieben sein konnte — abgelehnt haben.

Die Erklärung ist — wenn ich recht sehe — in der stoischen Auffassung des Zeichens zu finden. Die Stoiker verstehen unter *Zeichen* (*σημεῖον*) das (natürliche) *Anzeichen*, und sie bestimmen es, als ein *ἄξιωμα* — das heißt, nach ihrem Sprachgebrauch, als eine *Aussage* —, als das erste Glied einer hypothetischen Satzverbindung, deren beide Glieder wahre Aussagen sind. Als *ἄξιωμα* ist aber das Zeichen nach stoischer Lehre ein *λεκτόν*, und damit ein *σημαινόμενον*, nicht sinnlich wahrnehmbar, sondern intelligibel. Diese Ansicht ist jedoch mit der Zeichentheorie der Sprache unvereinbar; denn die Grundlage dieser Theorie ist die Betrachtung der Rede als ein Vorgang, bei dem der *sinnlich wahrnehmbare* Lautstrom als Zeichen einen *intelligiblen* Inhalt vermittelt.

Die Stoiker, indem sie es ablehnten, die sprachlichen Einheiten und die aus diesen gebildeten Verknüpfungen als *σημεῖα* aufzufassen, waren insofern konservativ, als sie damit die Ausdehnung dieses Wortes, bzw. des Zeichenbegriffs, über das Hergebrachte hinaus ablehnten.

Σημεῖον, ebenso wie das ältere *σήμα*, bedeuten ursprünglich einen wahrgenommenen Sachverhalt, der entweder als (natürliches oder konventionelles) *Anzeichen* das Bestehen eines anderen Sachverhalts anzeigt, oder als *Signal* eine bestimmte Tätigkeit veranlaßt; das Sagen (*λέγειν*) wird vom Zeichengeben (*σημαίνειν*) scharf unterschieden. Hier möchte ich nur zum Beispiel an einen bekannten Spruch des Herakleitos erinnern: „Der Herr, dem das Heiligtum in Delphoi gehört, sagt nicht und verschweigt nicht, er gibt ein Zeichen“; das Zeichengeben (*σημαίνειν*) liegt also zwischen dem Sagen (*λέγειν*) und dem Verschweigen (*κρύπτειν*).

Die Subsumption der sprachlichen Einheiten unter den Begriff des Zeichens ist demnach sekundär, sie ist erst als Ergebnis der wissenschaftlichen Reflexion, wahrscheinlich im Zusammenhang mit der großen geistigen Bewegung im V. Jahrhundert v. Chr., erfolgt.

Die Wechselwirkung zwischen diachroner und synchroner Phonologie
The Interplay between Diachronic and Synchronic Phonology
L'interaction de la phonologie diachronique et synchronique

ARTHUR S. ABRAMSON

**The Phonetic Plausibility of the Segmentation of Tones
 in Thai Phonology***

The specification of each morpheme in a tone language includes not only a sequence of consonantal and vocalic features but also a distinctive pitch pattern, which is manifested physically in the fundamental frequency of the voice. Linguists have generally analyzed Central Thai (Siamese) as having a five-way tonal contrast with the syllable as the domain of the tone. There are said to be three level or static tones, mid, low, and high, as well as two gliding or dynamic tones, rising and falling.

Some phonologists (e. g., Trager 1957; Leben 1973; Gandour 1974) have argued that the wholistic treatment of tones on the syllable in Thai is inherently wrong and should be replaced by a segmental treatment with various sequences of single vowels, double vowels, and final sonorants as the proper domain. While such arguments on the part of Trager (1957) may be a matter of personal taste in the manipulation of symbols for the writing of an efficient grammar, the generative treatments must be taken more seriously, since claims are made in this school of thought that the grammar should reflect the speaker's internalized knowledge of his language. By this reasoning, we must suppose that the speaker of Thai stores a lexical item with a dynamic tone as a properly ordered sequence of high and low tones or tonal features.

Linguists with the wholistic view of Thai tones have never felt obliged to defend their position. They knew the language well, and it seemed intuitively correct not to segment the tones. This feeling was supported by the native Thai grammatical tradition reflected in the orthography, which provides for the correct reading of the tones. Although there is scant literature on children's acquisition of Thai, my own observations and those of others suggest that children learn their basic vocabulary with a tonal contour as an integral part of each item. In fact, children may learn the dynamic tones before the static ones (Sarawit 1976).

The segmentalists argue that consonantal constraints upon the freedom of occurrence of the tones indicate a mapping of each tone onto a segmental base at the level of the underlying form. All five tones may occur contrastively only on syllables that end in a long vowel, or a short or long vowel followed by a sonorant. Except for a few loan words and onomatopoeic terms, a

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syllable with a short vowel followed by a final stop may take only the high or low tone, while a long vowel followed by a final stop may take only the low or falling tone. In addition, the lexicon includes practically no high or rising tones after certain initial consonants. It is also claimed that tone alternations in compound words are stated in a better formalism with a segmental approach. The general argument rests on the controversial premise that long vowels are sequences of two short vowels.

My thesis here is that a segmental analysis of the tones of Thai is unreasonable and unrealistic. I am not, however, arguing that such an analysis is not appropriate to any language. The most convincing case is one in which all contour tones are obviously derived from underlying sequences, as when vowels undergo *sandhi* across a morpheme boundary bringing about a merger of the final static tone of the first morpheme and the beginning static tone of the second morpheme to yield a contour.

Some African languages are said to have a rule of tone copying (Leben 1973). An inherently toneless syllable takes on the immediately preceding tone. Thus, a toneless element will become high after a high tone and low after a low tone. If, however, the preceding syllable bears a contour tone, the toneless element copies only the final "tone" of the alleged sequence in the contour. The tone-copying rule taken alone as an argument for segmentation succumbs to a natural explanation, which is simply that the pitch movement of the preceding syllable persists in its course through any following element that does not carry a distinctive tone of its own. Even if the latter arguments are accepted, the *sandhi* feature could lead to a segmental analysis of the tones of those languages anyway, although among these African languages there seem to be some which can be shown to have underlying contour tones (Elimelech 1974).

If, as it seems, the speaker of Thai learns every morpheme with its tone contour, why must a grammar include complicated rules to express the few consonantal limitations on freedom of occurrence of the tones? These facts are simple and may be seen as part of the speaker's knowledge without letting them force us into an improbable view of lexical entries. In fact, this knowledge has not kept Thai from breaking these "rules" in the tonal treatment of loan words. As for tone alternations and neutralizations in compound words, Gandour (1974) has shown instrumentally that the kinds of examples given by Leben (1973) are by and large untenable.

If we believe that the phonology of a language should lead very directly to correct phonetic outputs and auditory percepts, what phonetic evidence would help settle the argument? Would a phonologically disinterested phonetics point to a segmental organization of the tones? A good basis would be acoustic data showing that each of the static tones normally appeared as a level with, perhaps, slight contextually induced perturbations. If each dynamic tone normally appeared as a sequence of these levels with a rapid glide between them, the phonetic evidence would be even more consistent with a segmental analysis. Instrumental investigation of the physiological mechanisms underlying the tones might show segmentation in laryngeal maneuvers or aerodynamic forces. Perceptual evidence might be that static tones are more acceptable when produced as absolute levels rather than movements of fundamental frequency. Also, dynamic tones produced segmentally ought to be more acceptable than mere glides without end-point levels. One more phonetic question is the plausibility of the segmentation of long vowels into two short vowels onto which the tonal segments are mapped. There should be evidence of rearticulation halfway through a long vowel.

Fundamental-frequency contours of Thai tones (Abramson 1962, 1975; Erickson 1974) give no acoustic support to the segmental analysis. Although a criterion of relative movement seems to justify the dichotomy between static and dynamic tones (Abramson 1976), it is nevertheless true that all five tones show much movement. There are no true levels, and the dynamic tones are specified by their direction of movement and not by their end points.

Among the static tones, the fundamental frequency that comes closest to being a true level is that of the mid tone, but even so, it moves upward or downward at both ends or throughout its

extent through tonal coarticulation. The low tone starts near the beginning of the mid tone, drops quickly at first, and then falls slowly to the bottom of the voice range. Its early fall distinguishes the low tone from the mid tone. The high tone starts above the middle of the voice range and, often after a dip, slowly rises. The dynamic tones are exaggerations of the static tones. The falling tone starts just above the middle of the voice range, rises, and then falls abruptly to the middle or bottom of the range. It may thus be better named the high falling tone as contrasted with the low tone, which is a low falling tone. The rising tone starts near the beginning of the mid tone, drops quickly to the bottom of the voice range, then moves abruptly upward. The rising tone is thus really a low rising tone, while the high tone is a high rising tone.

The pattern of laryngeal-muscle activity underlying the contours of the tones of Thai might seem to support a segmental analysis. Such has been Erickson's interpretation of the data in her important dissertation (1976). Using electromyography, she found the activity patterns of a number of laryngeal muscles during the production of the five tones. Two muscles best represent her data. One of them, the cricothyroid, is the principal agent in the control of fundamental frequency. Its contraction stretches and stiffens the vocal folds causing the frequency to rise; when it relaxes, the frequency falls. The other is the thyrohyoid, one of the strap muscles, whose role in the control of fundamental frequency is moot. They contract in association with sharp falls of frequency, but no causal relationship has been demonstrated.

Erickson finds distinctive muscle patterns for the five tones. It is in the dynamic tones that she most readily finds support for segmentation. The rising tone shows a thyrohyoid peak for its initial drop followed by a cricothyroid peak for its sharp rise, while the falling tone shows a cricothyroid peak first, for its initial rise, followed by a thyrohyoid peak for its sharp fall. The static tones, even when occurring on long vowels, are not obviously to be divided temporally into segments of contraction and relaxation nor, for that matter, do they show uniform patterns throughout as might be expected in true geminate tones. If one reads support of a segmental view into the complicated muscle data, he is then obliged to reconsider the phonetic integrity of a number of conventionally accepted vocalic and consonantal segments with their temporally resolvable peaks of muscle activity, as in aspirated stops and semi-vowels.

As for perception, some observers hear the static tones as levels, and it is possible that in some instances of these tones auditory averaging of small movements will indeed give the impression of levels; however, it is easy to hear pitch changes most of the time. Indeed, many foreigners have trouble distinguishing between the mid and low tones on the one hand and the mid and falling tones on the other. That is, although experiments in speech perception (Abramson 1976) do support a dichotomy between tones with large pitch shifts and those without, the term *static* for the latter is an exaggeration. Although other experiments show that fundamental-frequency levels can be heard as the three static tones by Thai subjects, their acceptability is enhanced when they are synthesized as glides (Abramson 1975). One can synthesize very acceptable dynamic tones by using continuously changing contours (Abramson 1962, 1975, 1976), but preliminary work suggests that rapid movements between low and high levels will not yield equally acceptable dynamic tones.

Acoustic data do not enable us to show that the long vowels of Thai are segmentable into sequences of two occurrences of the same vowel (Abramson 1962, 1974), nor do I know of any electromyographic evidence of rearticulation in long vowels.

I conclude that the traditionally espoused unitary status of the tones of Thai is unshaken. The arguments for segmentation based on interactions between tones and consonants are too devious and weak to be convincing. When we turn to phonetic data, the argument becomes even less plausible.

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HANS BASBØLL

On the Use of “Domains” in Phonology

1. Introduction: A unified theory of the function of boundaries

The junctural framework of my presentation is unified in the sense that it ascribes the same function to syllabic and grammatical boundaries. It is also unified in the sense that the boundaries function as different values on the same scale, as it were, and not as qualitatively disparate entities (cf. Chomsky/Halle). Finally, it is unified in the sense that boundaries do nothing but delimit “domains”. The framework is as follows¹:

- 1) The phonology of each language makes use of a small number of different boundaries (in general the syllabic boundary and several grammatical ones) which are *linearly ordered* (cf. McCawley).
- 2) The *function* of boundaries in phonology is to *define* “domains”, i. e. each boundary defines the extension of a phonological string which is delineated on both sides by the boundary in question or a stronger one, whereas all its internal boundaries are weaker than the defining boundary (called the “rank” of the domain).
- 3) Domains have two functions with respect to phonological rules: *every rule has a domain* as its “universe of application” (which means that the application of the rule is blocked by any boundary which is at least as strong as the rank of the domain of the rule in question), and, furthermore, *domains may occur in the SD as “units”* (e. g. syllables).

¹ Hans Basbøll: “On the function of boundaries in phonology”, in: D. L. Goyvaerts, ed., *Phonology in the 1970's*, Ghent: Story-Scientia, 1978, with detailed references.

4) *No boundary is allowed to occur in the SD* (if we accept the use of variables as proposed by Stanley, i. e. boundaries can have a delineating function with respect to a rule).

From a traditional linguistic standpoint, there is certainly nothing revolutionary in these claims, since they embody the postulate that units like the syllable and (some type of) word, and so on, can serve as the domain for phonological processes, and that they themselves can be referred to by such processes. Boundaries are thus merely devices to delineate the domains in question, and have no independent function in phonology.

In fig. 1, I have listed the morpheme boundary on the left, and then five other boundaries in order of increasing strength. Each of these five boundaries plays a role in Danish phonological rules. I have shown elsewhere (in ALH 16) that the same boundaries are relevant in French phonology, except that the "compound boundary", no. 4 in fig. 1, has no French parallel.

When I say that the boundaries are linearly ordered, this does not of course mean that a 'minor P-word', to take just one example, necessarily consists of one or more syllables. What the hypothesis of linear ordering of the boundaries in this case implies is that all rules which are blocked by the syllable boundary will also be blocked by the double cross boundary, but not the other way round. It follows from the framework used here that domains occurring in the SD of a rule must always be of a lower rank than the rule itself.

As indicated in fig. 1, the phonological role of the morpheme boundary is not exactly the same as that of the other boundaries. The morpheme boundary is the rank of morpheme structure conditions and not of phonological rules proper, and it does not seem to be unambiguously ordered with respect to the syllable boundary since neither of these two boundaries can block rules or conditions ranked by the other. If I have included the morpheme boundary in the present context as the weakest one it is because the fact that the syllable boundary does not block morpheme structure conditions can be explained by the origin of the syllable boundaries from within phonology itself, i. e. they are not available when the morpheme structure conditions apply.

2. *On domains occurring in the SD: A note on Danish stress rules*

It is well known that syllables may occur as a domain in the SD of phonological rules, e. g. stress and tone rules (cf. McCawley). A Danish example of this is rule 3. This rule states that a stressed ultimate or antepenultimate syllable gets *stød* ('kapítal' and 'Akrópolis', respectively), as opposed to a stressed penultimate (e. g. 'muséum'). Notice the use of the variable X (following Stanley) indicating that segments may occur to the left — as opposed to the right — of the explicit SD; the ($D^{\#}$ $D^{\#}$) must thus be final in the relevant 'minor P-word' (the rank of the rule).

Another domain occurs in the SD of rule 5: this is a simplified version of the compound stress rule, which has rank no. 5. The other important stress rule in Danish is rule 4, the "final stress rule"; in agreement with the fact that its rank is lower, viz. no. 4, it applies before rule 5 (see below). Rule 4 will reduce all non-final stresses in any domain of rank no. 4. This rule applies within words (e. g. 'veninde') as well as across word boundaries (e. g. 'på en vén'). It will account for the fact that "small words" in the beginning of phrases are indistinguishable (phonologically speaking) from prefixes. When this rule has applied, rule 5 will ascribe — on the basis of the tree structure — the typical Germanic compound stress to a sequence of domains of rank no. 4.

Notice that according to this stress model, the first part of a compound *includes* preceding "small words" within the same P-phrase. I think this is phonologically true, and thus one more example of overlapping between phonological and grammatical structuring (in this case "proclisis"). Thus the P-phrase 'når en violinspiller' consists of the two domains of rank no. 4: 'når-en-violin' and 'spiller' (cf. fig. 1). The present analysis seems to resolve a problem of earlier analyses of Danish stress: which connection is there between the final stress applying within words and the final stress applying within phrases (apparently with the compound stress rule "in between")? My answer is that there is only one final stress rule, viz. rule 4 here.