SUPERFIXES AND INTONATION PATTERNS

The *Outline of English Structure* which George L. Trager and Henry Lee Smith, Jr., published in 1951 is generally known and widely accepted, at least in the United States, as the best available statement of the English phonemic system and as a stimulating first approach to certain problems of English morphology and syntax. A revised edition is in preparation. Meanwhile, in his notable *Manual of Phonology,* Charles F. Hockett has attempted a structural re-statement of the facts of English stress and pitch as Trager and Smith presented them. In this paper, I shall consider the adequacy of that re-statement. Adverse judgment on so small a part of a rich book should not conceal my respect for Hockett's work.

Trager and Smith recognize four relative but significantly different levels of pitch in English, three terminal junctures, one internal juncture, and four stresses. Of the pitches, /4/ is the highest, /1/ the lowest, /3/ a normal high, and /2/ a kind of base-line or median, often a "beginning pitch" in American English. The terminal junctures, known from the symbols with which they are written as "single bar" (/|/), "double bar" (/||/), and "double cross" (/#/), are also defined in the *Outline* primarily in terms of pitch. Single bar is "terminal sustention at the level previously marked," double bar is "terminal rise from the previously marked level," and double cross is "terminal fall" which "quickly moves down to silence." The four stresses are primary (/ˊ/), secondary (/ˆ/), tertiary (/ˋ/), and weak (/˘/). Internal open juncture (or plus juncture, from the symbol for it: (/+/) is not so much defined in the *Outiine* as illustrated by pairs like *night-rate* vs. *nitrate.* Generally speaking, segmental phonemes before plus "appear as they do" when they are "final in an utterance."

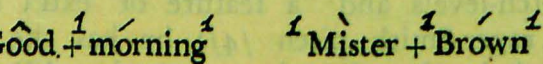
Most of these twelve phonemes of pitch, juncture, and stress remain in Hockett's analysis, though his terminology is different. Hockett has three pitch-levels and "a feature of 'extra height' " which replaces the Trager-Smith pitch /4/; he has the three terminal junctures, though he describes them somewhat differently and calls

them terminal contours; he has internal open juncture (the Trager-Smith plus); and though he has just three stresses, or perhaps only two, still point-by-point translation into the Trager-Smith four-stress system is possible. The similarities between the two analyses greatly outweigh the differences.

I shall ignore some of these differences, including Hockett's attempt to show the "hierarchic organization" of "the ultimate phonologic constituents" of English intonations; and I must begin by noting that many of the differences stem from Hockett's use of an observation which Trager and Smith and a number of other students have also made. Between any two successive terminal junctures, according to Trager and Smith, there must be one and only one primary stress; or, as Hockett phrases it, in any macrosegment there is one syllable which "is at least slightly more prominent than anything before or after it" and which therefore may be considered "the *center* of the intonation." Without this doctrine of the center, comparison of the Trager-Smith analysis with the Hockett analysis would be impossible.

Hockett recognizes only three pitch-levels. The presumed pitch /4/ does not occur, he says, in any intonation with a /3/, which /4/ systematically replaces when /4/ occurs at all. Moreover, /4/ does not occur in an intonation with /2/ or /1/ at the center. It follows for Hockett that in any intonation where a /4/ occurs, there is a /4/ at the center, and the other pitches are /4/ or /2/ or /1/. Since the distribution of the presumed /4/ is so limited, to recognize it as another pitch-level would create within the analysis the possibility of far more sequences of pitch-levels than actually occur, and Hockett uses the height-feature to escape this consequence. In any given intonation, extra height "either occurs, or does not occur..... All intonations with /3/ at the center may occur either with or without this extra feature; intonations with /2/ or /1/ at the center do not show it"; and its phonetic effect is limited to the occurences of /3/, which it makes higher than usual. Hockett symbolizes extra height by writing an upward-pointing arrowhead "directly before the [pitch-level] sign at the center of the intonation."

To test Hockett's reasoning, I propose two utterances. In the first, as I hear it, pitch /4/ does occur in an intonation with /1/ at the center:

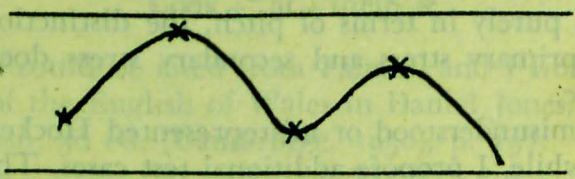


On *good* in this kittenish greeting, I hear pitch /4/, but the primary stress is on the low-pitched first syllable of *morning*. Such greetings are commonly used, and if I have heard them properly, Hockett's facts are wrong.

I take my second example from Dwight L. Bolinger, "The Melody of Language," *Modern Language Forum,* XL (1955), 22 f. Bolinger gives the sentence,

I said he would,

with an intonation that may be represented thus:



I have tried this sentence on my wife, a native speaker of British English, who says it sounds natural and who identifies *said* as the loudest and highest syllable, *would* as the next loudest and highest. Since I hear no terminal juncture within the utterance, I must conclude that it shows a rare five-place intonation with /4/ on *said* and /3/ on *would*. If so, it does not square with another of Hockett's statements, that "in a macrosegment there are two, three, or four positions for distinctive occurrence of a PL, never fewer and never more." I add that if we really want to play with raisers, lowerers, and the like, I believe I can write any Trager-Smith intonation-pattern with just four symbols: a raiser (which may occur simultaneously with itself), a lowerer, and two terminals.

Hockett likewise reduces the number of stresses from four to three or perhaps even two. He does so, I take it, by assuming that the Trager-Smith primary stress and secondary stress do not differ phonemically, since the occurrence of primary stress is predictable from the intonation: primary occurs at the center, secondary occurs elsewhere. If this is true, then every stressbearer must have one of three degress of stress; and if two of these three degrees are consistently marked, the third can be "zeroed out," since it will always occur where neither of the other two occurs. Hockett suggests that loudest stress, not weak stress as in Trager-Smith, be left unwritten. I am not quite certain whether he regards the loud stress thus zeroed out as "phonemic" or not, but he seems to treat it as non-phonemic (pp. 52, 66, 70, 152, 220, etc.).

Obviously, Hockett's reduction in the number of English stresses depends on his theory of the center of an intonation. Developing that theory, he maintains that only one pitch-level can occur after the center. The final pitch-level "may be actually reached at the end of the macrosegment, or it may be reached slightly before the end, the remaining changing contour of pitch depending on the [terminal contour] which is written at the end of the macrosegment." In either case, "the last [pitch-level]..... is never higher than the one at the center." The intonation from the center onward can therefore be precisely represented by writing two pitch-levels immediately before the center and a terminal juncture at the end; and with the center thus identified purely in terms of pitch, the distinction between the Trager-Smith primary stress and secondary stress does indeed cease to be phonemic.

If I have misunderstood or misrepresented Hockett, I await correction. Meanwhile, I propose additional test cases. The fact that the center of an intonation must be identified by writing two pitch-levels before it suggests one test, a search for utterances in which the rate and place of all from a high pitch at the center varies significantly In such hypothetical utterances, Hockett's writing would obscure a contrast by making the earlier and the later fall identical. From Armstrong and Coustenoble, *Studies in French Intonation* (Cambridge, 1934), p. 201, I take the following relevant sentences:

1. 2 It's + 4 utterly + ridiculous 1 #

This sentence, with its gradual fall from highest pitch on *utterly*, merely emphasizes the ridiculousness of the situation; it suggests no contradiction of a statement that the situation is only mildly ridiculous. If the gradual fall is replaced, however, by a quicker one, the meaning changes:

2. 2 It's + 4 utterly + ridiculous 1 #

The earlier fall gives to the sentence the contrastive meaning that the situation is not just mildly ridiculous, but utterly ridiculous. Unless the change in meaning can be attributed to a difference in stress or to a difference in the position of the center, Hockett's theory is erroneous.

Other evidence against the theory would be utterances in which two pitch-levels occur after the center, the first of them being higher

than the center and the second being lower than the first. In most such cases, no possible writing of two pitch-levels before the center and a terminal contour at the end of the macrosegment would serve. Harold Palmer, *English Intonation* (Cambridge, 1922), provides numerous specimens:

$$^{2}\text{Won}\,^{\prime\,3}\text{derful}\,^{1}\#$$

$$^{2}\text{Both}\,^{\prime}+\,^{3}\text{of}+\text{us}\,^{1}\#$$

$$^{2}\text{Look}\,^{\prime}+\,^{3}\text{at}+\text{them}\,^{1}\#$$

Other examples could be cited from Palmer, and I find still another in a specimen of the English of Wales in Daniel Jones, *The Pronunciation of English,* 3d ed. (Cambridge, 1950), p. 157:

$$^{3}\text{re}\,^{\backslash\,2}\text{mark}\,^{\prime\,3}\text{able}\,^{1}\#$$

J. D. O'Connor, "The Intonation of Tag Questions in English," *English Studies,* XXXVI (1955), p. 98, includes the sentence:

$$^{2}\text{It's}+\text{a}+\,^{2}\,\text{love}\,^{\prime\,3}\text{ly}+\text{one}\,^{\backslash\,1}\#$$

Similar patterns are not uncommon in my own speech. On October 24, 1955, I said to my young son, who was playing with his food:

$$^{1}\text{Eat}\,^{\prime}+\,^{3}\text{your}+\text{lunch}\,^{\wedge\,2}\#$$

Occasionally, I use the bored greeting:

$$^{1}\text{How}\,^{\prime}+\,^{3}\text{are}+\text{you}\,^{\backslash\,2}\#$$

Sometimes, finally, I use three pitch-levels on what seems to me a single syllable, as when I said "Oh!" to a friend at a cocktail party on October 22, 1955, using the intonation-pattern /231 #/. This particular exclamation is described in Sweet's *New English Grammar,* II, p. 228.

Hockett himself suggests a third test of his theory of the center. "The last [pitch-level] of the macrosegment," he says in his text, "is

never higher than the one at the center. This does not mean that the pitch of the voice cannot rise between the center and the end, but when it does, the rise is interpreted as [the terminal contour equivalent to the Trager-Smith double bar], not as a higher [pitch-level] at the end." Differences in the extent of this final rise do not contrast, Hockett says; but he adds a footnote recording Kenneth Pike's disagreement and his own uncertainty in the matter.

Following this clue, I find in the literature and in my own speech abundant evidence that higher and lower final rises *are* distinctive. Thus Sweet wrote in 1891 that the word "*what* with a slight rise expresses mere enquiry, but with a long rise—rising from a very low to a very high pitch — it expresses surprise or indignation" (*NEG*, I, 229); and in 1955 O'Connor contrasted the high and low rises at the end of the sentence, "It's quite certain, isn't it?" "With the low rise," O'Connor says, "the assertion conveyed by the falling statement is a good deal softened," but the speaker still expects a "confirmatory answer." The high rise, on the other hand, marks a reversal of the speaker's attitude from certainty to doubt. Equally convincing examples can be found in Palmer's and Blandford's *Grammar of Spoken English*, in Wiktor Jassem's *Intonation of Conversational English*, and in the speech of all native Americans whose use of rising intonations I have studied.

For the reasons which I have given, then, I cannot accept Hockett's re-statement of the facts of English stress and pitch. His feature of extra height cannot replace the Trager-Smith pitch /4/, whose distribution he has not stated accurately; his reduction of the number of stresses from four to three depends on his theory of the center of an intonation; and his theory of the center fails because early and late falls from a high center are sometimes distinctive, because more than one pitch-level may occur after the center, and because final low and high rises are in contrast. To my mind, the original statement by Trager and Smith remains the best available.

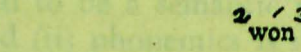
It is still far from perfect. What is needed to improve it is purposeful collection of more data and comparison with other analyses. Specifically, I offer the following unoriginal suggestions. (1) The phonetics of stress, pitch, and juncture needs extensive study. (2) There is a residue of phenomena, most of them noted by Pike, which cannot be easily accommodated within the Trager-Smith system and which should be fully investigated. (3) More information is needed concerning dialectal differences in intonation, particularly if systems are to be proposed which allegedly account for all varieties of En-

glish. (4) Detailed comparisons should be made among the competing systems in order to establish the elements common to them all, to discover and state the unresolved conflicts among them, and to establish rules of translation among acceptable alternatives. (5) An effort must be made to eliminate unnecessary differences in symbols and terminology. (6) The role of stress-patterns and intonation-patterns in morphology and syntax should be systematically explored as Trager and Smith have already begun to do and as the title of this paper falsely suggested that I might do myself.

James Sledd

Note: This paper was read at the meeting of the Modern Language Association of America in December, 1955, and its composition and reading led to certain correspondence which must be mentioned here. Before it was delivered, Professor Hockett was kind enough to examine it and to say that it involved "no essential misunderstandings or [mis]interpretations" of his **Manual**. He asked me, however, to make clear that since writing the **Manual** he had refined his views of English intonation and had prepared a new and more complex statement for a forthcoming textbook; and he raised the very important theoretical question where language ends and those things begin which Trager and Smith have called voice-qualifiers. Were the crucial features which I had taken in my examples as intonational, really intonational, or did they belong to some other communication-system than language in the narrow sense?

After the paper was delivered, it was attacked from another direction by a friendly critic who questioned the accuracy of the transcriptions. If they are right, he pointed out, then intonation patterns "are not statable as morphemes whose phonemic elements combine with the segmental data at mechanically predictable points"; and if intonation patterns are not so statable, that fact is a graver objection to the Trager-Smith system than Hockett's revisions of the system have embodied. For example, a /231#/ intonation pattern on the word **wonderful** might give



as in my paper; but what then could be done with the sort of utterance that Palmer calls "intensified," in which there is a clearly audible rise from mid to high pitch on the first syllable of a word like **wonderful**, followed by a fall to low pitch at the end? Intensification would here also involve the intonation pattern /231#/, but differently — and hence not automatically — combined with the segmental morphemes. Like Hockett, my critic suggested that in such examples voice qualifiers might be involved.

My remarks, then, if they have any value, are valuable not because they answer questions but because they raise them. My conviction has been strengthened that we are much farther from a satisfactory analysis of English stress and pitch than we might like to believe. — J. S.