

## GLOBAL RULES AND PHONOLOGICAL PROCESSES

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The treatment of intonation within the framework of generative grammar has been anything but satisfactory<sup>1</sup>. Apart from an early paper by R. S. Stockwell (1960) not much has been written that could suggest ways of handling intonational phenomena. It seems, however, that intonation poses serious problems both for a descriptively adequate grammar and for a linguistic theory that underlies it. Here is a case to illustrate the latter point. It was tacitly assumed that intonation contours could be assigned by rules that apply to the surface syntactic structure in more or less the same way as other rules of phonology. What must be stressed is precisely the surface structure aspect of intonation assignment; although it has been established beyond any doubt that surface syntactic structure is indispensable for the proper formulation of phonological rules, it is not at all obvious whether, by itself, it provides enough information, i.e., whether reference to some deeper syntactic and semantic facts<sup>2</sup> may not be germane. The first to suggest that this may indeed be the case was K. Zimmer (1969). Following a remark of Postal's<sup>3</sup> he presented evidence from Turkish which clearly indicated that the surface structure alone is insufficient in the case of intonation and that it was only when the deep structure of sentences was taken into account that the desired results could be obtained.

<sup>1</sup> I would like to express my indebtedness to B. Marek for many hours of discussion that helped clarify a number of points. He also read the paper in manuscript and his criticism saved it from many failures. For whatever defects remain I alone am responsible.

<sup>2</sup> Chomsky and Halle (1968 : 88) note in passing that the applicability of the rule deleting the affix -*æ*l "depends on the sense of the word, that is, its semantic features". Unfortunately, this point is not elaborated any further. It is, however, of overriding importance for the theory of phonology to decide whether phonological rules can be made sensitive to semantic features and to show the way it can be accomplished.

<sup>3</sup> Postal (1968 : X, fn. 5): "No one has ever suggested that Deep Structure is relevant for phonology (although this is of course logically possible)".

Zimmer's article seems to be a break-through in generative phonological studies — not because of his analysis of some facts of Turkish structure, but because of the far-reaching implication of the analysis, viz. the demonstration of the necessity to modify some of the present day assumptions in phonology. The weight of these implications has increased in view of the recent developments in syntactic studies which have resulted in the abandonment of the notion of the deep structure and interpretive semantics as they were originally conceived. If the deep structure of the early transformational studies possesses no systematic status, as Lakoff, Ross, McCawley and others maintain, and if we are forced to posit underlying structures that look less and less like the familiar deep structures, then the problem of Turkish intonation and others, that might crucially depend on the maintainance of that level of representation, require a thorough re-examination. Furthermore, in view of our limited knowledge at present of the conceptual structures we are left with a number of fundamental issues where at least some clarification is urgently needed. A few obvious questions await answers: what exactly does it mean now to say that the deep structure is in some way relevant to phonology? Is it the putative universal semantic or conceptual structure that is to determine some aspects of phonetic manifestation? In what way? Or is it perhaps some stage in the derivation of the sentence between the semantic base and the surface that has some bearing on the rules of phonology? Or is it both? Although our present understanding of the nature of semantic representations cannot be viewed as offering a firm ground on which to base the discussion of phonological phenomena, it still seems possible to take semantic facts into account while analysing, say, intonation or stress in precisely the same way as, a reversed situation obtaining, intonation and stress are legitimately used in support of syntactic and semantic claims<sup>4</sup>. The purpose of the present paper is to demonstrate that within English phonology a number of facts require reference to something deeper than the surface structure and to offer a few speculative remarks as to how certain problems could be handled.

Let us start by observing that rules assigning intonation contours take into account the syntactic structure of sentences. Consider the following examples:

1. *Have you, finished?*
2. *You've, finished?*

where the sentence in 2 is an ordinary (NOT echo) question. No matter whether we decide upon the Aspects 65 view of syntax or upon that of generative semantics, it is clear that the deep structures must contain some indication that these sentences are questions — be it a constituent QUESTION or a sentence something like "I ask you...". The only element which signals that

<sup>4</sup> Cf., McCawley (1970 : 288), McCawley (1971b : 106), Postal (1971 : 183).

the sentence in 2 is a question is intonation. Consequently, a rule is needed that, upon application, will render it a question. In what follows we shall be concerned not with the precise formulation of the rule, but rather with the more general question whether the rule applies to the surface structure or whether it takes deep structure relations into account.

The former possibility is immediately eliminated once it is noted that the present formulation of the surface structure does not allow for the constituent QUESTION to appear in it (cf. Jacobs and Rosenbaum 1968: 123). Any modification of the concept of the surface structure for the sole purpose of accommodating constituents that play a crucial role in intonation assignment is of dubious value at best. Without further considering the implications of such a position we shall proceed to examine facts that strongly support the view hinted at, viz. the necessity of taking deeper relations into account while formulating rules assigning intonation contours and, at times, stress patterns.

Consider first the intonational difference between restrictive and non-restrictive relative clauses. This can be illustrated by two celebrated examples:

3. *The<sup>1</sup> Greeks who were philosophical<sup>1</sup> liked to, talk.*
4. *The<sub>1</sub> Greeks, who were philosophical<sup>1</sup>, liked to, talk.*

No evidence seems to indicate that the surface structure (labelled bracketing) of the two sentences is different. But the difference in meaning correlates precisely with different intonational phenomena — in fact without the latter difference it would make no sense to talk about the former. We are thus immediately brought to the following conclusion: if the deep structure (semantic) differences between 3 and 4 are to be preserved, the rules assigning intonational patterns must be sensitive to something different from the surface structure. An identical argument holds for attributive adjectives resulting from relative clause reduction and adjectival shift transformations. These, upon application, will change the structures underlying 3 and 4 into 5 and 6 respectively. Again the only surface difference between them is that of stress and intonation contours (cf. Langendoen 1969: 94, fn. 11).

5. *The philosophical Greeks, liked to, talk.*
6. *The philosophical<sup>1</sup> Greeks<sup>1</sup> liked to, talk.*

The constituent structures of 5 and 6 seem identical and reference to either their underlying representations or some earlier stage in the derivation appears indispensable if stress and intonational contours are to be assigned correctly.

The question may arise at this point whether the deep structure of the Aspects 65 model satisfactorily accomplishes this aim or whether a still more abstract structure must be taken into account. To try to answer this question let us consider the phonological implications of Bach's (1968) analysis of nouns and noun phrases. He produces a number of arguments for deriving surface

nouns from deep structure relative clauses. It will be recalled that the sentence in 7 is, according to his analysis, derived from something like the structure in 7'.

7. *The professors 'didn't sign a petition.*

7'. *NEG the ones who were professors signed something which was a petition.*

In this formulation, the sentence in 7 contains in its deep structure two embedded sentences, each of which can be negated and consequently we obtain 8 and 9:

8. *The professors didn't sign a petition.*

8'. *The ones NEG who were professors signed something which was a petition.*

9. *The professors 'didn't sign a petition.*

9'. *The ones who were professors signed something NEG which was a petition.*

Thus the assumption that nouns are in fact deep structure relative clauses obliterates the traditional division between sentence and element negation by showing that the latter is a particular instance of the former. Bach (1968 : 98) goes on to say that "the intonational facts seem to support this idea. Notice that in each case, we can predict the point of prominent pitch and stress by looking at the original position of the negative elements" (emphasis added — E. G.). Here Bach states that surface structure alone does not provide enough information for the proper assignment of stress and pitch, while this can be easily accomplished when the deep structure is taken into account. He does not go on to consider implications of this conclusion, nor does he provide any clue as to how stress and pitch assignment could be analysed within the theory of the relative clause origin of noun phrases.

There are a number of points connected with the problems discussed by Bach that deserve further elaboration. Notice in the first place that stress and pitch assignment in 7 are drastically different from that of 8 and 9. 7 has the intonation pattern of an ordinary declarative sentence pronounced in a neutral way with the nucleus on "petition", while 8 and 9 are assigned stress and intonation patterns of what would be normally referred to as emphatic sentences. Thus in 8 we get the nucleus on "professors" accompanied by a greater degree of stress, while in 9 "petition" receives the kinetic tone just as in 7, but the degree of stress is the same as with "professors" in 8. This difference in intonation facts correlates quite directly with a difference in meaning as also noted by Bach. Thus 8 says that somebody else did sign the petition while 9 asserts that what the professors signed was not a petition. No such additional meaning is involved in 7, where we are simply informed about the fact that the professors did not sign a petition and we do not know whether anybody or anything else was at all involved. Consequently, the status of the three sentences is different: 8 and 9 contain more information and one would expect their deep (semantic) structures to be different from that of 7. This observation is cor-

roborated by the fact that there exist more possibilities of negating the sentence "The professors signed a petition"<sup>5</sup>.

10. *The professors 'didn't sign a petition.*

11. *The professors 'didn't sign a petition.*

where 10 could be continued as e.g. "I've told it to you a dozen times before" while the status of 11 seems identical to that of 8 and 9 with the additional meaning being "they did something else to it". Notice furthermore that the sentences 7 through 11 have their affirmative equivalents 12 through 16 both as far as meaning and prosodic phenomena go:

12. *The professors signed a petition.*

13. *The professors signed a petition.*

14. *The professors signed a petition.*

15. *The professors signed a petition.*

15a. *The professors did sign a petition.*

16. *The professors signed a petition.*

Bach's analysis of noun phrases proves unsatisfactory in these cases as the sentences 12 - 16 would, according to his analysis, possess the same underlying structure (at least as far as noun phrases are concerned). It also fails to account for the difference between 7 and 11. The examples considered by Bach seem to be special cases of a broader phenomenon that may, in certain instances, interact with negation though it does not have to.

It may be noted that the sentences 8 - 11 and 13 - 16 but not 7 and 12 would be normally considered "emphatic" but the notion of emphasis has usually been given a very vague definition. Typical of these is the following assertion by Lawendowski (1970 : 73): "It (emphasis — E. G.) is not separable from language and has no referential meaning in and of itself but is used in interpersonal communication to signal the importance of a given element of language". That emphasis is not separable from language has never been called into question, but all the other statements are hardly informative. "Emphasis" is a term imposed upon certain phenomena in language in precisely the same way as are pronominalisation in syntax and velarisation in phonology. One could expect that a definition of emphasis would reveal the nature of the phenomenon it is intended to cover in the same way as velarisation is said to be a process consisting in the superimposition of the features  $\begin{bmatrix} +high \\ +back \end{bmatrix}$  onto a given segment. An attempt to give a tentative formulation of what is usually understood as emphasis is presented below.

<sup>5</sup> This was noted by Ch. Fillmore; cf. Bach (1968 : 98, fn. 4).

Taking the meanings of 7 and 12 to be the basic ones we can crudely paraphrase the remaining sentences as follows:

- 8=the meaning of 7+“somebody else signed it”  
 9=the meaning of 7+“the professors signed something else”  
 10=the meaning of 7+“you should know it already” (you were told before)+  
 (possibly) “I’m impatient with you”  
 11=the meaning of 7+“they did something else to it”  
 13=the meaning of 12+“not somebody else”  
 14=the meaning of 12+“not something else”  
 15 and 15a=the meaning of 12+as in 10.  
 16=the meaning of 12+“they did not do anything else to it”.

This is anything but a complete semantic analysis of the sentences. Another component of the meaning of 7 - 16 is connected with the fact that they are all declaratives. J. R. Ross adduced a number of compelling arguments in support of his claim that the majority of declarative sentences are to be “analysed as being implicit performatives, and must be derived from deep structures containing an explicitly represented main verb” (Ross 1970 : 223). Ross noted, however, that the rule of Performative Deletion necessary for the derivation of the surface form of declarative sentences cannot be limited only to verbs of saying but should be so extended as to cover verbs of commanding in generating imperatives as well as “other types of verbs, so that exclamatory sentences, and optative sentences, and other sentence types, will arise from the same rule” (Ross 1970 : 249). Thus our sentences:

17. *Have you, finished?*  
 18. *You’ve, finished?*

would be derived from the same underlying structure containing at the top-most S a first person subject, a second person indirect object and a verb of asking. Consequently 19 would differ from 18 in that the former contains a verb of saying while the latter a verb of asking in the underlying representation. The different intonation contour could be treated as a result of the rule assigning intonation patterns that is sensitive to the appropriate element of the underlying structure.

19. *You’ve, finished.*

The rules assigning intonation could be another instance of Lakoff’s global rules (Lakoff 1970). This way of handling intonational phenomena allows for a more uniform statement of the two disparate sets of facts, namely phonological phenomena (intonation assignment) and syntactic processes (interrogative transformation) that are now seen to depend crucially on the same deep structure configurations. In this way questions formed by interrogative

transformations and by intonation contours only are related to the same underlying structures<sup>6</sup>.

We can now return to our original questions and try to see how intonation patterns are assigned in the case of structures more complex semantically. The sentence in 8 was analysed to consist of 7 plus another element corresponding to “somebody else signed it”. The performative verb constitutes the necessary environment for the assignment of the statement intonation contour. Consequently it must be available at the time the rule assigning intonation becomes operative and this is explicitly allowed by global rules. Extending the same principle we can pair the deletion of “somebody signed it” with the assignment of a stronger stress and an intonation pattern that diverges distinctly from that of a pure statement. Other cases (8 - 10) would be assigned intonation in the same way: the deletion of the additional sentence is possible only when there is a rule capable of converting the information contained there into some prosodic phenomena, for otherwise it would be lost irretrievably. The deletion is impossible when the semantic structure contains elements corresponding to e.g. the surface “I am quite sure that...” or “John has just told me...” etc. An attempt will be made below to delimit the scope of possibilities of reducing certain elements of the semantic structure at the expense of prosodic elements.

The same case of emphatic stress and intonation is extremely common and can be discussed independently of other questions that have not yet been satisfactorily solved. Let us take the case of genitival construction in English (cf. Nagucka 1971), i.e. *Eric’s dictionary* vs. *Webster’s dictionary*. No matter what the appropriate deep structures of these constructions are and no matter what transformations one has to apply to those, it is immediately apparent that either of them can contain an additional element in the deep structure that gets reduced to stress and intonation.

20. <sup>1</sup>*Eric’s dictionary is, good.*  
 21. <sup>1</sup>*Webster’s dictionary is, good.*  
 22. <sup>2</sup>*Eric’s (not, say, Brian’s), dictionary is, good.*  
 23. <sup>2</sup>*Webster’s (not some other one), dictionary is, good.*

The same goes for almost any other structure, eg.:

24. *They talked loud in the cinema.*

<sup>6</sup> This seems to be the intent of the frequent statements (cf. fn. 4) relating the grammaticality of a sentence with an appropriate stress and intonation pattern. Obviously, the well-formedness of a sentence, i.e., its having undergone certain transformations or having met certain derivational constraints, cannot depend on rules assigning stress and intonation. Consequently the grammaticality of the sentence (Postal 1971 : 183): *I reminded myself of a gorilla* as opposed to the ungrammaticality of the sentence without contrastive stress seems to suggest that certain syntactic transformations and certain phonological rules can be reduced to the same underlying cause(s).

where any morpheme can receive prominence and a different intonation contour.

There seems to be a general principle underlying examples of this sort as they all appear to entail a negative element. Thus:

25. *They talked loud in the cinema* = they and not (not they)
26. *They talked loud in the cinema* = talked and not (not talked)
27. *They talked loud in the cinema* = loud and not (not loud)
28. *They talked loud in the cinema* = in and not (not in)
29. *They talked loud in the cinema* = the and not (not the)
30. *They talked loud in the cinema* = cinema and not (not cinema)<sup>7</sup>

This way of representing the underlying structure has the advantage of accounting for the fact that e.g. 26 cannot possibly mean "They did not snore in the cinema" or cannot refer to any particular of the endless number of possibilities. In other words, the semantic structure of emphatic sentences does not specify the details but merely marks everything off. This is accomplished by the deep structure that represents the elements to be eventually strongly stressed, as a double negative. 22 says that Eric's dictionary is good without providing a clue as to whose dictionary in particular is not good. Likewise, the sentences 7 and ff. can be accounted for:

31. *The professors signed a petition* = something which was a petition.
32. *The professors signed a petition* = something which was a petition and not (not a petition)
33. *The professors didn't sign a petition* = NEG the professors signed something which was a petition
34. *The professors didn't sign a petition* = NEG the professors signed something which was a petition and not (not a petition).

As noted above we diverge from Bach's analysis of these sentences as it seems necessary to distinguish between 31 and 32 and the affirmative sentences 12 - 16, and Bach's analysis offers no suggestion as to how this distinction could be accounted for.

The foregoing arguments, if correct, seem to suggest that rules assigning intonation and so-called emphatic stress must be envisaged as global in nature, extending over either entire derivations or their parts. If the underlying structure contains a formula something like

$$X \wedge \sim(\sim X)$$

<sup>7</sup> Obviously no attempt has been made here to represent the negated elements in any detail.

then its surface realization will be referred to as emphasis<sup>8</sup>. The formula presents the elements to which X is contrasted as every non-X, and thus incorporates the claim made earlier that the emphasised items do not specify the element they are contrasted to but merely set everything else off (X and not anything that is not X) thus disallowing the structure underlying 35

35. *Tom has bought a summer-house and not a mink coat for his wife,*  
from being turned into 36
36. *Tom has bought a summer-house.*

It was mentioned above that 1 and 2 could be assigned alternative intonational patterns, say those below:

37. *Have you finished?*
38. *You've finished?*

Both of them seem to convey surprise, and to all intents and purposes they are no questions at all, i.e., they cannot be construed as containing a deep structure element like "I ask you" but rather they should be considered as equivalent to the statement

39. *I'm surprised that you've finished.*

An obvious suggestion to make here is that the three sentences should be derived from the same underlying structure containing elements that would correspond to the surface "I'm surprised that..." or the like. The rule assigning the proper intonation pattern should be similar to the one that applies in the case of ordinary declarative sentences.

Let us now consider other possible meanings that can be conveyed by intonation.

40. *She's pretty.*
41. *She's American.*

The fall-rise in 40 implies, according to Palmer (1970: 5), that prettiness is the only good quality she has got while no such implication at all is contained in 41. The examples prompt the question— why does the same intonation contour imply certain things in the former but not in the latter case? Quite obviously, because one is not normally inclined to say that she is American, and that is about the only good characteristic she has got. The fact that intonation

<sup>8</sup> The relation between phonology and semantics connected with contrastive stress has been noted by E. Fudge (1970: 94). He stresses that "the phonological difference between 'Give me that book' and 'Give me that book' does not correlate with anything syntactic but rather with a situational factor". The distinction between syntax and semantics is not so obvious as it used to be, so it is not so relevant to decide whether the phonological difference correlates with anything syntactic. It clearly does correlate with something semantic and not with a situational factor for the two sentences convey the semantic difference outside any situation.

in some cases can and in some cannot convey additional meanings is, trivially, connected with the availability of the meaning to be conveyed, or, putting it differently, with limitations on possible messages (cf. McCawley 1971 a : 217).

As a further illustration of this point let us have a brief look at O'Connor and Arnold's explication of the attitudes involved in their tone-group 5 (rise-fall) in statements. The attitudes involved are "impressed, awed, complacent, self-satisfied, smug, challenging, censorious, disclaiming responsibility" (O'Connor and Arnold 1961 : 147). Now the difference between, say feeling impressed by something and disclaiming responsibility for something or somebody is considerable, at best. In other words, if the same tune can express drastically different attitudes, what does it depend on? Can it express all the above mentioned attitudes in every case? If not, why not? Let us analyse some of their examples.

42. *She was wearing purple stockings.* <sup>^</sup>*Purple* (=impressed, awed).  
 43. *You'd better say you're sorry.* <sup>^</sup>*I'd better say I'm sorry* (=challenging, censorious).  
 44. *What a lovely cake. Who made it?* <sup>^</sup>*I did* (=smug, complacent, self-satisfied).  
 45. *Why did you pay in cash? They insisted on it* (=disclaiming responsibility).

Clearly 42 may express awe but not smugness or challenging, just as 45 may disclaim responsibility but it certainly does not involve complacency or self-satisfaction. Obviously it is as senseless to feel complacent about having paid in cash because somebody insisted on it as it is to say

46. *I feel complacent because they insisted on my paying in cash,*  
 or that somebody disclaims the responsibility of having made a cake that everybody likes as it is to say  
 47. *I disclaim the responsibility of having made a cake that everybody likes,*

These limitations have nothing to do with rules but rather with the possible message. The fact that intonation in one case conveys complacency and in another the feeling of disclaiming responsibility is strictly connected with the meaning of the sentence. It is precisely this meaning that imposes restrictions on intonational contours and their possible implications. One is not usually complacent because spring comes after winter and consequently the sentence

48. <sup>^</sup>*'Spring' comes after winter*  
 will convey no additional meaning to that effect.

It must be added that future studies on intonation are likely to take account of semantic structures within their contexts. To some extent this could be seen in the present day treatment of presuppositions and their function in assigning prosodic phenomena (cf. Lakoff 1971b : 63 ff). It does not seem too wild a guess to think that as more and more facts are considered, the present day

presuppositions will turn out to be inadequate or will grow to such an extent that they will amount to a description of the context in which a given sentence appears. It also seems possible that Halliday's (1970) "textual function" will prove to be of fundamental relevance in dealing with relations among units larger than the sentence.

Clearly almost any sentence taken on its own can mean a number of things. Disambiguation is possible only within some larger context. The present day insistence on the autonomy of meaning of the context seems unfortunate.

One is tempted to compare the interrelation of meaning and context as envisaged within modern linguistics to the views on the interrelation of grammar and sound in the interpretation of sound changes (cf. Postal 1968 : 240): autonomy — the meaning of the sentence is independent of the context (most of the TG studies); non-autonomy — some aspects of meaning can be accounted for by reference to the context (the notion of presupposition in the recent TG studies); inseparability — meaning is solely the function of the context (Malinowski, Firth).

To conclude: some parts of the semantic representations can be reduced to specific intonation and stress patterns by rule. These rules are global in nature as they must not be limited for their application to the surface structure only. Different attitudinal meanings can be reduced to a single intonation contour depending on the grammatical structure and on the meaning contained in the underlying structure. The latter point is in fact a repetition of the position that holds that different functions can be expressed by the same form and vice versa. Intonational studies must concentrate on both aspects not on the latter only as they have done so far.

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