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CONCRETE VS ABSTRACT PHONOLOGY

[ΛΕΥΚΗ ΣΕΛΙΔΑ]

In the framework of Generative Phonology the phonetic interpretation of sentences takes place within the phonological component of Grammar. The surface structures of the syntactic descriptions of sentences constitute the input to the phonological component. If, however, they do not coincide with the concept of the phonological underlying representations, they are modified by the application of the «readjustment ryles»[1] so as to become appropriate for use by the phonological component; the modified surface structures constitute the underlying representations. The phonetic representations will be derived from the underlying ones by the operation of phonological rules. The phonological component, therefore, consists of phonological rules which relate phonetic forms to their underlying phonological forms.

Phonetic representations are abstract in that they represent the phonetic properties underlying the physical actualization of sound which are arrived at, given the speaker's[2] hypotheses as to the surface structure of an utterance and his knowledge of the rules of the phonological component.[3] However this degree of abstraction cannot be disputed nowadays; rather, it has been superimposed by the development of scientific methodology, and experimentation.

Within this phonetic framework there are two distinct viewpoints: Postal (1968) claims that phonetic representations must function as the instructions indicating the method of performance of the physical system of articulation. While Postal seems to be concerned with articulatory rather than perceptual correlates, Chomsky and Halle's (1968) view embraces both correlates.

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1. It should be noted that this view is not a general one. Kiparsky, for example, questions the necessity of this operation

2. Understood in a neutral sense.

3. SPE-style analysis, Chomsky and Halle (1968).

What is at issue, however, is the degree of abstraction that should be allowed for the underlying forms. A consensus as far as this crucial point is concerned has not as yet been reached.

What one criterion determining any approach to this issue may be is a certain property attached to the grammar which is often called «simplicity». Commitment to this criterion will effect a maximization of the «value» of the grammar, which is the goal of our linguistic description. Underlying this concept is the assumption that there must be a notion of «value» or «simplicity» which will hold universally and which will eventually lead to a correct answer to the problem of the form of the underlying representations. Therefore, the validity of this notion must be based on empirical grounds. In setting up lexical representations we must take this notion into account so as to maximize the «value» of the lexicon and grammar (Cf. SPE[4]: 296, but see Chen, 1972).

Let us now consider the various forms assigned to underlying representations. The variable will be the degree to which they are removed from the phonetic surface. We would be in error if we were to relegate the whole issue to the plane of «abstractness» versus «concreteness» because, as Schane (1974:302) puts it, «phonological systems cannot always be likened to a clear running stream». Therefore there have been more than two approaches to the problem. One is the «concrete» approach: There should be a direct link between the underlying representations (morphophonemic representations) and the actual phonetic forms in which the morpheme appears in language. Such a representation should either be the set of the allomorphs or some form from which the whole set can be automatically recovered. This view determines the approach to the problem of all advocates of natural phonology.

Kiparsky, in his influential «How Abstract is Phonology» (1968, 1982) adopts a more or less «concrete» approach to the problem. Examining the notion of «neutralization» he distinguishes between two types of it: one is that allowed by the generative phonologists: phonological distinctions which are never realized on the phonetic surface appear in the lexical representations of morphemes: this kind of neutralization he calls «absolute neutralization» as compared to

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4. SPE: *Sound Pattern of English*, Chomsky and Halle (1968).

the second type which he terms «contextual neutralization». The difference between the two types of neutralization consists in the occurrence of the former irrespective of environment, while the latter, as the term indicates, takes place in a specific environment, in which the underlying distinction is lost; however the proviso is that the loss is restricted in that the underlying distinction is retained elsewhere. He gives some examples of contextually restricted neutralization rules: In Greek, a rule turns *ε* to *ο* in certain morphological contexts in which the distinction between underlying /ε/ and /ο/ is neutralized, e.g., «τρέπω», «τροπή».

Kiparsky cannot see any justifications for the existence of absolute neutralization. The alleged justification, as he sees it, is the purpose of classifying identical segments into classes which undergo certain processes and classes which do not. «Absolute neutralization», he writes, «is a consequence of setting up underlying distinctions for the sole purpose of classifying segments into those that do and those that do not meet the structural analysis of a rule» (1982, p. 128).

He criticizes generarive analyses of vowel harmony in Hungarian, in words in which the root contains only neutral vowels, because the underlying forms posited do not appear phonetically in those particular words. He calls this use of phonological features «purely diacritic». On Kiparsky's view, generative phonologists, in their attempt to generalize, treat all vowels uniformly while they should allow for special treatment for those classes of vowels which behave variously. Exceptions to linguistic rules should be designated in the lexicon by the use of diacritic features. However, he questions the use of diacritic features as exemplified in SPE-style phonologies. Rather, he claims, exceptions should be treated as regularities reflected in redundancy rules of the form:

$$[-\text{Rule X}] \rightarrow [-\text{Rule Y}]$$

The theory of generative phonology must be readjusted so that the diacritic use of phonological features, and the phonological use of diacritic features be excluded. «One of the effects of restricting phonology like this», he writes, «is to enter nonalternating forms in the lexicon in roughly their autonomous phonemic representations. That is, if a form appears in a constant shape, its underlying representation is that shape, except for what can be attributed to low-level, automatic phonetic processes» (p. 130). If morphemes which have identical

surface manifestations must have the same underlying representations, then a great deal of absolute neutralization is excluded. However, this is not the sole condition we should posit; on Kiparsky's view morphemes which are always phonetically distinct must not have the same underlying representations.

Let us, now, consider Kiparsky's argument levelled against absolute neutralization. If we assume that absolute neutralization does exist, he argues, then we make certain predictions about change in phonological systems, which are false; the theory of change cannot be adjusted in any general way so as to exclude these predictions. Therefore absolute neutralization does not exist. «Contextual neutralizations are *reversible*, *stable*, and *productive* whereas the alleged absolute neutralizations are *irreversible*, *unstable* and *unproductive*» (Ibid., p. 136). Neutralized features, in the concrete approach, are more or less *ad hoc* devices for handling exceptions.

How much abstraction is, therefore, allowed by the «concrete» approach advocates? The «morphophonemic alternation» is generally accepted as a justified reason for deviation from an autonomous phonemic representation since it enforces «relatively concrete analyses» which effect «the greatest generality and explanatory value» (Ibid., p. 160).[5]

It has been stated that if there is alternation on the phonetic surface, then one of the alternants should be the underlying form. For example, we assume that in French the underlying representation of an adjective is the phonetic variant with the final consonant. However, this is the weak version of the «morphophonemic alternation» (Schane, 1974), and it should be noted that the strong version of this reason is not acceptable by the «concrete» approach advocates as a valid reason for deviation.

Kiparsky (1968) states that «the alternation condition embodies a claim about *the importance of phonetics in phonology*. It leads to underlying forms which are closely tailored to their phonetic reali-

5. Here, we consider Kiparsky's approach to the problem to be «concrete» although he, himself, disallows both the «fully abstract» and the «fully concrete» morphophonemics, because, on his view, neither is capable of providing an adequate foundation for historical linguistics in general. When he refers to «fully concrete morphophonemics» what he has in mind is Trubetzkoy's morphophonemics and the «item-and-arrangement» approach adopted by American Linguists.

zations» (1982:159). He draws a parallel in syntax where the importance of semantics has been recognized. The evidence which is available is not sufficient to permit us to construct abstract, theoretical models; the sole levels for which there is sufficient evidence available are the «concrete» levels of phonetics and meaning.

The diametrically opposed view to the «concrete» one is the completely abstract view held by phonologists like Lamb and Fudge. In this approach morphophonemes should be «completely abstract» elements; they should have absolutely no properties which are even remotely phonic (Fudge, 1967). The phonological level is logically independent of the various phonetic levels and the relationship obtaining between the two should be investigated by the phoneticians.

Fudge proposes that we have rules of «realization» whose simplicity will be directly analogous to the degree of abstractness of the «systematic phonemics» level. Implicit in this view is the notion that the statement of these rules should be independent of phonetic facts which will be accomodated within the frame of our rules. We can thus construct a universally statable phonological system within which phonetically diverse dialects can be accounted for. The justification for this approach is that we would rather have a universal phonological system —no matter how abstract this might be— which will be our departing point in our attempt to account for the phonetic level of a language, than have a phonetically based approach to phonology, which will lead us to diverse phonemic levels for each dialect. Realization rules will handle all alternations, while mutation rules will enable us to state the articulatory correlates of certain elements and will also handle anomalies.

What is the motivation for such an abstract approach? Fudge considers the nature of the Jakobsonian distinctive features: are they articulatory or auditory? If they are auditory then they are recognition-oriented and the articulatory correlates may be more than one: e.g. (+Flat) may indicate lip-rounding or pharyngalization or retroflexion. Therefore, a more precise specification is needed. Further, some of the articulatory features are redundant in so far as they are not crucial for recognition. In English, for example, the articulatory features distinguishing dental from alveolar must be specified only for fricatives. The Jakobsonian distinctive features do not provide «a universal framework» at the systematic phonetic level.

Fudge, therefore, concludes that «phonologists... ought to burn

their phonetic boats and turn to a genuinely abstract framework» (1967, p. 26). An example of how abstract the morphophonemic level is envisaged by Fudge is provided, when he claims that «there seems no reason why we should not say that /r/ is functionally voiceless, though phonetically voiced» (ibid., p. 31). Adopting a completely abstract approach, Fudge succeeds in maintaining «neutrality as between the auditory and the articulatory [elements]» (ibid., p. 3). Chomsky and Halle, however, implicitly criticize Fudge for failing to distinguish between the abstract phonological features and the concrete phonetic scales of the Jakobsonian distinctive features (1968: 297 n).[6]

The third approach, adopted by Chomsky and Halle, Hyman, Jakobson and others, lies between the two, and combines the ideas implicit in the concrete approach with the ideas of the fully abstract approach. This approach is still «permissive» in that «the representation of a lexical item as a feature complex may he perfectly abstract» (Chomsky and Halle, 1968: 298) provided that the notion of the maximization of the value of the grammar enters into the determination of underlying forms. Distinctive features at the phonemic level do have a classificatory function (Fudge), but Schane (1973) claims that any approach which ignores the phonetic content of the phonological distinctive features, fails to recognize the direct correlation between the underlying and the derived forms. This statement is implicit in Chomsky and Halle's analysis. This approach seems to enable us to plausibly account for more phonological phenomena.

By allowing abstract constructs our lexicon is not enlarged; moreover, our phonological rules tend to highlight, rather than obscure, the underlying structures. The abstract forms which are processed to the phonetic forms, by the application of the rules, often reveal processes of language. This approach is also more flexible in that it can account for phonological phenomena in a way that generalizations are captured, and hence «simplicity» is maximized without losing contact with the phonetic level.

In this approach the underlying representations are abstract in so far as they «exhibit structural regularities» which may not always

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6. Detailed criticism of the abstract approach to the problem can be found in Postal (1968).

appear in the phonetic representations. The underlying form is usually one of the phonetic alternants, as in the example of the French adjectives. However, this is not always the case; we are often led to the postulation of an underlying phonological representation which does not appear at all as a derived form and, hence, the underlying form is even more abstract. For example, Hyman (1970) was able to plausibly account fot phonological phenomena which appeared to be irregular at the systematic phonetic level solely by postulating two «vowels» at the abstract, phonological level, which had no distinct phonetic realization. He thus showed that these phenomena were instances of general processes operating in the language. This abstraction is allowed in SPE-style phonologies. In fact all reasons for deviation (abstraction) as presented by Hyman (1970) are allowed in SPE-type phonologies.

Hyman (1970) claims that an abstract[7] approach to phonology may provide the most highly valued solution to a phonological problem. A more concrete approach may prove incapable of capturing all significant linguistic information. Thus a considerable degree of abstractness in phonology may be justified. This is not to imply that the abstractness accompanying representations and, consequently, phonological rules, need not be «well motivated», in other words, justified. It should actually have a simplifying effect on grammar. Furthermore, rules accounting for the derivation of the phonetic forms should not be simply devices for generating variants of a form. Rather, they should reveal linguistic processes. Abstract underlying forms often function explanatorily in that they account, at the abstract level, for forms which appear to be anomalies at the phonetic level.

The justification for the need of the abstract phonological representations is given in SPE:

> If we chose to represent each lexical item by the set of its phonetic representations, we should be treating all phonetic variations as exceptions and would, in principle, be unable to express within our grammar the phonetic regularities and general phonological

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7. Here, Hyman is not referring to the fully abstract approach adopted by Fudge.

> processes that determine phonetic form;...many of the most general and deep-seated phonological processes cannot be formulated as rules that directly relate phonetic representations; rather, these processes presuppose underlying abstract forms (p. 296).

The postulation of abstract forms, however, should be «more than compensated for by greater overall simplification» (ibid., p. 296). At the abstract level we are interested in knowing whether a particular feature is attributable to a particular segment. At the phonetic level we are concerned with the absolute phonetic qualities of segments. The implication of this argument is that underlying representations have «phonetic» content. Classificatory matrices, therefore may be submatrices of phonetic matrices but this need not always be the case.

This approach seems to combine the virtues of the other two. The justification for the fully abstract approach collapses if the distinction between the abstract phonological features and the phonetic features is recognized. The concrete approach tends to be too rigid; it is not capable of accounting for many exceptions to general rules and conditions, since it does not allow the postulation of a deeper, more regular pattern. If such exceptions start finding their way into the lexicon under the rubric of diacritics, then a disquieting increase of the items in our lexicon is inevitable; a cupboard of «sundries» is not desirable in our grammar, but, should this prove unavoidable, its contents should be kept to a minimum. Besides, the postulation of abstract underlying forms often tends to reveal rather than obscure the structure of the language. Therefore, there will be cases, in a more rigid approach, where the internal structure of the language will remain obscure.

Another approach lying between the «concrete» end and the SPE-style phonologies has been developed by Schane (1974) who, by positing segments within a phonological space, tried to have «the best of both worlds - the advantage of the concrete analysis where there is a closer rapport between underlying and surface forms while at the same time retaining the structural *insights* of the abstract approach» (p. 314).

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