How abstract is Phonology: Paul Kiparsky

Presented by

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Kiparsky begins this paper with a resounding question: What is the form of morphophonemic representations? How far removed are they from the phonetic or phonemic surface?

Three positions are presented:

1. The Concrete View - “The morphophonemic representation should provide a direct record of all the actual forms in which the morpheme appears. The underlying form of a morpheme is nothing but a set of its allomorphs, or some representation from which that set can be immediately constructed.”

2. The Abstract View - “Morphophonemes are ‘completely abstract’ elements. They possess no phonetic properties.” In this view, these representations exists of “completely neutral labels” which should be “constructed ad hoc for each language.” In a more extreme manner of description, Fudge argues “phonologists ought to burn their phonetic boats and turn to a genuinely abstract framework.”

3. The Combinatory Approach (Process morphophonemics) - This type of theory recognizes that there is an underlying phonological pattern not identical to the phonetic level, but also that this pattern is not arbitrary, and bears some relation to the phonetic level. A revealing example is the /ng/ → [ŋ].

Kiparsky states in regards to these theories, “Given that there are sounds (or phonemes) and that there are morphemes, there really are no other, greatly different, ways in which one could imagine them related than the three kinds of theories into which current opinion exhaustively seems to divide.” Does the class agree with this outlook? Are there any other ways in which one can imagine the relationship?

Objections to the Combinatory Approach:

- Linguists have begun using the Combinatory Approach as a result of influence by diachronic linguistics, which looks at phonetic forms at one point in time and compares them with the phonetic forms from another.
- Linguists represent the morphophonemic level with the IPA, leading to the idea that this level is not being kept distinct from the phonetic level.
- Only abstract linguistics allow one to “maintain neutrality between the auditory and articulatory (elements).”

What does this third criticism refer to?
“If morphophonemes are arbitrary, diacritic symbols, then no general universal statements about the structure of underlying forms are possible. (P.8)”

In this sense, if for example we did not draw a distinction between consonants and vowels, we would not be able to see the universal idea of syllable structure. Abstractly, there are only arbitrary diacritics with no permanent specifications, which are not part of the structure. Thus, one cannot look at universals of morpheme structure.

Objections to the Concrete Approach:

This approach “generalizes to all morphophonemic alternations procedures which are at best suited to handle a particular type of exceptional case. (P.9)”

The “president” example: [prɛzɪdɛn] [t], [ʃ], [s].

Another example is the lack of need to specify alternants to word final stops in German, we can just apply a devoicing rule.

2. Russian Palatalization: Implications for these Theories

From here, Kiparsky speaks about neutralization briefly, pointing out that in some cases /A/ and /B/ will neutralize and appear on the surface as [B] due to a rule “P”. His point in mentioning this, though, is that we can use this rule to make a determination as to what the phonetic form reflects on the underlying level.

In Russian we see two rules:

(1) Palatalization (t, d, s and k, g, x, become tʃ, dʒ, ʃ)

(2) Spirantization (dʒ becomes ʒ)

We see the following derivations:

![Diagram](image)

And in words:

![Diagram](image)

However, at a certain point the spirantization rule stops occurring! So the underlying /d/ stopped being converted to the [ʒ].
“Every instance of [ʒ] which is derived from /d/ is changed in the same way because the change is an abstract rule of the grammar.”

The morphological approach would simply change all the entries, so any change would be “structurally indistinguishable” from what actually occurred.

Now with the abstract approach:

(1) a. % → /ʃ/ in the palatalising environments
(2) a. % → /ʃ/ in the palatalising environments
(3) 1/4 → /z/

Because this approach considers the symbols arbitrary, one merely needs to change subrule 1a to /ʒ/. However, there is no reason that causing % to change to [s] in this way is any less natural!

3. The Alternation Condition

Definitions:

Neutralization- the merger of distinct representations
Absolute Neutralization- Neutralization which takes place regardless of environment
Contextual Neutralization- Neutralization in which an underlying distinction is lost only in a specific environment and retained elsewhere.

Rider and writer is an example of contextual neutralization. /t/ and /d/ are neutralized medially before an unstressed syllable, but retained elsewhere.

The Russian example earlier is also contextual neutralization.

One form of absolute neutralization which can occur follows:

A → B / _C

The segment C is said to have underwent absolute neutralization if there are certain instances where before C the change A → B does not occur, however where the environment C is indistinguishable from where it does happen. From here, one simply asserts that there is a rule D → C in the grammar, thus saying that underlying D changes to C after the original A → B rule is applied.

4. Vowel Harmony and Abstractness

In vowel harmony, specifically Hungarian, the vowel harmony can sometimes be determined phonologically. However, when neutral vowels occur, one must posit an underlyingly unrounded back
vowel in the words, which then undergoes absolute neutralization with the underlying front vowels, forming the phonetic form. So, here we see a UR which does not appear on the surface.

Kiparsky defends an alternative to this, representing vowel harmony phonologically, but using diacritic features where “harmonically distinct but phonetically identical neutral vowels must be distinguished.(P.16)"

A second alternative is to use a diacritic feature for vowel harmony. In this sense, the process is treated as a quasi-phonological rule which distributes the diacritic “harmony” feature starting from the root to the entire word. Later, another rule determines whether an underlying vowel is front or back depending on which diacritic they are marked with.

Interestingly, he recommends treating them as exceptions, thus noting that a morpheme with an opaque vowel has the feature [-vowel harmony] to explain why suffixes added to it do not undergo the process.

Kiparsky points out that within generative phonology, which explanation one chooses is an arbitrary one, because “the evaluation measure assigns no relative weight to rule features versus phonological ones.(P.17)"

“It is a very natural, though theoretically unjustified, desire to have synchronic descriptions reflect diachrony to the greatest possible extent. (P.17)"

“l will propose that the theory of generative phonology must be modified to exclude the diacritic use of phonological features, and the phonological use of diacritic features.(P.18)"

What does this restrict?

- Forms appearing in a constant shape possess URs of that shape, except for the portions which can be attributed to phonetic processes. This excludes a large number of absolute neutralizations.
- Morphemes which are phonetically distinct must have different URs. This prevents root markers from cutting the number of vowels in a phonemic inventory. (Actually, it seems Kiparsky wants to go further, and prevent rule features entirely here).
- A suggested restriction is also given for rule features, not allowing them to apply to particular morphemes or segments by “readjustment rules.”

What is a readjustment rule?

Kiparsky recommends that instead of these readjustment rules, we use rule features, potentially in the form:

[-Rule X] → [-Rule Y]

An example from Russian originally devised by Halle is presented to demonstrate the rule features:
Halle argues that the distinction between /ɔ/ and /æ/ as well as /o/ and /e/ has been lost, but the vowel [ɔ] is still causing the raising to [i]. Halle argues that because of this, in order to avoid the distribution of the pretonic vowel becoming “hopelessly complex,” one must add a rule to the grammar which states that [(e, o) → (æ, ɔ)]

Instead, Kiparsky recommends that /ɔ, æ/ be marked as exceptions to the first rule ([-Rule X]), so that they by default undergo the second rule.

A similar solution is presented to an issue in Sanskrit where a palatalization rule occurs for segments before /a/. However, this /a/ represents a neutralization from two different segments, /e, a/. Kiparsky suggests a similar exception rule to the /a/, with those elements within the lexicon which do not cause palatalization being marked with the same rule feature as before.

Kiparsky argues that phonetic plausibility, the fact that there are different SR’s depending on the “type” of /a/, could be invoked. Thus, one would need a distinction between /e/ and /a/ to distinguish between these two analyses. But of course, we cannot explain this synchronically. There is no underlying difference between the /a/ which triggers palatalization and that which does not.

Next, the argument is presented that one make it a phonological universal, that “palatalization rules cannot have /a/ as their environment in any language, but only front vowels. (P.23)” This claim presents issue because one would need to find evidence to determine its truth.

Kiparsky argues that the issue with this is that “it is always possible to find ‘vacant slots’ which allow the distinction to be set up so as to make the rules become phonetically natural. (P.23)”

What is he referring to here?

“My view is that each of these analyses is wrong, and has to be rejected even within the theory of phonology proposed by Chomsky and Halle.” (P.22)

5. Historical Arguments against Absolute Neutralization

Kiparsky’s reasoning:

From the assumption that absolute neutralization exists, certain predictions about change in phonological systems follow → These predictions are false → The theory of change cannot be adjusted in any general way to exclude these predictions → Therefore absolute neutralization does not exist
Contextual neutralization is reversible, stable, and productive, while absolute neutralization is the opposite.

**Reversibility**

The reversal of contextual neutralization is called “leveling.” It takes place as a result of a simplification of a rule, the elimination of a rule, or by a re-ordering of rules.

An example of this is the undoing of a neutralization in German, by turning /a/ to /æ/. This prevents the neutralization of /e/ and /e/ which occurred as a result of the /a/.

This is contrasted with absolute neutralization, such as in the case of vowel harmony, where there is never a reversal of the neutralization. For example, Kiparsky points out that he has never seen “a vowel harmony language in which harmonically distinct neutral vowels have split up phonetically. Kiparsky proposes that if absolute neutralization really exists, “why cannot it be undone (P.26)”? He concludes that it must not exist.

**Stability**

It is also asserted that the contextual neutralization is more stable than the absolute variety. He argues that “there seems to be no particular pressure to adjust the system in this or any other way.(p.27)”

The opposite is true, Kiparsky argues, for absolute neutralization. He points out that when a sound change causes an absolute neutralization the nonphonetic environment of the rule is changed quickly to “a transparent, phonetic, or morphological environment.(P.27)”

His evidence for this is Classical Mongolian’s former words with only neutral vowels, which took back vowel suffixes. He points out though, that today, all these words now take only front vowel suffixes. For example, /idmeer/ would be a possible form, but not /idmaar/. This, he argues, is because /i/ is a front vowel. The alternation condition from earlier allows the words which cause this odd back vowel harmony to be marked as “exceptional front vowel words” instead of back vowel words being fronted later.

**Productivity**

“Whatever is exceptional about loanwords is normally due to unassimilated features of the source language, and not to any contributions by the borrowing language. (P.29)”

Kiparsky concludes based on this statement that stems with /i/ and /e/, those that take the endings with back vowels are exceptional, a closed class, and that any new borrowings are assigned to the expected front-harmonic group.

According to Kiparsky, nothing explains the above issue unless we incorporate the alternation condition into phonological theory.
Summarily, “The rules which are presupposed in such constructions stand out from other rules by not functioning in any way in language change. The systems in which they would be set up are characteristically unstable, and the classes of morphemes involved are closed and unproductive. (P.29)”

6. The Strong Alternation Condition

“The question arises whether cases of absolute neutralization which do not lend themselves to reanalysis by means of rule features, or do so only at some exorbitant cost, ever occur in languages. (P.30)”

Weak Alternation Condition- The alternation condition is a clause of the evaluation measure which says that absolute neutralization is linguistically complex.

Strong Alternation Condition- The Strong Alternation condition seems to represent a situation where the rule feature analysis is always better than the phonological feature analysis (absolute neutralization).

7. A Return to Vowel Harmony

The question in this particular section centers around how roots are categorized. Kiparsky argues that it has been assumed that the rule determining vowel harmony in suffixes also specifies the harmonic feature in the root vowels.

This aforementioned argument dictates that roots are underlyingly abstract as well as the suffixes, and that a rule simultaneously determines the vowel harmony they will take.

The other argument is that a single vowel in the root is specified, and that the harmony arises from that specified vowel.

Kiparsky states that these will have to be re-examined because of the theory of markedness, which states that “dictionary representations are fully specified for every phonological feature.” This theoretical idea seems to be built on the idea of phonotactics, or as Chomsky and Halle state, “the conditions which determine the well-formedness of dictionary representations must refer to predictable phonological features.”

So what does this mean for vowel harmony?

Instead of the old underspecified system, the vowels must be totally specified in the root. Kiparsky argues that this analysis is the only way to enable certain changes to be formulated as systematic changes in the grammar. Observe how this functions with the following system of Finnish, which diphthongizes certain vowels:

If the other analyses are used, we would not see a different result of the rule ordering.
As a second criticism of these theories, Kiparsky points out that they attempt to account for both root and affix harmony by a single rule, but because they have different sets of exceptions, they are actually different processes. See P. 35 for examples.

So, he concludes, there are two structural manifestations to vowel harmony: 1. A morpheme structure constraint excluding the co-occurrence of back and front vowels within morphemes. 2. A rule which makes the vowels of suffixes fronted if the last non-neutral vowel of the root is fronted.

The markedness theory to some extent allows for the alternation condition, insofar as the general approach used by this theory makes the alternation condition’s solution feasible.

Returning to the original issue of the neutral vowels, if one is to use the analysis where the first vowel is specified, and the rest are not, then an abstract phoneme must be posited specifically for these words. For example, /vəlkA/ and /selkA/ where the schwa is a nonphonetic back unrounded vowel. These eventually have to collapse with /e/ to form /velka/ and /selka/.

Kiparsky’s point here seems to be the utter irregularity with which these abstract phonemes are used. They create an effective MSC wherein when one of them is present, an archiphoneme must be present later in the word. Thus, for them to be necessary in a single phonological analysis seems odd.

This is in contrast to what occurs if one sets up /i/ and /e/ as the underlying neutral vowels. If this is the case, then the distribution becomes far more natural, and there is no need for an abstract phoneme.

Next, the other analysis in which there is a root marker spreading the vowel harmony is analyzed. While the original analysis hinged on the idea of efficiency, that in Mongolian one could collapse vowel harmony and velar assimilation into one rule, Kiparsky points out that this actually causes velars to be incorrectly back in articulation before /i/ in certain scenarios. Thus, instead of two rules, one needs three:

1. Vowel harmony
2. i → i
3. Velar assimilation

As a result of consonantal harmony being present in other languages, Kiparsky argues that both it and vowel harmony are actually forms of assimilation, and so he sees evidence for combining velar assimilation and vowel harmony in Mongolian. As a result, he believes that consonant assimilation is also required by the alternation condition.

Another criticism of the root marker theory is that it uses an abstract feature [GRAVE] which is always mapped onto the feature [back], although there does not seem to be an underlying connection between the two features; it is not natural.
A worthwhile point to bring up here is the presence of criticism of long distance assimilation. It seems that Zimmer objected to the idea that a long distance rule has to pass by intervening consonants.

“Some convention is needed which allows rules performing a certain operation to allow phonological elements which are irrelevant to this process to occur freely interspersed in a string which meets their structural analysis. (P.43)”

One interesting possibility he mentions is to exclude elements of lower sonority than those targeted in the rule.

**Nez Perce Vowel Harmony:**

There are two harmonic sets in Nez Perce, dominant and recessive:

<table>
<thead>
<tr>
<th>Dominant</th>
<th>Recessive</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>æ</td>
</tr>
<tr>
<td>o</td>
<td>u</td>
</tr>
<tr>
<td>i</td>
<td>i</td>
</tr>
</tbody>
</table>

In an odd parallel to genetics, recessive vowels become dominant in suffixes when dominant vowels appear in the root. There is also a neutral vowel /i/. As per the previous examples, the abstract analysis posits abstract vowels to account for the neutral vowel, and then follows with a root feature. The concrete analysis splits the neutral vowel into two underlying segments, and ends up with six underlying vowels. Finally, the alternation condition analysis states that there are five underlying vowels, and that vowel harmony is actually phonologically conditioned, except for /i/.

The three solutions are formalized below:

First, the abstract:

\[
(+ \text{segment}) \rightarrow (+ \text{dominant}) \{ \# X \{+ \text{dominant} \} Y \rightarrow Z \{+ \text{dominant} \} \ W \# \}
\]

This can be simplified in one environment to

\[
(+ \text{segment}) \rightarrow (+ \text{dominant}) \ # \ X \{+ \text{dominant} \} \ Y \\
\]

And finally, to the point that it turns /a/ to /æ/ in [-dominant] words, and /u/ to /o/ in [+dominant] words:

\[
\text{v}_Y \rightarrow \begin{cases} \text{[- back]} & / ( + \text{low} ) \\ \text{[- high]} & / ( + \text{back} + \text{dominant} ) & \end{cases}
\]

This is followed by the concrete solution, with the six underlying vowels:
Finally, the alternation condition solution:

By examining a related language, Sahaptin, we can also see the chronology of the linguistic split. This is because we know that there is a neutralization in Sahaptin while there is not in Nez-Perce. Absolute neutralization can only occur in one direction, so we know that Sahaptin vowels predate Nez-Perce.

From here, Kiparsky defends a given reconstruction of Sahaptin, and compares it with a language with a parallel vowel harmony system from Siberia to demonstrate that there is a typological naturalness to the way in which vowel harmony functions, and that even among languages which are not related a diffusion of vowel harmony rules occurs.

7. A Brief Conclusion

“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 realizations. Quite analogously, recent work in syntax is showing the importance of semantics in syntax, and is leading to deep structure representations which are close to semantic representations. It is only to be expected that progress in linguistics should consist of reducing the abstract part of language, the part consisting of the various theoretical constructs which must be set up to mediate between the concrete levels of phonetics and meaning, the only aspects of language which can be directly observed. (P.52)”