

Some remarks on “minimal pairs”

by Daniel L. Everett

© 1982 Summer Institute of Linguistics, Inc.

Originally published as:

Everett, Daniel L. 1982. “Some remarks on “minimal pairs”.” *Notes on Linguistics* 22:.

[Keywords: minimal pair]

Contents

1. Introduction

2. Theoretical and practical considerations

3. Conclusions

References

1. Introduction

The purpose of these remarks is to remind fieldworkers that in linguistic science, analyses and hypotheses are supported by consistent general statements of (falsifiable) principles derived from an entire corpus of data and not by aprioristic assumptions of “certification.” I am prompted to write this by (a) personal experience (compare 2.3. below) and (b) a recent note in *IJAL* by Herbert Landar (*IJAL* 46:228) who says, “as with vowels and consonants, so with stress, pitch, and juncture: one minimal pair certifies phonemic integrity.”

Those of us who had the good fortune to first encounter linguistics in the environs of Norman, Oklahoma (and its innumerable pizza parlors) remember well the joy of solving phonological puzzles on the basis of that heuristic duo, “CIE” and “CAE” (contrast in identical/analogous environment[s]). Unfortunately, through such experiences as well as through the general development of American phonemics, many linguists work under what is to me the distressing notion that a “minimal pair” (a phonemic concept) can be applied as though it were a phonetic absolute, a preanalytical shortcut or a postanalytical proof.

I submit that even a cursory review of current linguistics theory (for example, tagmemics or generative phonology) will quickly pull the theoretical rug out from under this assumption.

2. Theoretical and practical considerations

2.1. Tagmemics

If Pike has said it once, he has said it a thousand times, human behavior may be observed from three perspectives: static, dynamic, or relational (as particle, wave, or field). My exegesis of Pike’s treatment of minimal pairs is that these are merely a static perspective of a particular phenomenon and, thus, not a theoretically sufficient evaluation. (The question of whether a linguist controls his data well enough in the initial stages of his fieldwork to presume that he has eliminated all but one of the variables in a pair of lexical items is relevant but not crucial to my point. This does remind us however, that “minimal pair” is not a phonetic concept.)

Moreover, Pike has been generally consistent in his pedagogy, viewing minimal pairs as helpful but not foolproof checks on analysis. For example, “... segments should, where possible, be separated by contrast in identical rather than nonidentical but similar environments, since the analysis in identical environments is much less liable to error” (1947:81a).

One statement does strike me as too strong however, in light of Pike's own theory: "... [minimal pairs] prove to be the beginner's single most important tool for the analysis of phonemic differences" (1947:82a). Obviously, this is an example of theory taking a back seat to pedagogy. Such statements form the background for the type of problem I encountered in my own fieldwork (compare 2.3).

Nevertheless, to infer that in tagmemics the discovery of minimal pairs precludes the need for further analysis or that it "proves" an already formulated hypothesis is to do injustice to tagmemic theory in particular and linguistic research in general.

2.2. Generative phonology

In his vitriolic but important monograph of 1968, Paul Postal points out that a major weakness of autonomous phonemics is its inability to allow exceptions. This observation has several applications, but the situation I am referring to here is where linguistic generalizations are either not observed or not described because of an apparent minimal pair contrast. Specifically referring to minimal pairs, Postal quotes Chomsky and then proceeds to offer his own comments.

"In general it should be observed that 'minimal pair' is not an elementary notion. It cannot be defined in phonetic terms but only in terms of a completed phonemic analysis ..." (Chomsky 1964:97).

And Postal himself says, "... contrary to almost every introductory exposition of autonomous phonemic theory or practice, the discovery of phonetically minimal pairs does not necessarily [emphasis Postal; D. E.] permit an immediate conclusion about underlying phonological contrast" (28).

Postal goes on to argue, to me successfully, for the necessity of basing analyses on systematicity rather than "static" exceptions. He does not eliminate minimal pairs from analysis, but rather brings the principle of their application into proper perspective. Chomsky and Halle develop this notion further, as seen in statements such as: "Clearly, we must design our linguistic theory in such a way that the existence of exceptions does not prevent the systematic formulation of those regularities that remain" (1968:172).¹ What is clear from these early quotations from GP is that regularities are the basis for linguistic analysis (this being, among other things, an assumption on competence). Minimal pairs might, in fact, illustrate such regularities, in which case by all means use them. On the other hand, they might be useful in creating doubts. Doubts refine hypotheses. But doubts do not require, say, complete redesign of an orthography on the basis of two words.

On this point, tagmemics and generative phonology show some agreement. No theoretical "slot" has been reserved for "proof texts." As in hermeneutics, so in linguistics, context is crucial.

2.3. Empirical and epistemological extensions

2.3.1. Empirical consequences

This problem has various empirical consequences. Let us consider the following examples.

2.3.1.1. Pirahã

[Keywords: Mura-Piraha (Brazil)]

The major catalyst for this verbage was my experience in reanalyzing the basic tonal levels of a particular language, Pirahã. Previous analyses had based themselves primarily

on series of minimal pairs, closing (in my opinion) the phonological ledger too soon as a result.

The following are some examples used to support the previous analysis proposing three phonemic tone levels.

- (1) [ʔa^aòí] MLH ‘hand’ H, ’ = high tone
- (2) [ʔa^ao^ai^a] MMM ‘ear’ M, - = mid tone
- (3) [ʔà^{aa}i^a] LLM ‘foreigner’ L, ‘ = low tone
- (4) [ʔàòí] LLH ‘skin’
- (5) [ʔa^aòì] MLL ‘Brazil-nut shell’
- (6) [ʔa^aóí^a] MHM ‘basket’

In a theoretical framework which allows “minimal pair shortcuts,” it is clear that (1)–(6) argue strongly in favor of a three-tone analysis.

Closer examination of this series, however, reveals that between the [0] and [i], in each of these examples a semivocalic glide [w] occurs. This is rather uninteresting phonetically since such a glide is pretty much expected in this position for obvious reasons. However, as any first-year linguistics student knows, such a glide has (at least) three possible interpretations.

- a. This could be perceived as simply a trivial transition effect, needing nothing more than a footnote.
- b. The glide could be functioning as a consonant /w/ in the language.
- c. This [w] could in fact be a vowel in underlying representation.

The determination of which option a–c is correct will have serious implications for the analysis of Pirahã. But note that this determination is heuristic for such a choice. In my analysis, option c was selected. This not only allows for prediction of stress placement, but notice the change in the tonal patterns of (1’)–(6’) (where [w] carries tone because it is an underlying vowel. Compare Everett, Forthcoming, for details.)

- (1’) [ʔa^aòwýí] MLHH ‘hand’
- (2’) [ʔa^ao^aw^ai^a] MMMM ‘ear’
- (3’) [ʔàòw^ai^a] LLMM ‘foreigner’
- (4’) [ʔàòwýí] LLHH ‘skin’
- (5’) [ʔa^aòwýì] MLLL ‘Brazil-nut shell’
- (6’) [ʔa^aówýì] MHHL ‘basket’

Space does not permit a discussion of the tone rules which follow from such a decision. Suffice it to say that this phonological decision rendered the “raw” data interpretable to a two-tone analysis, simplifying the grammar, orthography, and so forth.

2.3.1.2. Tonal displacement

A further example of the empirical consequences of a minimal pair analysis may be seen in languages which manifest what has been termed “tonal displacement”:

... Richardson (1971) discusses a phenomenon which he calls displacement, whereby tonal contrasts are realized several syllables to the right of their original position. The words [ný-kòlò] ‘sheep’ and [ný-kòlò] ‘heart’ in Sukama should differ, in that ‘heart’ etymologically carried a high tone on the last syllable. Both are pronounced identically in isolation, however [emphasis mine, D. E.]. Compare, though, the following forms:

ný-kòlò ný-tàalè ‘big sheep’
ný-kòlò ný-tàalé ‘big heart’

The original tonal contrast is realized on the adjective big (Hyman and Schuh 1974:103).

The authors proceed to give a feasible account of this phenomenon, with sheep and heart contrasting in underlying form. Note that such an analysis would not be possible in a structural framework wherein minimal pairs are phonetic units “certifying phonemic integrity.”

2.3.1.3. Portmanteau

One final example in support of the thesis expressed in this paper is the phenomenon known as “portmanteau.” A discussion of this is found in E. V. Pike (1974a:24):

A portmanteau phone (caused by the wave characteristic of language) is one etic sound which is emically two phonemes. A unique phone, the one not part of a symmetrical pattern [emphasis mine, D. E.] may turn out to be a portmanteau phone. When the units which make up the portmanteau phone are recognized, their occurrence should help to make symmetrical one of the nonsymmetrical patterns.

Before citing Pike’s examples, note what was said earlier (2.1) about minimal pairs as a “static perspective” in Pike’s model. Obviously, tagmemics requires analysis to proceed evaluation of minimal pairs, else how are we to see whether a pattern is symmetrical or not? Yet, tagmemic pedagogy, as was also noted earlier, has not been clear on this point. Pike gives the following examples (among others):

Harris (1951:92) describes a flapped nasal which occurs in some environments in some dialects of American English (as in, for example, painting) as actualizing the sequence /nt/.

In Quiotepec Chinantec, the sequence /mĩ/ is actualized as a syllabic bilabial nasal (Robbins 1961:245).

In Ayutla Mixtec, the sequence /æ/ is actualized as [æ] when following an alveopalatal consonant (Pankratz and Pike, E. V. 1967:289)....

Further, in her Advanced phonology workbook, Pike gives several problems of this nature (for example, Number 25) which never fail to stymie students looking primarily for minimal pairs. Such puzzlement often carries over into actual field analysis.

2.3.1.4. Discussion

One might possibly respond to this data by saying, “Well, your initial minimal pairs were incorrect. As a matter of fact, once the proper forms were defined the contrast became obvious.” But surely the fallacy of this argument is clear. The “correct form” of these minimal pairs was determined phonologically, not phonetically. That is, no phonetician could have told us that the semivocalic glide from [o] to [i] in the Pirahã data was an underlying /o/ (which carries tone). Nor is the phonetic data sufficient to determine the presence of a displaced tone in the Sukama examples. Portmanteau is even more revealing.

In these examples, if the analyst had stopped with the superficial phonetic form he could, according to structuralist methodology, have considered that:

- a. Pirahã has three tones and (by further data) unpredictable stress placement.
- b. Languages like Sukama have arbitrary allomorphs in grammatical sequences.
- c. Languages with portmanteau phenomena have arbitrary patterning in their phonemic inventories.

This type of data further illustrates the difficulties and dangers of minimal pair analysis for Longacre's "OWLS" (ordinary working linguists). Carrying the conclusion a step further, we might even say that a good analysis should determine minimal pairs rather than vice-versa.

2.3.2. Epistemological extension

As an epistemological aside, it might be noted that minimal pairs represent the effects of empiricist philosophy in linguistics. That is, they are the vestiges of the naive notion that "proofs" exist in science, in general. As Chomsky has frequently observed, data by itself is not sufficient for criticism of a given theory. Rather, one must say something about the data, which, by its very nature, is a theoretical activity. To criticize analysis a, for example, it is not enough to merely present contrary data. It is also necessary to (1) show how an analysis b would treat the data more effectively, and (2) how analysis a cannot be extended to handle this "extra information." Pure inductivism is a dead-end road.

In astronomy, a researcher might criticize a colleague's theory by noting that light rays and planetary motion in a particular section of the galaxy do not conform to this colleague's theory. Then the colleague may simply respond by saying, "Well, there's this thing called a 'black hole' up there which, although invisible, exercises an effect."

So, let's get some money from NASA and send up a rocket to check out the story. No black hole! Now we've got him! But, when presented with this new evidence, the shameless fellow replies, "You didn't find evidence of a black hole because your instruments were fouled up by magnetic clouds in the area (this example is largely from Marcelo Dascal, verbal communication).

This type of thing can go on and on unless colleague b gets fed up and says, "Listen—I have had it with your old fairytales. I have developed a theory which explains all of these phenomena, simply and satisfactorily without black holes, magnetic clouds, and so forth."

So it is with minimal pairs. They are only acceptable as evidence within a theory. The lack of a theory rules all of the data in the world irrelevant.

As a final example, consider the work being done on conversational analysis by certain sociologists. These people have put themselves in the hopeless position of maintaining that: (1) it is possible to describe the data as it really is with little or no bias. This description thus far has shown us that people talk by taking turns. Therefore, (2) we expect to find a turn-taking mechanics in the organization of future conversational data (this would be considered a proposed universal by linguists but the sociologists reject this terminology).

But if I were to point out that, in Pirahã, turn-taking is not a relevant organizational feature of conversation, they would doubt it (I have and they do). Why? If we only wish to describe the data then it is perfectly reasonable to accept the following:

1. 99 percent of the people in the world organize their conversation by turn-taking.
2. ½ percent do not organize their conversation by turn-taking.
3. ½ percent talk with their ears.

[Number] 2 is questionable and [Number] 3 is ridiculous, not because of recorded observations or the lack of observations, but because any researcher worth his salt has formed a theory based on his observations and extended that theory to predict the form of future data. "Surprise" results when our theories are contradicted.

3. Conclusions

From either a theoretical, pedagogical, or methodological point of view, we need to remind ourselves that minimal pairs are “icing” on a “cake” of deductive principles. We must avoid the temptation to throw out “nagging” regularities on the basis of a few examples of contrast in identical environment.² Certainly, I am not advocating outlandish hypotheses which need not concern themselves with empirical evidence. Yet, minimal pairs by no means guarantee empirical validity.

References

- Chomsky, N. A. 1964. “Current issues in linguistic theory.” *The structure of language*, edited by Fodor and Katz. Englewood Cliffs: Prentice-Hall.
- Chomsky, N. A., and M. Halle, 1968. *The sound pattern of English*. New York: Harper and Row.
- Everett, D. L. 1979. “Aspectos da fonologia do Pirahã.” Master’s thesis, Universidade Estadual de Campinas.
- Everett, D. L. “Stress and tone in Pirahã.” (Forthcoming.)
- Harris, Z. S. 1951. *Methods in structural linguistics*. Chicago: University of Chicago Press.
- Hyman, L. M. and Schuh, R. G. 1974. “Universals of tone rules: Evidence from West Africa.” *Linguistic Inquiry* 5:81–115.
- Landar, Herbert. 1980. “On stress in Apachean languages.” *International Journal of American Linguistics* 46:228.
- Pankratz, L., and E. V. Pike. 1967. “Phonology and morphotonemics of Ayolta Mixtec.”
- Pike, E. V. 1974a. *Tagmemic phonology*. Mimeo.
- Pike, E. V. 1974b. *Advanced phonology workbook: A hierarchical approach*. Norman: Summer Institute of Linguistics.
- Pike, K. L. 1947. *Phonemics*. Ann Arbor: University of Michigan Press.
- Pike, K. L., and E. V. Pike. 1976. *Grammatical analysis*. Arlington: University of Texas at Arlington; Summer Institute of Linguistics.
- Postal, P. 1968. *Aspects of phonological theory*. New York: Harper and Row.
- Richardson, I. 1971. “Displaced tones in Sukuma.” *Papers in African Linguistics*, edited by C. W. Kim and H. Stalke. Carbondale: Linguistic Research. 219–227.
- Robbins, F. E. 1961. “Quiotepec Chinantec syllable patterning.” *IJAL* 27: 237–250.