You have a Dictionary in your Head, not a Thesaurus

David Fay and Anne Cutler

Two centuries ago, Sheridan invented the delightful character of Mrs. Malaprop, who had an unfailing ability to use the wrong word to the greatest effect. Since Sheridan, the malapropism has been a standard tool of comic writers, especially useful for indicating inferior intellectual ability of a speaker (as when Archie Bunker says "We need a few laughs to break up the monogamy"). But not all errors involving substitution of one word for another result from ignorance of the correct usage; on the contrary, inadvertent use of the wrong word is a common variety of speech error.[1] In this paper we will examine such word substitution errors (which we will call malapropisms, although they do not arise, as Mrs. Malaprop's did, from ignorance); we will show that they reveal some very interesting aspects of the structure of the mental dictionary used in producing and understanding speech.

Consider a typical example of a malapropism:

(1) T: If these two vectors are equivalent, then . . .[2]
E: If these two vectors are equivocal, then . . .

Here the speaker has intended to say equivalent, but has inadvertently substituted for it equivocal. This error illustrates well the three basic defining characteristics of a malapropism. First, the erroneous intrusion is a real word - not the intended word, of course, but not a meaningless string of phonemes either. Second, the target and error seem to be unrelated in meaning. Finally, there is a close relation between the pronunciation of the target and the pronunciation of the error.

Before analyzing in more detail the properties of this kind of error, it would be well to mention some other classes of speech errors that look like malapropisms but in fact are not. The first class comprises errors in which the speech sounds in an utterance are misplaced - spoonerisms, anticipations, perseverations and omissions. Examples (2)-(5) represent typical cases of such errors.

(2)a. T: . . . bone and joint clinic.
E: . . . boin and jont clinic.
b. T: . . . carrot and cabbage.
E: . . . cabbot and carriage.
(3)a. T: . . . splicing from one tape.
E: . . . splacing from one tape.
b. E: If you tend me - if you send me the time of your birth . . .
(4)a. T: . . . pale sky.
E: . . . pale skay.
b. T: People bounce back and forth . . .
E: People pounce back and forth . . .
(5)a. E: When panets - planets pass each other . . .
b. E. A most important vote and repeat - replete with historical overtones . . .

The (a) examples represent cases in which an error of this type has produced a non-word in English, while the (b) cases show that such errors may also result in real English words. In example (2), two phonemes[3] have switched places in the utterance. In (3), a phoneme has been anticipated, and in (4) the speaker has perseverated by repeating a phoneme that occurred earlier in the sentence. In (5), a single phoneme has been omitted from the intended utterance.

A second type of error involving the sound segments of a word arises when two synonyms are blended together. Usually this results in a non-word, but again, a real word of English will occasionally occur; examples are given in(6):

(6)a. T: gripping/grasping
 E: grisping
 b. T: heritage/legacy
 E: heresy

Obviously, when we look for malapropisms, we must be careful to exclude cases of word substitution that might equally well be spoonerisms, anticipations, perseverations, omissions or blends. (A further lesson to be drawn is that in collecting speech errors it is important to note the full linguistic context as well as the speaker's intuition about the intended utterance, in order to be able to perform this categorization correctly.)

A third class of errors that must be distinguished from malapropisms is that of semantic errors. Often these errors consist in saying the antonym of the intended word; (7)-(9) are typical examples:

(7) T: good
 E: bad
(8) T: nearly
 E: barely
(9) T: specific
 E: general

Other kinds of semantic errors involve substitution of body parts or articles of clothing, as in (10) or (11), or changes in a semantic feature (e.g. time and space), as in (12) and (13):

(10) T: Don't burn your fingers.[4]
 E: Don't burn your toes.
(11) T: He got hot under the collar.
 E: He got hot under the belt.
(12) E: The two contemporary - sorry, adjacent buildings
(13) E: Not Thackeray, but someone that wrote below Thackeray - before Thackeray.

This is clearly not an exhaustive classification of semantic errors. Unfortunately, since there is no available theory of meaning, separating semantic errors from true malapropisms is not a task that can be performed mechanically. In compiling the data used in this study we have relied on our intuitions as to what words were semantically related; where we have considered that a semantic relation existed, the error was eliminated from our list. We will show below that there are certain tests one can perform to support our contention that such decisions have not been arbitrary. As far as we can see, then, the malapropisms discussed in this paper involve no meaning relation between target and error.

From a collection of over 800 errors in speech compiled by the first author, we initially selected all errors that involved word substitution. From this initial list we eliminated all errors that could have arisen from the sources discussed above.[5] The remaining corpus comprised 61 errors. These errors, the malapropisms, have some interesting properties. First, the target and the error are of the same grammatical category in 98% of the cases. Second, the target and the error nearly always have the same number of syllables (93% agreement in our list). Third, they almost always have the same stress pattern (98% agreement).[6] Table I summarizes these results:

TABLE I

Agreement on:	Grammatical Category	Number of Syllables	Stress Pattern
Malapropisms	98%	93%	98%
Semantic Errors	--	73%	76%

For comparison, the semantic errors mentioned above can be tested for the same properties. To do this we supplemented the 15 semantic errors eliminated from our original data with 36 found in Fromkin (1973), for a total of 51 errors. The target and error in this case agreed on number of syllables in 73% of the pairs. Of the polysyllabic semantic errors agreeing on number of syllables (17 pairs), 76% agreed on stress pattern. Of course, all of the pairs agreed in grammatical category, because of the nature of the semantic relations involved (antonyms; members of the same semantic field, e.g. body parts, and so on). These results are included in Table I.

Clearly, then, this coincidence of properties between target and error exhibited by malapropisms is not accidental. We will show that it has strong implications for certain aspects of speech production. Before considering these implications further, however, we should devote some attention to the mechanisms by which malapropisms might occur; that is, we should sketch the relevant parts of a theory of speech production.

At a certain point in the production of a sentence a grammatical structure must be framed to carry the meaning which the speaker intends to convey. This structure can be thought of as incorporating both the syntactic properties of the impending utterance (in the form, say, of a phrase structure), and the meanings of the words to be used. What is <u>not</u> in the structure initially is any specification of the phonological characteristics of the chosen words. For these the speech production device must look into its mental dictionary to find a particular entry whose meaning and syntactic category match the specifications embodied in the grammatical structure. If synonyms exist, the device will have to make a choice among the alternatives. Note that the device might err slightly in reading the meaning specification of the word from the grammatical structure. e.g. by switching the value of a particular semantic feature. It is possible that semantic errors such as those in (7)-(13) above might arise in this way. What is important for our purposes, however, is that the device knows two things about a word before it searches for it in the dictionary: On the one hand, its syntactic category (noun, verb, adjective, etc.), and on the other, its meaning.

No commitment is implied in this brief sketch to any particular model of syntactic aspects of speech production. There is evidence (Fay, 1974) that the construction of an utterance may be, in many respects, like the derivation of a sentence in a transformational grammar. Whether or not rules of transformational grammar have direct parallels in psychological operations is not, however, at issue here.

There is at least one respect, though, in which the production model must differ from the grammar. This difference concerns the way in which lexical items are inserted into syntactic structures. Because of its formal representation, the grammar need not represent the "flow of information" in the derivation of a sentence. There is no sense in which lexical items are inserted "before" or "after" the meaning of the sentence is determined by the semantic component. A production model, however, does not have this freedom. The only reasonable assumption to make in such a model is that the meaning of an utterance is constructed before the syntactic structure which will carry the meaning. In addition, the syntax must be constructed on the basis of the meaning. We know little about what the process of construction is like, but it seems obvious that some part of the operation must involve the specification of the meanings of the lexical items to be used. In our sketch of this process we choose to think of the specified lexical meanings as a set of syntactic and semantic features attached as leaves to the phrase structure tree (there are, of course, other ways of representing such information). Given this set of features the speech production device can then look into the mental dictionary to find the appropriate entry matching the features appended to the tree.

What is this mental dictionary, or lexicon, like?[7] We can conceive of it as similar to an everyday dictionary, that is, as consisting of pairings of meanings with sound representations. An everyday dictionary has listed at each entry a pronunciation of the word and its definition in terms of other words. In a similar fashion, the mental lexicon must represent at least some aspects of the meaning of the word, although surely not in the same way as does a printed dictionary; likewise, it must include information about the pronunciation of the word, although, again, probably not in the same form as an ordinary dictionary. What is important to notice about dictionaries is that they must be lists, since the relation between sound and meaning is essentially arbitrary (with the exception of that small subset of words formed by onomatopoeia). Given the meaning of a word, there is no set of rules that one could invoke to construct the pronunciation of the word, and vice versa.

This pairing of sound and meaning must be used in both production and comprehension of speech. In production, as outlined above, the device that searches for a word takes as input a meaning and a grammatical category, and gives as output a sound representation. In comprehension, some representation of the sound of the word is input, and the meaning and syntactic category must be retrieved from the dictionary.

Consideration of the double use to which these meaning-sound pairs are put raises the question of whether there are separate dictionaries for production and comprehension, or simply a single listing which is used in both operations. It might be argued that there should be two listing, since the optimal arrangement of the entries for the purpose of comprehension may not be the optimal arrangement for production. In the latter process, the search for a word must be on the basis of meaning, whereas in comprehension it must proceed on the basis of sound. The relation between meaning and sound being arbitrary, it would seem to be difficult to group together words on the basis of both sound and meaning. Hence if optimal access arrangements are to be made available, separate listing would appear to be necessary.

On the other hand, since the essential property of a dictionary is simply the pairing of sound and meaning, separate listings would entail that each sound-meaning pair be simply duplicated. Any reasonable principle of economy of storage requires that duplication of this sort be avoided, hence that each pairing be listed only once - i.e., in a single dictionary. The evidence from malapropisms argues strongly that there is indeed just one mental dictionary.

For instance, we have noted a coincidence of syntactic category between target and error on the one hand, and a coincidence in phonological properties on the other. While the former might be expected to show up in errors made in the process of accessing a dictionary arranged by the requirements of production, one would not predict in this case any relation between the sound of the error and the sound of the target. That is, if there exist two dictionaries, separately accessed by the production and comprehension devices respectively, there is no way to explain why errors made in the process of word selection should show such a systematic relation in pronunciation to the words sought.

Supposing there to be just one mental lexicon, however, a very simple explanation of this relationship is possible. First, let us consider the principles by which such a single listing might be arranged. It is reasonable to assume that the arrangement should be such as to optimize accessability; however, as has already been pointed out, the optimal arrangements for production and comprehension purposes respectively are different and apparently incompatible. We have also seen already that the phonological similarity between target word and malapropism cannot be explained if we assume the production device accesses a lexicon arranged along semantic lines, and of course this holds whether we posit two listing, or one in which the arrangement happens to be that optimal for a production device. What, though, if there were a single lexicon, arranged on the principle of maximum usefulness for the comprehension device? Then we might expect that near neighbors in the dictionary might be very similar in sound; we might expect that if the production device, homing in on a particular word in the lexicon, were to err just a little and pick, instead of its target word, that word's "next-door neighbor", or a near neighbor, then the word it chose by mistake might sound very similar to the target word, but would be unlikely to bear any relation to it in meaning. We might expect, in other words, to find errors having exactly the characteristics of malapropisms.

We have also noted, however, that malapropisms belong to the same syntactic category as their targets. Does this imply that the mental dictionary is arranged by syntactic category, and only within syntactic category by sound? Possibly this is true; certainly it would make things easier for the production device, which after all "knows" what category it is looking for. On the other hand, it is unlikely that the comprehension device knows the syntactic category of a word it is looking up, so that such an arrangement would be hard to justify from the point of view of comprehension requirements. We know of no strong arguments either way on this point, however, and further discussion of it would simply be speculation.

Let us assume, then, that there is simply one mental dictionary, and that it is arranged according to the sound of the words it lists. The correspondence of syllable structure and stress pattern between target and error in our collection of malapropisms suggests that these two properties may also be principles of arrangement for the dictionary, i.e. that the dictionary may list its entries according to syllable structure and/or stress pattern, and only within these categories according to sound. This would presumably be useful in comprehension; since the comprehension device has segmented the sentence or part of a sentence into words before it begins to look up these words in the lexicon, it is most likely the case that the syllable structure and stress pattern are included among the things it "knows" about each word it is seeking.

One might ask what method of access the production device has to this "comprehension-biased" lexicon. It would certainly be extremely inefficient if the production device were forced to conduct an exhaustive search of the list every time it needed to find a lexical item. Yet the order in which the items are listed is apparently not the order - semantic order - which the production device needs. Is there an alternative to listing, which would allow semantic information alone to be used to locate the exact address of a given lexical item?

Suppose the method of access of the production device to be a system of paths, having a common origin. Each fork in the path would represent a choice between two (or more) values of a particular feature. The more general semantic features would obviously have their forks closer to the origin, the more specific features would occur further down the path system. The production device, given a set of semantic features, would be able to proceed down the path, making a choice at every fork, until there were no more choices to be made, that is, until the path terminated in a particular word. (Since we have assumed the words to be listed by their sound properties, we must assume this system of paths to resemble more a mess of spaghetti than a neatly-arranged "tree".[1] Presumably this would not affect its viability as a thoroughfare, however.)

The above account may appear less than satisfactory, particularly in that the arrangement we have proposed for the production mechanism is not motivated by any empirical considerations. There are, however, certain differences between the tasks of the comprehension and production devices which render this account less arbitrary. Consider the problem of noise. Any system implanted in biological material must overcome the problem of doing its computations in the presence of noise internal to the organism. On this count production and comprehension devices are on a par. However, there is an additional source of noise that the comprehension device must contend with - external noise. It is rare that the comprehension device will be faced with interpreting a signal that is not embedded within a matrix of extraneous noise. The same is not true of the production device. This we take to be a basic difference between the two. Where the comprehension device must retrieve the important information in the speech signal from the irrelevant environmental noise, the production mechanism has only to overcome the internal noise.

In the case of lexical search this difference has an important implication. The comprehension device, but not the production device, must be designed to consider alternative choices in comparing the incoming signal with the lexical entries. That is, the comprehension device will often be faced with deciding which of the lexical entries best matches the (incomplete, distorted and mashed) speech signal. If this is true, then it makes sense to list entries that have similar phonological properties "near" each other, thus facilitating comparison and the choice of the best match. The production device, on the other hand, is presumably never faced with the situation of finding the best match to an incompletely specified input; the device can be as precise as it desires in determining the properties of the entry it is seeking.

It is this fundamental difference between comprehension and production, and the empirical evidence presented here that the lexicon is arranged by sound properties, that have prompted our two proposals: first, that the basic arrangement of the lexicon is by phonological segments for the purpose of aiding comprehension, and second, that the accessing arrangement for production is by means of a network. This latter proposal is, of course, quite inspecific, and the intent is only to provide an example of how the accessing might be accomplished to contrast it with access in comprehension. We will have no more to say about how the lexicon is accessed in production and look forward to the time when a more specific hypothesis can be proposed.

Let us now return to the mental dictionary and the nature of its arrangement. We have said nothing so far about the details of the ordering by sound properties. On this point the correspondences noticed between target words and malapropisms errors are able to shed some light. Consider the process of comprehension; we assume that the speech perception device converts a sound wave representing an utterance into a string of phonemes marked for syllable boundaries, stress pattern, and word boundaries[8]. We know little about how this might take place, but it is commonly assumed that some such conversion must be made. (In fact, this is just the problem of speech perception.) Assume further that the words, so segmented, are looked up in the dictionary on the basis of their phonological "spelling", using a left-to right convention. So, for example, to locate *cat* (/k æ t/), the device goes first to the section reserved for words beginning with /k/, then to the subsection of words beginning /k æ/, and then finally to words beginning /k æ t/. It is here that the device will find an entry for *cat* with the attached information about syntactic category and meaning. Now what can we say about the sound properties of the words that are "near" the entry *cat*? One hypothesis that we might entertain is that the phonological properties are arranged on the basis of distinctive features of the kind proposed by Jakobson and Halle (1952). Thus the nearest entry (of the same length) would be *cad*, since the last phoneme, /d/, differs only on the feature voicing from /t/. Further away would be such entries as *can*, *cab*, *cap*, and so on, which differ from *cat* on more than one feature.

The distinctive feature hypothesis, in conjunction with the left-to-right convention, predicts that at the point at which target and error depart from being identical (counting from the left) the two words would be very close in the feature marking. To test this hypothesis on the malapropism data, we have eliminated those target-error pairs that differ on syntactic category, syllable structure or stress pattern. Our justification for this is that the correspondences noted above for these properties are so high that it would be suspect not to treat them as categorical properties of malapropisms. We might well expect that, as conservative as we have been in eliminating from consideration other known kinds of word substitution errors, we may well have included inappropriately some unrecognized types of errors. Elimination of these errors may provide us with a more truly representative sample. We note in passing that this move in no way increases the chances that our hypothesis will be supported by the data, since the examples we eliminated were excluded independently of whether the data show the sound properties predicted by our hypothesis.

Having excluded possible contaminations, we can perform a feature counting analysis[9] on the remaining 55 malapropisms. To take an example of how this is done, consider the pair *map* - *make*. We first transcribe the target and error into phonological segments: /m æ p/ - /m e k/. Then, counting from the left, we note that it is the second segment at which the transcriptions first differ. Next, we compare the marking of these two segments on distinctive features. They are marked identically on all features but <low>. On this feature, /a / is marked "+" and /e/ is marked "-". Thus we assign one feature difference to this pair. The results of all 55 comparisons are presented in Fig. 1.

It can be seen that the greatest number of cases involves as predicted, only a single feature difference. In general, the greater the number of feature differences, the fewer cases we find. By way of comparison, we have performed a distinctive feature analysis on the 51 semantic errors previously mentioned. The results of this analysis are also shown in Fig. 1, and it can be seen that the maximum value of the curve falls, not at one feature difference, but at four.

To make things a bit clearer, we should note that 44 of the 55 malapropism cases are vowel-vowel or consonant-consonant comparisons. All of the spread beyond 7 differently-marked features involves consonant-vowel comparisons[10]. While, the distribution of marking differences on features is in general what we would predict, we still need some estimate of how similar the phonemes of English are in general. For this estimate, we have compared every vowel with every other vowel and counted the number of features on which they are differently marked. In a similar fashion we have compared all consonants with each other. The results of this analysis are compared with the results of the analysis of the malapropism data in Figs. 2 and 3.

Again we have included the equivalent comparisons for semantic errors. The latter show a distribution similar to the distribution for all consonants and all vowels, a pattern that is however strikingly different from the distribution of feature differences in malapropisms.

It appears, then, that the listing of words in the mental lexicon may be done on the basis of a distinctive feature system. Those words that begin with the same phoneme are listed together, those that have the same second phoneme form a subcategory of that class, and so on. Adjacent categories on the same level are minimally different in terms of their feature markings.

We should note that there is fair amount of spread in the distributions in Figs. 2 and 3, particularly in the case of the consonant-consonant comparisons. We might account for at least some of this spread by noting that there are many lacunae in the dictionary. For example, if we compare equivocal with equivalent we find that there is no other three-syllable word that is more like equivalent than equivocal.[11] Yet if we compare them at the point at which they depart from identity (l/ versus /k/), we find that they differ on seven features. Thus even if two words are listed next to each other in the dictionary we cannot guarantee that they will differ on only one or even a few features. It is remarkable, in fact, that our analysis shows such close correspondence on feature marking.

Let us summarize here the main properties of the mental dictionary as revealed by malapropisms.

(1) There is a single dictionary used for production and comprehension.
(2) The major partitioning of the dictionary is by number of syllables.
(3) Within syllable categories, words are categorized by stress pattern.
(4) Within the above categories, words are arranged on the basis of a distinctive feature system, presumably in a left-to-right manner.

(5) Words may be arranged also by syntactic category.

Our model provides, we think, a reasonable outline for a mental dictionary. It has some rather straight-forward implications for models of language performance. There is, however, one area of this study in which we feel that a major revision, of some importance, may be necessary. In our distinctive feature analysis we used a level of description closely corresponding to that of autonomous phonemics. Although this level is sufficient for our purposes, we might ask whether it is the appropriate level of description for the mental dictionary. Chomsky and Halle have argued persuasively in The Sound Pattern of English(1968) that a deeper level of analysis, that of systematic phonemes, is necessary to explain the underlying regularities of the sound structure of English. Their analysis raises the question of whether the mental lexicon may not likewise be based on systematic phonemes. In fact, there is some evidence from speech errors that such an analysis is appropriate. Fromkin (1974, p. 21) gives examples of segmental misordering such as that in (14):

(14) T: swing and sway
E: swin and swaig

These examples can be explained quite simply if one adopts an analysis in which the sequence, /ng/, underlies the surface segment /ŋ/. Since there are two segments in the underlying form, the /g/ is free to move independently of the /n/, giving rise to such utterances as (14).

If these arguments are correct, we should expect that a re-analysis of our data on this deeper level would provide a simpler description of the sound relations between targets and malapropism errors. Although we have not yet found convincing arguments that this is true, there are certain hints that a deeper analysis would be desirable. We noticed that a number of target error pairs involved the comparison of /y/ with a vowel at the point of departure. We list these examples in (15):

(15)

	Error	Target
a.	muscian[12]	magician
b.	museums	machines
c.	emanate	emulate
d.	review	revise

It is interesting in this regard that Chomsky and Halle propose a rule (1968, p. 192ff.) that inserts a /y/ before certain vowels. If this rule applies in the examples above, we could compare the target and error words at a level before the /y/-insertion rule had applied. This would mean that the comparison at the departure point would be between two vowels rather than between a vowel and a glide. This is surely an intuitively appealing step and it should result in a decrease in the marking differences in the above examples. Whether a reanalysis at the level of systematic phonemes would result in an overall simplication in the description of our data is a complex issue beyond the scope of th present work.

If such re-analysis is warranted, then we might question our results on syllable structure and stress pattern. That is, suppose that syllable structur and word-level stress are imposed on a lexical item after it is inserted into a syntactic structure (presumably, this would be accomplished by readjustment and phonological rules, which will be needed anyway if entries in the lexicon are written in systematic phonemes). If syllable structure and stress are predictable in this way, there is no need to list such information in the lexicon. The fact that target and error words agree in number of syllables and stress would then follow directly from the fact that they have similar underlying segments, and from the nature of the stress rules.

Although in these respects our model is open to further elaboration, we feel that the evidence from malapropisms has supplied new insights about the cognitive apparatus involved in language behavior. In particular, it has provided strong evidence for the existence of but one mental lexicon, and for the organization of the entries in the lexicon according to phonological properties. We hope that this account may prove of value for the construction of more detailed and explicit descriptions of the processes involved in language use.

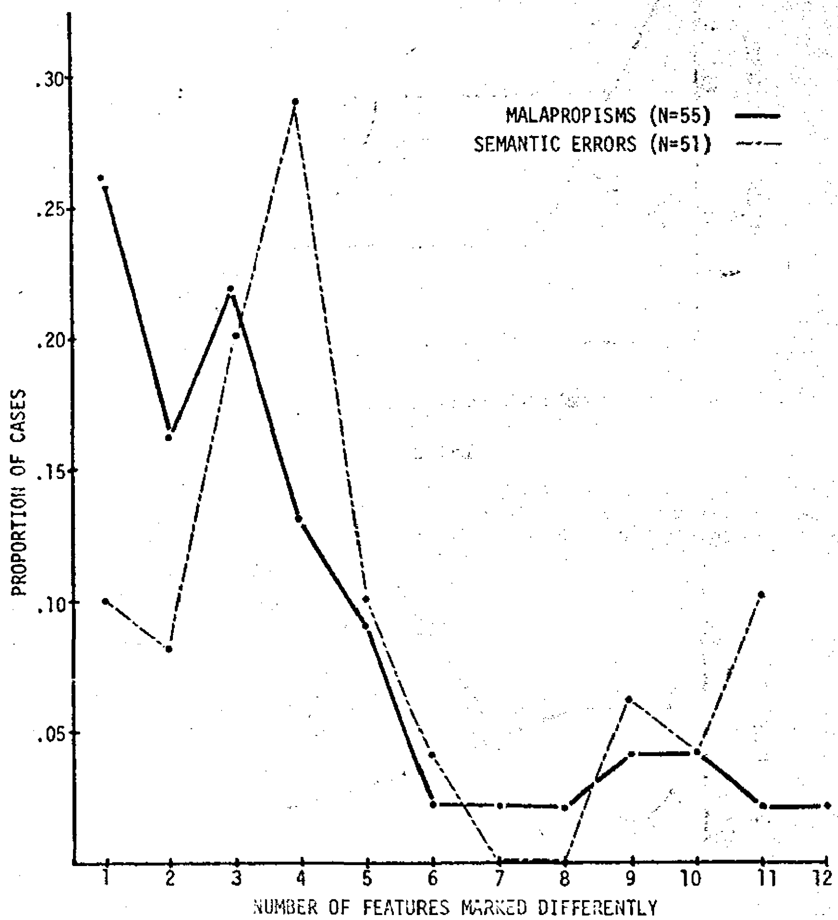
MALAPROPISMS (N=55)
SEMANTIC ERRORS (N=51)
PROPORTION OF CASES
.30
.25
.20
.15
.10
.05
1
2
3
4
5
6
7
8
9
10
11
12
NUMBER OF FEATURES MARKED DIFFERENTLY

FIGURE 1.

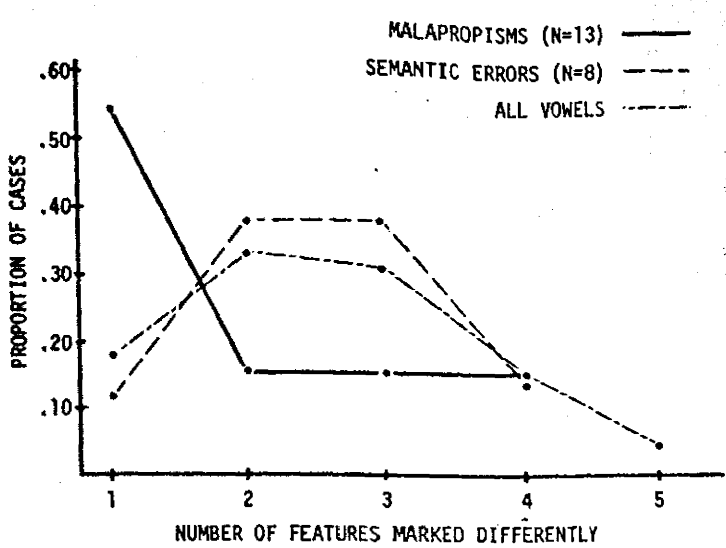

FIGURE 2.

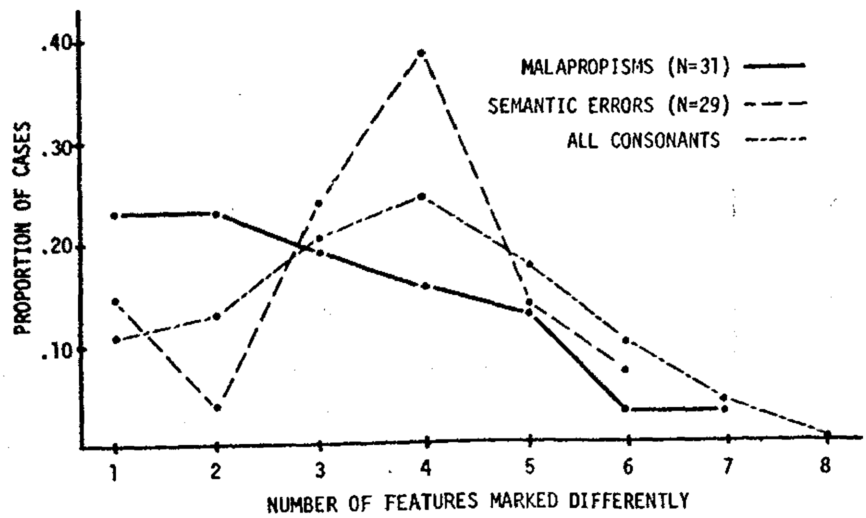

FIGURE 3.

Footnotes

1. This type of error has been noted and discussed by others; principally, by Nooteboom (1969) and Fromkin (1971; 1973, Introduction). It will be apparent that our account of the source and import of such errors differs in many respects from those offered previously.

2. Throughout this paper the term target (T) will be used to refer to the intended utterance, and error (E) to refer to the utterance as spoken. In examples of speech errors, dashes (-) indicate a pause by the speaker, and dots (...) indicate that the remainder of the utterance was not recorded.

3. See Fromkin (1971) for evidence that it is indeed phonemes, rather than phones, that are involved in these errors.

4. Examples (10) and (11) come from Fromkin (1973 Appendix); example (12) is from Nooteboom (1969).

5. Malapropisms involving presupositions (4 in number), adverbs (2), and compound nouns (4) were also eliminated. These kinds of malapropism seem to have slightly different properties from the more frequent errors involving nouns, verbs, and adjectives; the major difference is that they have a much higher incidence of disagreement on number of syllables. We hope to discuss these examples in a future paper.

6. By "same stress pattern", we mean that the main lexical stress falls on equivalent syllables in target and error. Of course this comparison cannot by meaningfully performed with monosyllables or with malapropisms in which the target and error have differing numbers of syllables. After eliminating such pairs we compared the remaining 46 pairs.

7. We will use the terms dictionary and lexicon interchangeably to refer to the listing of words in the head.

8. It may well be true that the device entertains simultaneously a number of hypotheses about where word boundaries fall. The hypothesis that is finally chosen might then be the one in which all the putative words have entries in the lexicon.

9. For a distinctive feature analysis of the phonemes of English we have used that given in Lehmann (1972, p. 98). This particular analysis is a modified version of the Chomsky & Halle (1968) feature chart; it eliminates from consideration phonemes which never appear in phonetic representations.

10. These comparisons result in such large differences because not all the features apply to consonants and vowels respectively. We have adopted the conservative strategy of treating all comparisons in which one segment is marked on a feature, while the other is not, as being differences in feature marking. That is, the difference is treated as if one segment were marked "+" and the other "-" on that feature.

11. This is true only if the listing is partitioned by grammatical category. If it is not, then the verb equivocate is presumably listed closer to equivocal than is equivalent. However, as mentioned earlier, there is no reason to believe that equivocate would not in any case appear as a malapropism for equivocal because of this difference in syntactic category.

12. In the dialect of the speaker of this error, museums has two syllables (musaems). Thus despite initial appearances, this is not an example of disagreement on syllable structure.

References

Chomsky, N. and M. Halle. 1968. The sound pattern of English. New York: Harper and Row.

Fay, D. 1974. Simplificaton in children's speech and the formulation of movement rules. Paper presented at the Summer Meeting of the Linguistic Society of America, Amherst, Mass.

Fromkin, V. 1971. The non-anomalous nature of anomalous utterances. Language 47.27-52. (Also reprinted in Fromkin, 1973.)

Fromkin, V. (ed.) 1973. Speech errors as linguistic evidence. The Hague: Mouton.

Jakobson, R. and M. Halle. 1956. The fundamentals of language. The Hague: Mouton.

Lehmann, W.P. 1972 Descriptive linguistics: an introduction. New York: Random House.

Nooteboom S.G. 1969. The tongue slips into patterns. In Leyden studies in linguistics and phonetics. The Hague: Mouton. (Also reprinted in Fromkin, 1973.)

Department of Psychology
The University of Texas at Austin
Austin, Texas 78712