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IMPERFECT PUNS, MARKEDNESS, AND PHONOLOGICAL SIMILARITY: WITH FRONDS LIKE THESE, WHO NEEDS ANEMONES?*

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1. IMPERFECT PUNS

There are many metrics of similarity between phonological segments. In particular, there are metrics based on linguistic competence, for example, relatability by natural processes (see BJARKMAN 1982 on 'closest' sounds);[1] those based on experimental studies, for example, confusions of segments in noise, as in the classic study by WANG and BILGER (1973); and those based on observations of natural linguistic behavior.

Research in this last category has examined substitutions of segments in slips of the tongue, as in SHATTUCK–HUFNAGEL and KLATT (1980); substitutions in slips of the ear, as in the work summarized in BROWMAN (1980) and GARNES and BOND (1980); replacements of segments in nonsense expressions like *puppy-wuppy*, as studied by CAMPBELL and ANDERSON (1976); and systems of half rhyme in verse, as in ZWICKY (1976). Here we open up the study of a new metric of this sort, based on imperfect puns, examples of which are provided in (1) and (2) (both from CROSBIE 1977).

(1) Sign by gate to nudist colony: "Come in. We Are Never Clothed." [target *closed*, pun *clothed*]

(2) A man wanted to buy his wife some anemones, her favorite flower. Unfortunately, all the florist had left were a few stems of the feathery ferns he used for decoration. The husband presented these rather shamefacedly to his wife. "Never mind, darling", she said, "with fronds like these, who needs anemones?" [target *friends*, pun *fronds*; target *enemies*, pun *anemones*]

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In a perfect pun, a single phonological entity is to be understood as representing two distinct lexical items. In an imperfect pun, one phonological entity (the p u n) stands for a phonologically distinct (but similar) entity (the t a r g e t), the two representing two distinct lexical items as before. Note that we make no reference whatsoever to spelling in these characterizations, though much of the literature on puns in English is taken up with orthographic identities (despite the fact that oral transmission is the norm for punning in the language).

As the basis for our study we assembled a corpus of several thousand puns, from four sources: two published collections (CROSBIE 1977, an assortment of punning jokes; and MONNOT 1981, a survey of puns in advertising), a collection of advertising slogans (SHARP 1984), and a further set put together by the authors and cooperative friends from advertisements and catalogs during the period from mid-1983 through late 1984. Although the original collections include both perfect and imperfect puns, for our purposes in this paper we omit all perfect puns and also those imperfect puns involving stress, word division, languages other than English, speakers indicated as having nonstandard accents, matchings of vowels with consonants, or reversal rather than replacement of segments. Our original intention was to examine several properties of the corpus, in particular to compare puns in advertising with those in jokes and to contrast puns involving formulaic expressions with those without such involvement. Here we report only on the phonological relationships in the imperfect puns.

The resulting reduced corpus was, of course, made up of whole phrases and sentences, from which we extracted individual pun words and matched them with what we judged to be their targets. These we transcribed phonemically, distinguishing only those pairs of segments that are generally distinct in American English; we did not, for instance, transcribe more than one neutral unstressed vowel.[2] Then we compared the transcriptions for target and pun, extracting the slot or slots at which the two differed (and disregarding all identical subparts of the words).

The final result is 2140 instances of segmental phonological relationships, of two types: s e g m e n t / z e r o as in (3); and f e a t u r a l, involving either vowels as in (4), or consonants as in (5) (all three examples again from CROSBIE).

(3) The lobe was the original earring aid. [target *hearing*, pun *earring*]
(4) Engraving gives one the satisfaction of scratching the etch. [target *etch*, pun *itch*]
(5) One day Prince Jacques and his sister, Jill, went for a walk with the court jester. Unfortunately, Jacques fell down and broke his clown — and Jill came tumbling after. [target *clown*, pun *crown*]

Note that a pun word can differ from the target in more than one place. If the target word *defecated* appears as the pun word *deprecated*, then there is both a featural target-pun relationship /f/ → /p/ and also segment/zero relationship Ø → /r/, and the two will be counted and analyzed separately.

In section 2 we consider segment/zero puns, then in section 3 featural puns. In our initial analysis within each section we distinguish the target-pun relationships Ø → /r/ and /r/ → Ø, /t/ → /d/ and /d/ → /t/; then we pool data and consider the nondirectional relationships /r/ ↔ Ø and /t/ ↔ /d/.

2. SEGMENT/ZERO PUNS

The featural puns are the focus of this study, but a prominent characteristic of the full set of imperfect puns — the tendency for marked segments to appear in place of unmarked targets — shows up quite clearly in the segment/zero puns, which we summarize briefly before turning to the featural puns.

The only vowel involved in such relationships with any frequency is /ə/. Ø → /ə/ and /ə/ → Ø are both reasonably frequent, the former occurring 36 times in our sample, the latter 14 times; the imbalance is significantly different from an even distribution. (For this comparison and the ones that follow we compare the observed distribution to an expected even distribution by a chi-square test; in this case the statistic is significant at the .005 level.) The next most frequent vowel is /ɪ/, with Ø → /ɪ/ occurring 8 times, /ɪ/ → Ø 7 times; these numbers are too small for useful comparison.

Ø → C is somewhat more common than C → Ø (354 examples to 294, a difference from an even distribution significant at the .025 level), with gross disparities (significant at the .005 level or better) for the consonants /l/, /k/, and /p/; the counts are given in (6).

(6) $\emptyset \rightarrow /l/$: 54. $/l/ \rightarrow \emptyset$: 23.
$\emptyset \rightarrow /k/$: 27. $/k/ \rightarrow \emptyset$: 9.
$\emptyset \rightarrow /p/$: 12. $/p/ \rightarrow \emptyset$: 4.

When $C \rightarrow \emptyset$ and $\emptyset \rightarrow C$ are pooled, the ranking of consonants for $C \rightarrow \emptyset$ is as follows:[3]

(7) r l h t s d k w n y m p b ǰ v g z-f-θ, š-ŋ-ð, ž-č

The ranking in (7) is not significantly different from the ranking of consonant phonemes by text frequency, as given in Appendix IV (p. 110) of ROBERTS (1965),[4] indicating that segment/zero relationships have no demonstrable bias for individual consonants. Particular segments occur in imperfect puns with about the same frequencies as in speech.

3. FEATURAL PUNS

It is clear from the outset that particular segments do not appear equally often in targets and in puns. In this respect, imperfect puns are sharply distinguished from the single-phoneme substitution slips of the tongue studied by SHATTUCK-HUFNAGEL and KLATT 1980, who considered two models of the tongue-slip process: a 'strong ousts weak' model, in which 'members of the strong set of segments are more likely to appear as intrusions, whereas those from the weaker set will be more likely to appear as targets' (p. 40), versus a model 'based on the confusion of two simultaneously represented and similar planning segments' (p. 40), in which 'each segment will serve as a target and as an intrusion about equally often' (p. 40). SHATTUCK-HUFNAGEL and KLATT argue for the second model, using a chi-square test on the distribution of consonants as targets and as intrusions; the two distributions are not significantly different.

The same test applied to our data shows that for puns the two distributions are significantly different; there is a demonstrable tendency for one set of vowels to oust another, and a demonstrable tendency for one set of consonants to oust another.[5] The distributions for consonants are summarized in the table in (8), for vowels in (9).

(8) *Consonants*

	Target	Pun		Target	Pun
č	11	24	ǰ	18	10
ð	14	4	k	37	68
ŋ	0	5	l	54	47
š	24	38	m	33	24
θ	22	36	n	43	42
ž	1	3	p	42	39
b	33	62	r	45	47
d	52	66	s	82	63
f	43	33	t	104	72
g	35	28	v	22	35
h	27	13	w	38	25
z	31	23	y	7	11

(9) *Vowels*

	Target	Pun		Target	Pun
æ	60	34	ɔ	36	34
ɛ	98	47	e	49	46
I	70	60	i	26	61
oy	3	14	o	25	32
U	4	4	u	17	28
aw	2	8	ə	51	56
ay	15	21	ʌ	47	41
a	44	61			

3.1. *Individual features: consonants.* In the previous section we observed an ousting effect within the full set of consonants and within the full set of vowels. But what about individual segments X and Y? When the number of occurrences of X → Y exceeds the number of occurrences of Y → X, that is, when Y appears as a pun substitute for X more often than the reverse, and when this difference is statistically significant,[6] we shall say that Y o u s t s X.

We now consider some individual features, first for consonants, then for vowels. In every instance where there is a significant difference (except perhaps one considered in the next section) the marked segment ousts the unmarked.

In the case of voicing, summarized in (10), there is a clear tendency for marked (voiced) to oust unmarked (voiceless) in the stops:

/b/ ousts /p/ [4.76], /d/ ousts /t/ [5.07]. None of the other differences is significant.

(10)

č	→	ǰ	0	ǰ	→	č	5
θ	→	ð	1	ð	→	θ	1
š	→	ž	0	ž	→	š	1
p	→	b	13	b	→	p	4
t	→	d	37	d	→	t	20
f	→	v	6	v	→	f	3
k	→	g	14	g	→	k	19
s	→	z	16	z	→	s	23
			87				76

In the case of the position features, marked (peripheral) ousts unmarked (coronal) for one anterior stop — in (11), /b/ ousts /d/ [7.14] — and comes close to ousting for another, /p/ over /t/ [3.77]. The two remaining comparisons involve essentially identical figures (for /m/ versus /n/ and for /s/ versus /f/) or small numbers (/z/ versus /v/).

For the (two-feature) differences in (12), involving alveolar (unmarked coronal) and velar (marked peripheral) stops, /k/ exceeds /t/, but the difference is not significant [2.46]. The remaining comparisons have small numbers.

In (13) the palatal-velar differences involve numbers too small for comparison, but one of the alveolar-dental differences there indicates again that marked ousts unmarked; whether this difference involves coronality or stridency, /θ/ ousts /s/ [10.71].

Most of the alveolar-palatal differences in (14) involve small numbers. The one that does not has marked (posterior) exceeding unmarked (anterior), /š/ over /s/, though the difference is not significant [2.63].

In (15), marked posterior ousts unmarked anterior in the one case with large enough numbers: /k/ ousts /p/ [8.07].

(11)

s	→	f	6	f	→	s	5
z	→	v	0	v	→	z	2
n	→	m	17	m	→	n	17
d	→	b	12	b	→	d	2
t	→	p	10	p	→	t	3
			45				29

(12)

t	→	k	17	k	→	t	9
d	→	g	2	g	→	d	1
n	→	ŋ	5	ŋ	→	n	0
			24				10

(13)

č	→	k	1	k	→	č	3
ǰ	→	g	1	g	→	ǰ	1
s	→	θ	18	θ	→	s	3
ž	→	ð	1	ð	→	ž	0
			21				7

(14)

s	→	š	24	š	→	s	14
z	→	ž	3	ž	→	z	0
t	→	č	4	č	→	t	1
d	→	ǰ	1	ǰ	→	d	0
			32				15

(15)

p	→	k	11	k	→	p	2
b	→	g	4	g	→	b	4
m	→	ŋ	0	ŋ	→	m	0
			15				6

Finally, in the case of manner features (summarized in (16) and (17)), most of the numbers are too small, are nearly equal (for /r/ versus /l/ and for /r/ versus /w/), or do not differ significantly (for /t/ over /s/ and for /f/ over /p/). In the one remaining case, the labial stop /v/ ousts the labial approximant /w/ [7.14], which is what we would expect if consonantal and obstruent segments are marked with respect to nonconsonantal and sonorant segments, respectively.

(16)

s	→	t	4	t	→	s	9
f	→	p	10	p	→	f	4
z	→	d	0	d	→	z	0
v	→	b	6	b	→	v	3
			20				16

(17)

r	→	l	18	l	→	r	20
w	→	v	12	v	→	w	2
r	→	w	10	w	→	r	11
			40				33

3.2. *Individual features: vowels.* Here there are not many common substitutions. Some height relationships are summarized in (18), some tenseness relationships in (19). In the first table, /ɪ/ ousts /ɛ/ [4.9], and no other differences are significant. This particular ousting is problematic if mid vowels are considered marked as opposed to high; it is not problematic if these markedness values are reversed for lax vowels, as we believe they should be (following Donegan (1978, ch. 3)).

The second table exemplifies a tendency for (marked) tense vowels to oust (unmarked) lax ones. Of the four comparisons, two are significant: /i/ ousts /I/ [10.70], and /o/ ousts /ɔ/ [5.33].

(18)

i	→	e	11	e	→	i	15
ɪ	→	ɛ	13	ɛ	→	ɪ	27
ɛ	→	æ	16	æ	→	ɛ	13

(19)

i	→	ɪ	5	ɪ	→	i	22
o	→	ɔ	2	ɔ	→	o	10
u	→	ʊ	2	ʊ	→	u	2
e	→	ɛ	7	ɛ	→	e	11

3.3. *Importance of particular features.* When [+X] → [−X] and [−X] → [+X] are pooled, we can detect the relative importance of certain phonological features.

For consonants, voicing is clearly the most important; there are 163 examples, summarized in (10) above, involving this one feature. Position features are the next most important; coronality and anteriority between them account for 197 examples, summarized in (11)—(15) above. Voicing and position together account for 360 of the 818 examples of featural puns involving consonants.

For vowels, height and tenseness are obviously the most important, as we have just seen. In each case, only two or three dimensions account for a substantial part of the imperfect pun relationships.

3.4. *Phonological relationships.* We have not attempted to extract an empirical set of features from our data, using multidimensional scaling techniques in the fashion of the perceptual research summarized in Singh (1976). The raw numbers are rather small for this purpose, but it might be attempted with a larger corpus.

When we examined segment relationships using an *a priori*, but conservative, set of distinctive features, we did find that about half of our examples involved a single-feature difference (434 of the 818 consonant examples, 264 of the 547 vowel examples). We view this result as striking, especially in light of the fact that when a familiar saying or phrase is punned on, it is possible for the punster to get away with very considerable divergences from the target, as in (20), from Crosbie, where the target and pun differ in stress placement, initial consonant, and first vowel.

(20) There once was a tolerant cow who stood for absolutely anything her favorite bull tried to get away with. She reasoned, 'To err is human, to forgive, bovine'. [target *divine*, pun *bovine*]

We conclude that imperfect puns indicate that certain phonological segments are indeed very similar: in particular, consonants differing in voicing or position; vowels differing in height or tenseness; /l/ and /r/; /n/ and /m/. These results are roughly comparable to other measures of phonological similarity, though they are not identical in detail to them, as we now illustrate.

Consider first the strong relationship between /m/ and /n/; this recurs in production studies, for instance those examining speech errors, and also in studies of perceptual similarity other than those using imperfect puns, as in research on half rhymes and on perceptual confusions. However, in a second example there is a strong relationship between /r/ and /l/ in the speech error data (production) and in our imperfect pun corpus, as well as in some other perceptual-similarity studies (involving confusions, either in experimental settings or, in the case of slips of the ear, in natural settings) — but not in the half rhyme data. A similar array of facts obtains in a third example: The speech error data show /s/ and /š/ to be very close, a finding replicated to some degree in our study of puns and in the confusion literature — but, not at all in the half rhyme corpus. In contrast, our fourth example has the half rhyme data (and confusion studies) showing /n/ and /ŋ/ to be very close, a finding supported neither by our puns study nor by speech error tabulations.

To some extent differences between half rhymes and the other data can be taken as reflecting the difference between studies restricted to the rhyme parts of words and those examining segments anywhere within words. Other divergences might be argued to follow from differences between perception and production. But much remains unexplained; by reporting on our research on imperfect puns we hope to provoke further studies of these questions.

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NOTES

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[1] This way of looking at the matter reverses the usual view, in which phonetic similarity is taken as a criterion for natural processes (see DRESSLER 1985, secs. 5.3, 5.18.3).

[2] Certain peculiarities in the resulting data may be traced to the fact that almost all of the puns were collected from writing. For instance, almost all puns involving [a] and [ɔ] had to be removed from the corpus because it was impossible to tell if they had been intended as imperfect or perfect puns; this particular distinction is neutralized for many American speakers.

[3] Segments linked by hyphens are tied with one another.

[4] Spearman's coefficient of correlation between the two rankings is .799, significant at better than the .002 level.

[5] The chi-square statistic for consonants (with 23 degrees of freedom) is 69.97, for vowels (with 14 degrees of freedom) 58.79. Both figures are significant at better than the .005 level.

[6] We compared the observed distribution of X → Y and Y → X to an 'expected' even distribution of substitutions. For significance at the .05 level, the chi-square statistic (with one degree of freedom) must be at least 3.84; in the text we cite the chi-square figures inside square brackets. Note that differences can fail to be significant because the raw numbers are too small; if the total number of X → Y and Y → X puns is 10 or less, the test is inapplicable.

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