

Well, this rock and roll has got to stop.
Junior's head is hard as a rock.*

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1. Imperfect rhyme. Though perfect rhyme is the standard in the familiar verse of English, popular verse (and some modern poetry) often uses imperfect rhyme.¹ In perfect rhyme, the stressed vowels of corresponding words are identical, and so are the following consonants and any following unstressed syllables: sty rhymes with pie, stick with pick, sticky with picky, stickiness with pickiness. According to traditional classification, imperfect rhyme deviates in one (or more) of four ways:

- a. One (or both) of the matched vowels is unstressed, as when kiss and tenderness rhyme (Springsteen, 'She's the One'), or scenery and tapestry (Simon, 'A Hazy Shade of Winter'). This is light, or tangential, rhyme, used very successfully by Marianne Moore.
- b. The stressed syllables match, but following unstressed syllables do not. Usually, one word has an additional syllable lacking in the other, as when face and places are rhymed (Harrison and Starkey, 'Photograph'), or end and offended (Harrison, 'Run of the Mill'). This is apocopated rhyme, much used by Archibald MacLeish.
- c. The stressed vowels do not match, though the following consonants do, as when off is rhymed with enough (Dylan, 'It's Alright Ma (I'm Only Bleeding)') or stop with up (Dylan, 'I Shall Be Free'). This is consonance, found most notably in the poems of Emily Dickinson.
- d. The stressed vowels match, but the following consonants do not, as when wine rhymes with times (Taupin, 'Elderberry Wine') or sleepin' with dreamin' (Dylan, 'Mr. Tambourine Man'). This is assonance, prominent in the work of Gerard Manley Hopkins, Wilfred Owen, and Dylan Thomas, among others.

All four of these relaxations of the conditions on rhyming occur in traditional English ballads, nursery rhymes, blues lyrics, and in the major current source of popular verse, the lyrics of rock music. However, they are not equally common, assonance being by far the most frequent poetic device of the four. In examining many thousands of lines of rock lyrics,² I came across fewer than a dozen examples each of light rhyme and apocopated rhyme, and about a hundred examples of consonance. Of assonance, however, there were about six hundred instances.

2. Assonance and rock rhyme. It would be misleading to say that rock lyrics employ a great deal of assonance and a fair amount of consonance, and leave it at that. For, as Maher 1969 points out in a note on imperfect rhyming in English doggerel and Mother Goose rhymes, the consonants that are paired in assonance in popular versification usually differ in a single distinctive feature (thus supporting claims of psychological reality for distinctive features); Maher gives

five examples in which m rhymes with n, two in which p rhymes with k, and one each of b-d, d-g, and š-č. In other words, at least some sorts of popular verse do not give up the conditions on the identity of vowels and consonants, thereby showing consonance and assonance in all their variety, but rather in this verse the conditions are relaxed, giving a rhyming scheme which is looser than perfect rhyme but still complex and interesting--and which also might supply us with some insights into the 'phonological space' of a language.

A brief survey of the examples of assonance in three dictionaries of poetic terms (Deutsch 1962; Thrall, Hibbard, and Holman 1960; and Untermeyer 1969) supports the view that in popular verse the condition demanding identical consonants is not abandoned but merely relaxed to permit single feature differences. Of 13 examples indicated as from popular sources,³ 11 involve differences that are plausibly one-feature (three cases of m-n, two each of p-t and t-k, and one each of b-d, n-ŋ, n-d, and t-d). One example, man-hand, shows a consonant cluster paired with its initial consonant (nd with n). The remaining case, death-left, has θ rhyming with f, plus a consonant cluster paired with a single consonant; it is reasonable to see θ-ft as a compound of the single-feature principle and the principle illustrated by man-hand. These examples can easily be multiplied from other sources of popular verse; see the collections of American folk songs in Lomax and Lomax 1975 and the blues lyrics in Sackheim 1969.

My data on rock lyrics indicate that these illustrations are quite typical--that, in fact, the traditional classification into assonance and consonance is not particularly useful in the analysis of popular verse, which instead can be referred to two major principles:

- a. Feature rhyme: segments differing minimally in phonological features count as rhyming. The segments may be vowels (as in end-wind) or consonants (as in stop-rock); the feature in question can even be syllabicity (as in mine-tryin').
- b. Subsequence rhyme: X counts as rhyming with XC, where C is a consonant (X may end with a consonant itself, as in pass-fast, or with a vowel, as in go-load). In a relatively infrequent variant on this principle, internal subsequence rhyme, X counts as rhyming with CX (as in proud-ground and plays-waves).

The two types of rhyme can be compounded to give examples like queen-king (two feature rhymes, i-I and n-ŋ), high-lives (two subsequence rhymes, X-Xv and X-Xz), dark-hearts (one feature rhyme, k-t, and one subsequence rhyme, X-Xs), age-plains (one feature rhyme, ʃ-z and one internal subsequence rhyme, X-nX), and even friend-rims (three feature rhymes: e-I, n-m, d-z).

Compounding is not the only way in which the principles of feature rhyme and subsequence rhyme can be extended to allow the pairing of words that are phonologically fairly distant from one another. Imperfect rhymes can also be linked in a chain: X is rhymed (imperfectly) with Y, and Y with Z, so that X and Z may count as rhymes thanks to the mediation of Y, even when X and Z satisfy neither the feature nor the subsequence principle. For example, in 'Mr.

Tambourine Man' Dylan is able to rhyme fate with waves (t-vz) by linking them with today, which is a subsequence rhyme to them both:

With all memory and fate
 driven deep beneath the waves
 Let me forget about today
 until tomorrow.

And in 'Blackbird' Lennon and McCartney manage to rhyme night, life, and arise (t-f-z) by linking them with fly, again using subsequence rhyme:

Blackbird singing in the dead of night
 Take these broken wings and learn to fly
 All your life
 You were only waiting for this moment to arise.

In some cases, words rhymed by linking could equally result from compounding, as when Dylan in 'Oxford Town' matches son and bomb (ʌn-am), through the mediation of two words in ʌm, come and from:

Me and my gal, my gal, son,
 We got met with a tear gas bomb,
 I don't even know why we come,
 Goin' back where we come from

or when he matches hatred with make it (trɪd-kɪt) by means of the remarkable series of linkings hatred-sacred (t-k), sacred-naked (Xr-X), naked-make it (d-t); these are, in order, the conclusions of the four subsections of the second stanza of 'It's Alright Ma (I'm Only Bleeding)'.

The subtle device of linking is not very common. My data contain only 14 occurrences, and in half of these the linked words would already match by feature or subsequence rhyme, so that the mediating word reinforces, rather than establishes, a relationship, as when Bernie Taupin in 'Teacher I Need You' rhymes lean with dream (n-m) by linking them both with me, or when Lennon and McCartney in 'Nowhere Man' rhyme land with plans (d-z) by linking with man.

In contrast to linking, compounding is reasonably frequent. My data include 72 occurrences.⁴

There seems to be no term for a rhyming scheme in which the organizing principles are feature rhyme and subsequence rhyme, extended by compounding and linking. In the face of a great confusion of terminology (see footnote 1), I suggest the (otherwise unused) name rock rhyme.

It may not be obvious that there is in fact any difference between rock rhyme, as just defined, and assonance. After all, the principles of rock rhyme permit great latitude, especially through compounding and linking. However, English rock rhyme diverges in at least two ways from assonance as used by modern English poets: in the segments that count as rhyming, and in the frequency of various sorts of imperfect rhyme. The differences can be illustrated by looking at nearly any poem based on assonance--for instance, Dylan Thomas'

'Fern Hill' (Thomas 1957:178-80). This is a 54-line poem, of six stanzas having nine lines each, with a very clear pattern of assonance (abcdabced, with the second ab reversed in the last stanza). In these 54 lines there are eight examples of rhymes more distant than would be allowed by the principles of feature and subsequence rhyme, even compounded: green-leaves, climb-eyes-light, barns-calves, home-cold, grass-dark, all-warm, over-golden, sleep-fields. Moreover, these eight occurrences in 54 lines are to be compared with the three or four dozen I found in many thousands of lines of rock lyrics; clearly, distant rhymes are vastly more common in the Thomas poem than in rock lyrics. In addition, certain types of rhyming that are rare in rock lyrics are frequent in the Thomas poem: there are five instances of internal subsequence rhyme in the 54 lines of 'Fern Hill', and only 22 in all of the rock lyrics; and there are two or three cases of apocopated rhyme in this single poem by Thomas, as compared to fewer than a dozen in all of the rock lyrics. It seems clear that analyzing Thomas' poetry according to the principles of rock rhyme is not fruitful; Thomas simply permits any identical vowels to rhyme, regardless of what follows them. The scheme of rock lyrics is tighter than this.

3. The rock data. I turn now to a detailed analysis of the data from rock lyrics, within the framework already sketched out.

First, some remarks on the examples themselves. These are largely taken from lyrics by Bob Dylan and by one or more of the Beatles, although quite a few other writers are represented as well (see footnote 2). I have concentrated on Dylan and the Beatles for several reasons: they are among the rock musicians for whom the words are important; their lyrics (and their music) are good; their style is relatively consistent; they are prolific writers, so that there is a rich source of data; and their rhyming schemes are often less restrictive than perfect rhymes but not as free as assonance.⁵

There are three problems of interpretation with the data:

- a. Which words match--that is, which are supposed to count as rhyming?
- b. What pronunciations are the matching words supposed to have?
- c. Is the lyricist using perfect rhyme, or rock rhyme, or assonance, or some other scheme?

The examples were gathered with considerable liberality as to the first question: I included examples even when the rhyming pattern was uncertain; it is, of course, quite likely that some genuine examples were missed anyway.

As for actual pronunciations, I have tried to rely on the readings given by the original lyricists. However, the lyricist is often not the recorded performer, and even if he is his performances may vary, so that there is some latitude for interpretation here. And of course words that are rhymes in one variety of English can be performed in another one, in which they don't rhyme. Finally, it can be fiercely difficult to decide just what pronunciation is being used in a recorded performance, even after many listenings; rock music is not recorded for the benefit of phoneticians.

The rhyming schemes used by lyricists vary a good bit, and it is not always clear whether an imperfection is an occasional divergence or part of a larger pattern: many rock lyrics stick to perfect rhymes; and some have long conversational lines that do not require systematic phonological matching, though they may use assonance and alliteration in a suggestive but irregular way. In this matter I have simply had to use my judgment.

In the counting of examples, I have treated as one example several words of the same form matched with one or more words of different form, so that the following lines from Dylan's 'Highway 61 Revisited' count as a single X-Xd example, not three:

Now the rovin' gambler he was very bored
 He was tryin' to create a new world war
 He found a promoter who nearly fell off the floor
 He said I never engaged in this kind of thing before

However, all compound examples are broken down, so that dark-hearts counts as two examples (k-t and X-Xs), not one. Counting in this way, I have (by pure fortune) exactly 700 examples of imperfect rhyme in rock lyrics. The statistics based on this count cannot be taken as enormously precise, since there are so many stages at which interpretation was needed. Nevertheless, relative rankings and orders of magnitude can shed some light on the English phonological system.

In the following sections, I discuss the various subtypes of rock rhyme, beginning with the most frequent, subsequence rhyme.

4. Subsequence rhyme. Of the 700 examples of imperfect rhyme in the data, not quite half (342, or 48.9%) are of subsequence rhyme, X rhyming with XC; a further 22 are of internal subsequence rhyme, X rhyming with CX (considered separately in section 5 below). The 342 examples of ordinary subsequence rhyme break down into three large groups:

- a. X-XC, where C is an alveolar obstruent: 280 examples (81.9%):
 - i. X-Xd: 121 cases (35.4%)
 - ii. X-Xz: 100 cases (29.2%)
 - iii. X-Xt: 31 cases (9.1%)
 - iv. X-Xs: 28 cases (8.2%)
- b. X-XC, where C is a sonorant; 43 examples (12.6%)
 - i. X-Xn: 13 cases (3.8%)
 - ii. X-Xl: 12 cases (3.5%)
 - iii. X-Xr: 9 cases (2.6%)
 - iv. X-Xm: 8 cases (2.3%)
 - v. X-Xŋ: 1 case (0.3%)
- c. X-XC, where C is some other consonant: 19 examples (5.6%), with C=f, v, č, ĵ, g, p, k. Of these, the only sizable figure is for v (8 examples, or 2.3%), while all the rest have from 1 to 3 examples.

4.1. Subsequence rhyme and frequency. It might be suggested that the segments appearing most frequently in subsequence rhymes are simply those that appear most frequently, period--that the ordering d z t s n l r m v etc. directly reflects the relative frequency of

these consonants in syllable-final position in English.

Fortunately, Roberts 1965 has compiled usable data for comparison. His Table XXI (425-7) supplies relative frequencies for word-final consonants and consonant clusters. If the relative frequencies for a consonant C and all clusters ending in C are added together, we get an estimate of the relative frequency of C in word-final position, a figure that should not be significantly different from the figure we want, the relative frequency of C in syllable-final position. Excluding y, w, and h (which occur word-finally only as the second element of vocalic nuclei), the word-final consonants in Roberts' study fall into five groups:

- a. t n r (relative frequencies of 12-14%);
- b. z d l v s (relative frequencies of 4-8%);
- c. m ŋ (relative frequencies of 3-4%);
- d. k f ĉ (relative frequencies of 1-2%);
- e. p θ ð ĵ š g b ʒ (relative frequencies under 1%)

(the phonemes are listed throughout in descending order). There is, in these data, a rough correspondence to the subsequence rhyme figures: the alveolar obstruents, the sonorants, and the fricative v all rank high in word-final frequency, as they do in subsequence rhymes. However, the alveolar obstruents--in particular, d and z--are not nearly as frequent word-finally as they are in the rhymes; the correspondence in detail is not very good.

4.2. Subsequence rhyme and phonological processes. In interpreting the subsequence rhyme data, it would be natural to suppose that they largely reflect stylistic and dialectal variation in English, that (for instance) the alveolar obstruents so easily rhyme with zero because the alveolar obstruents are so easily deleted in casual speech and in various dialects. On this hypothesis, the very frequent n-nd rhymes (more than half of the X-Xd sample) reflect the ease with which d can be deleted after n by a casual speech process; man and sand get to rhyme in the following lines from Dylan's 'Just Allow Me One More Chance' because of the potential for sand to be reduced to san', according to this hypothesis:

Well lookin' for a woman
 an' a well oh man
 is just lookin' for a needle
 that is lost in the sand

In a few cases, one of the rhyming words is already reduced, as in these lines from 'Oxford Town' by Dylan:

Oxford town around the bend
 ...
 What do you think about that, my frien'?

A potential-for-deletion hypothesis is supported by the finer analysis of some of the data. For instance, when we break down the X-Xd and X-Xt types into those that involve the past or past participle morpheme and those that do not, we see a pattern much like

that observed in studies of t/d deletion in casual speech and non-standard dialects. The figures for rock rhymes:

	<u>X-Xd (121 examples)</u>	<u>X-Xt (31 examples)</u>
past/past participle	22 (18.2%)	5 (16.1%)
other	99 (81.8%)	26 (83.9%)

The ratio of the 'other' cases to the past/past participle cases is 4.5 for the X-Xd rhymes and 5.2 for the X-Xt cases. These ratios compare well with the data on t/d deletion (from various studies) summarized by Labov 1972:222; in these studies, the ratios of percent of simplification in single morphemes to percent of simplification in past tense clusters (for informants of various social classes, of several ages, in New York and Detroit, before consonants and before vowels) range from a low of 1.2 to a high of 7.0, with an average of 2.7 for 22 different comparisons.

However, there is considerable evidence against a potential-for-deletion analysis of subsequent rhymes. Although the most common type of X-Xd rhyme is n-nd, the second most common involves d following a vowel, a position in which d does not easily delete; note the following passage from Dylan's 'Talkin' World War III Blues':

I stood a wondering which way to go,
I lit a cigarette on a parking meter
And walked on down the road

Further, consider the break-down of the X-Xz and X-Xs rhyming types into those that involve the plural morpheme, those that involve the present tense morpheme, those that involve a contraction of the auxiliary verbs is and has, and the remainder:

	<u>X-Xz (100 examples)</u>	<u>X-Xs (28 examples)</u>
plural	75 (75.0%)	18 (64.3%)
present	11 (11.0%)	5 (17.9%)
auxiliary	0 (0.0%)	1 (0.4%)
other	14 (14.0%)	4 (14.3%)

Here the facts for rock rhyme are quite different from those for casual speech and nonstandard dialects. In Black English, for instance, 'There are some speakers who show no [present] -s at all even in careful speech...[but] the plural is almost completely intact' (Labov 1972:221), while in rock rhymes the present morpheme only occasionally matches zero and the plural very frequently does.⁶ That is, for s/z, nonstandard dialects and rock rhyme show divergent patterns. It is important to bear this in mind, since the prime antecedent of modern rock lyrics is black music.

Although rock rhyme does not directly correspond to stylistic or dialectal variation, there is a relationship between the items that can match according to the conventions of rock rhyme and the casual pronunciations of the nonstandard dialects favored by rock

musicians: by and large, the nonidentical elements (\emptyset and d, m and n, etc.) that are equivalents in rhyming are identical in some variety of English. This is so for both subsequence rhymes and feature rhymes. It is so regardless of what pronunciation is actually used in performance. In large part, rock rhyme involves a conventionalized matching of nonidentical elements--using conventions based on, but not the same as, the relationships of segments in certain varieties of English. These conventions permit d to match with \emptyset in an X-Xd rhyme, for instance, even if the d is pronounced in performance and even if the d is in a position that does not favor deletion.

5. Internal subsequence rhyme. Of the 700 examples, only 22 (3.1%) are of internal subsequence rhyme. These fall into two groups:

- a. X-nX (8 examples), X-vX (6 examples), X-lX (4 examples);
- b. X-ŋX, X-pX, X-tX, X-kX (1 example each)

Although there are not enough examples to base any serious generalizations on here, the obvious general statement is that the consonants that participate most freely in internal subsequence rhyme are those that are most easily deleted in casual speech and in nonstandard dialects (especially in preconsonantal position). The X-nX rhymes, in particular, almost surely involve the matching of oral with nasalized vowels, rather than the matching of \emptyset with n; typical examples come from Dylan's 'Gypsy Lou':

She left one too many a boy behind
He committed suicide

and from Lennon and McCartney's 'Sgt. Pepper's Lonely Hearts Club Band':

You're such a lovely audience
We'd like to take you home with us

6. Feature rhyme: consonants. Of the 700 examples, 236 (33.7%) are of feature rhyme for consonants. Together, the principal type of subsequence rhyme and consonantal feature rhyme account for 82.6% of the examples in my data; these are obviously the main springs of rock rhyme.

Chart I summarizes most of the important pairings, along with the number of examples in the sample of 700. In the chart, the number of examples for a particular rhyme pair is given on a line connecting the two consonants. Phonologically close consonants not connected by rhyme in my sample have a dotted line between them. The chart includes a few pairs that are certainly two features away from one another--for instance, d-v and t-f. A few additional pairings are shown in chart II, and chart III gives the pairings for the feature of voicing. The three charts cover all except 12 of the examples.⁹

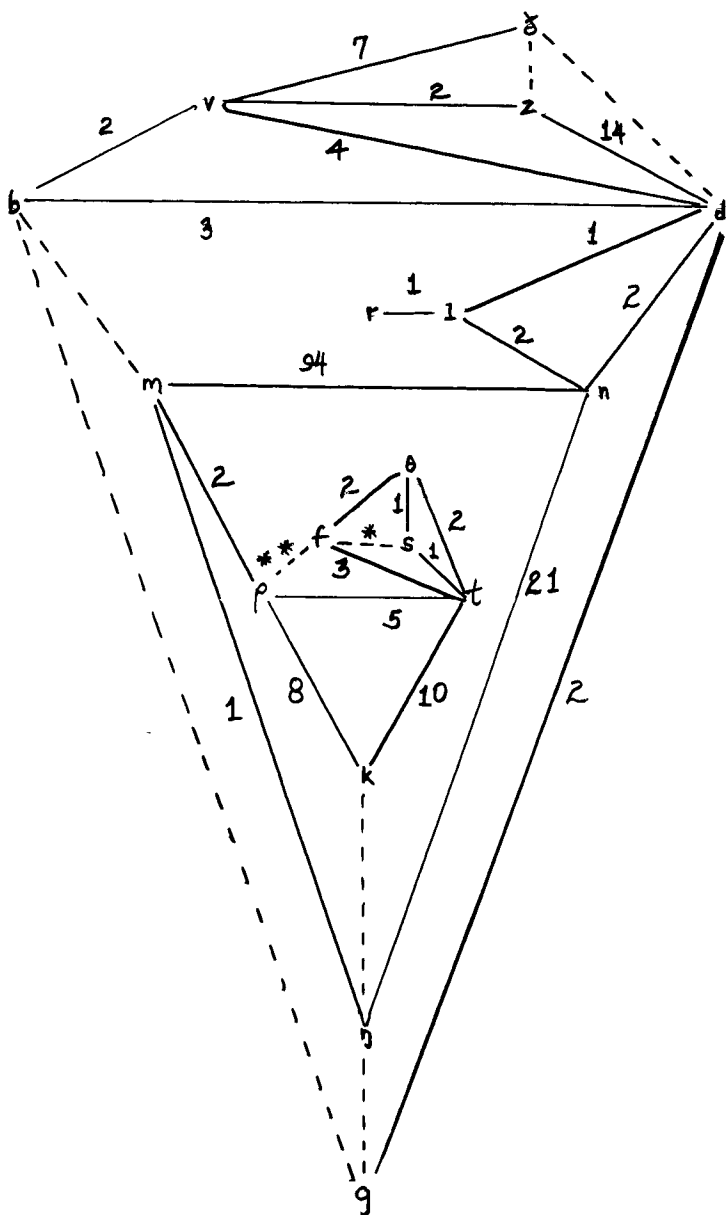


Chart I

*See footnote 7.

**See footnote 8.

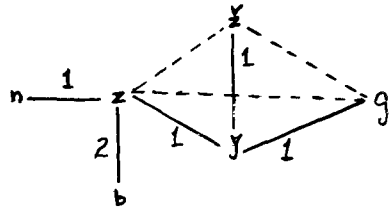
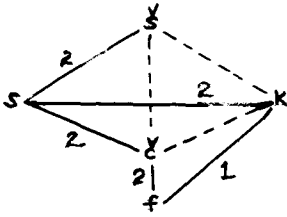


Chart II

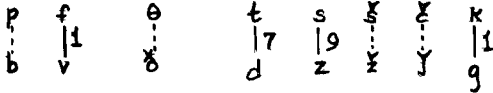


Chart III

The two most important feature rhymes are obviously the pairs m-n (94 examples, or 39.8% of the consonantal feature rhymes) and n-ŋ (21 examples, or 8.9%). Other pairs with three or more examples, in descending order:

d-z:	14 examples
t-k:	10
s-z:	9
p-k:	8
v-ð	7
t-d	
p-t:	5
d-v:	4
b-d	3
t-f	

Typical examples of consonantal feature rhymes (three involving position, two voicing, and one continuancy):

- a. (position) The things that sit and wait for you
 To stumble in the dark
 Will take the cobwebs from your eyes
 And plant them in your heart.
 (Byrd, 'The Elephant at the Door')
 We forsake you!
 Gonna rape you!
 (Townshend, 'We're Not Going to Take It')
 Like dust in the wind you're gone forever
 You're wind-blown leaves you're a change in the weather
 (James Taylor, 'Something's Wrong')
- b. (voicing) Going where the orange sun has never died,
 And your swirling, marble eyes shine laughing,
 Burning blue the light
 (Lamm, 'Fancy Colours')

Oh, yes, I am wise
 but it's wisdom born of pain,
 Yes, I paid the price
 but look how much I gained.

(Reddy, 'I Am Woman')

- c. (continuancy) Tying faith between our teeth
 Sleeping in that old abandoned beach house
 Getting wasted in the heat
 (Springsteen, 'Backstreets')

6.1. Features and rhymes. A glance at the charts and the ranked list of rhymes is enough to show that, on the whole, consonants that rhyme in rock lyrics are one feature apart (in any plausible set of distinctive features). There is a question about position features, since velars sometimes match labials and sometimes dentals, but on the whole the feature differences are unarguably minimal.

However, it is obvious that even if similarity in features is a necessary condition for rhyming it is scarcely a sufficient condition, since many pairs of consonants that are only one feature apart in any plausible feature system do not appear in my data at all, or are evidenced only once or twice. It is also true that some pairs that are obviously more than one feature apart rhyme with at least moderate frequency. I will refer to these failures of one-one correspondence between feature distance and occurrence in rhymes as the gap problem and the long-distance problem, respectively, and discuss them in order.

The gap problem can be illustrated with some of the most frequent rhymes. Notice that p-t, t-k, and p-k rhymes are all fairly frequent, and that there is not much difference in their frequencies of occurrence (considering the size of the sample). Now compare their nasal counterparts, m-n, n-ŋ, and m-ŋ. The first two pairs are quite common, in fact the most common, feature rhymes, but the third occurs only once in my sample. That is, peripheral (grave, noncoronal) consonants rhyme if they are voiceless stops, but not if they are nasals. Similarly, only two voiceless-voiced pairs, t-d and s-z, rhyme with any frequency; see chart III.

The long-distance problem can be illustrated with the pairs d-v and b-z. These are (at least) two features apart in every feature system that linguists have devised, but they are occasionally treated as rhyming in rock music--and these particular imperfect rhymes sound pretty good to me:

The highways jammed with broken heroes
 On a last chance power drive
 Everybody's out on the run tonight
 But there's no place left to hide
 (Springsteen, 'Born to Run')

Have you seen my baby, on the avenue,
 You know she's driving me crazy, with the funny things she do
 (Newman, 'Hold On')

6.2. Feature rhyme and frequency. To interpret the statistics on feature rhymes we must make some correction for the frequency of the

individual segments; clearly, one factor contributing to the great frequency of m-n rhymes is the fact that n is an extremely common consonant in English and m is moderately common too. Just as clearly, frequency is not the only factor involved, for if it were, m-ŋ rhymes would have a frequency comparable to m-n and n-ŋ rhymes. I have not tried to re-scale the figures to take account of frequency differences. Nevertheless, it is plain that the relatively high frequency of rhymes involving alveolar consonants is in part due to the high frequency of alveolar consonants in postvocalic position, and that the very low frequency of rhymes involving θ, ð, and z is in part due to their low frequency in postvocalic position.

6.3. Feature rhyme and phonological processes. In my discussion of subsequence rhyme above, I considered--and dismissed--the idea that this sort of rhyme was actually a kind of potential for deletion, that for the occurrence of C in rhymes of the form X-XC could be predicted from the operation of processes deleting C. I now consider a parallel idea for feature rhyme: that a rhyme between two consonants is actually a sort of potential for alteration of one consonant into the other, that the occurrence of C₁-C₂ rhymes can be predicted from the operation of processes of the form C₁ → C₂.

As a general proposition for English, this is a very unlikely idea, since the language lacks some of the processes (p → k or k → p, for instance) and has most of the others only under contextual conditioning (for example, English does have a process z → s, but only by assimilation to a preceding voiceless consonant). English does, however, have one context-free process affecting postvocalic consonants, namely ŋ → n, so that if there is any truth to the potential-for-alteration hypothesis concerning feature rhyme we should see a correlation between the occurrence of n-ŋ rhymes and the occurrence of n as an alternant of ŋ. As is well known, the process ŋ → n is essentially restricted to the participial morpheme -ing and the words something and nothing; it hardly ever applies to an ŋ in a stressed syllable, as in hang or sing. If there is a correlation between n-ŋ rhymes and the process ŋ → n, the n-ŋ rhymes should largely (if not entirely) involve -ing, something or nothing. In fact, the reverse is true in my data: most of the n-ŋ rhymes involve ŋ in stressed syllables. Of the 21 n-ŋ rhymes, 5, or 23.8%, involve -ing; none involves something or nothing; the remaining 16, or 76.2%, involve ŋ in a stressed syllable.

The following examples are typical:

We gotta get out while we're young
'Cause tramps like us, baby we were born to run
(Springsteen, 'Born to Run')

I'll remember Frank Lloyd Wright.
All of the nights we'd harmonize till dawn.
I never laughed so long.

(Simon, 'So Long, Frank Lloyd Wright')

I conclude that consonantal feature rhyme is not explicable on the basis of English phonological processes. As in the case of subsequence rhymes, the conventions of rhyming extend beyond the properties of

the English varieties these conventions are presumably based on.

6.4. Feature rhymes and vowel allophones. Still another possible way of reducing consonantal feature rhymes to other phonological phenomena has been suggested to me by Patricia Donegan, who proposes that feature rhyme involves nothing more than the phonetic identity of vowels. There are several attractive aspects to this proposal--for instance, the rarity of r-l rhymes could be explained on the basis of the different effects these consonants have on the preceding vowels, as could the rarity of rhymes hinging on the feature of nasality (b-m, d-n, g-ŋ)--but the proposal does not begin to cover all the data. In particular, it cannot possibly explain why m-n and n-ŋ are frequent rhymes while m-ŋ is almost unexampled, nor can it explain the relative commonness of d-z rhymes, even though d and z have (in many dialects) quite different effects on vowels preceding them.

6.5. Feature systems, production, and perception. Feature systems designed by linguists are supposed to specify natural classes of segments with small numbers of feature marks and to specify segments related by phonological processes with marks that are minimally different. There is, of course, no a priori reason why phonologically related segments should be poetically related--nor indeed why phonologically related segments should invariably be those which are similar in production, acoustics, or perception. I have already given some reasons to think that phonological and poetic relatedness, though similar, are in some ways different. There is now a respectable literature comparing phonological relatedness and phonetic similarity,¹⁰ a literature that points to interesting dissimilarities between phonologically based feature systems and phonetically based ones. Since the relationships expressed in poetry are those of language spoken and heard, it makes sense to compare the rhyming schemes found in poetry to the similarities of sounds in speech and hearing.

There are three sorts of studies that might relate to the rock rhyme data: collections of 'slips of the tongue', errors in production (see the studies in Fromkin 1973); collections of 'slips of the ear', errors in the perception of casual speech (Garnes and Bond 1975); and experimental studies of the perceptual similarity of segments, in which 'subjects have been asked to identify consonants in a noise background, to judge which of two alternative consonants is more like a third, and to recall a list of CV nonsense syllables from memory' (Klatt 1968:401). The first two sources are, like rock rhymes, 'natural experiments', and all three must be adjusted so as to be comparable with one another and with controlled experiments, but I will survey these briefly and then consider the remaining studies, all in relation to consonantal feature rhymes in rock music.

6.5.1. Slips of the tongue. These studies are not directly comparable to feature rhyme, since (as Fromkin 1973:20 stresses in her survey) such slips primarily involve syllable-initial consonants and vowels; syllable-final consonants are less commonly involved, though there are examples. Fromkin's single-feature examples (252-4) do show syllable-final pairings that we have already mentioned--for instance, p-k, p-f, and m-n--but there are not enough cases to draw conclusions from.

6.5.2. Slips of the ear. In the data reported thus far, there are no statistics for individual slips, although Garnes and Bond do pick

out the following consonant pairs as particularly common: p-k, t-k, f-θ, r-l. Errors involving p-b, f-v, b-m, b-v, and p-f are also mentioned by Garnes and Bond. These are single-feature differences, but not (by and large) the same ones that figure prominently in rock rhyme.

6.5.3. Perceptual experiments. Again, the existing studies cannot be directly compared to the feature rhyme data, even assuming a correction for relative frequencies. The major problem here is that the perceptual studies have almost entirely been concerned with syllable-initial consonants; the major exception is Singh and Black 1966, which treats intervocalic consonants (though not actually syllable-final ones).

Another difficulty concerns the fact that the perceptual studies have nearly all used speakers and listeners of similar dialect (see, however, Fox 1974 for vowels), although rock music is typically performed by speakers of one variety for listeners of various divergent varieties.

A final difficulty comes from the fact that perceptual studies have dealt with speech carefully articulated in a neutral register, whereas rock music is sung (that is, articulated in a register notably different from ordinary speech and showing certain distortions) and is often careless or casual in its articulation. I know of no perceptual studies using productions in a singing register or in a notably careless style.

Despite the problems in comparability, some results are of interest. Singh, Woods, and Becker 1972 conclude that the best and smallest feature system they examined (one derived from their experimental data rather than devised on phonological grounds) ranks the features in importance: place (front/back), nasality, sibilance, voicing, plosion. The significance of the place dimension was also stressed by MacKay (in the Fromkin volume) for slips of the tongue and is striking for the feature rhyme data, since nine of the twelve most frequent pairs differ in place of articulation. Of this dozen three involve plosion and one voicing, so that only nasality and sibilance (which opposes s z š (ž) č j to the other consonants) are not noticeably employed in rock rhyme.

An especially interesting study in this regard is Klatt 1968, in which the perceptual confusion data of Wickelgren 1966 are re-analyzed to determine the optimum feature analysis for them. Among Klatt's findings are that k and g have a 'slight affinity' (405) for the fricatives and might be classed with them by means of a feature; that v does not seem to function as a fricative perceptually, but rather classes with the sonorants and stops; and that r and l act like stops. There is some correspondence with feature rhymes here, since there are two examples of k-s, one of k-f, and one g-ǰ (involving k and g paired with fricatives); also four d-v pairings (in which v matches a stop); and two cases in which l is rhymed with n, plus one in which it rhymes with d (here l matches stops). Still, these correspondences concern small numbers of examples, and there is a substantial set of disparities between the feature rhyme data and the perceptual similarity data. For instance, p-b, p-f, b-m, and m-n rhymes ought to be common, if there is a close association between features expressing perceptual similarity and rhyming--but

the first three are unexampled in my data, while the fourth occurs but once.

Substantial disparities between feature rhyme and perceptual similarity remain even if we consider specific consonant pairs rather than sets sharing features. At least four sorts of perceptual similarity experiments are potentially relevant: studies of perceptual confusions between pairs; estimates of similarity between pairs, on a scale from 1 to 7; estimates of similarity between pairs, with magnitudes determined by the subject; 'ABX' experiments, in which subjects are asked to judge which of two stimuli is more like an initial stimulus. There are results for studies of all four types in English (though the perceptual studies treat only prevocalic consonants).

First, from the Miller and Nicely 1955 study of perceptual confusions among 16 prevocalic consonants, I have lumped together symmetric confusions (b heard as d and d heard as b lumped together as b-d, for instance) under the most favorable of their experimental conditions (Table XIII, a signal-to-noise ratio of +12 db. and frequency response in the 1000-5000 Hz. range). The most easily confused consonants in this study were, in descending order: b-v, d-g, p-k, f-θ, v-č, č-z, b-f, θ-s, f-v, and (tied) θ-č and s-z. These results do not compare well to the feature rhyme data: to the most frequent feature rhyme, m-n, there corresponds only one confusion; n-ŋ is absent from the Miller-Nicely data, obviously, but the third most common feature rhyme, d-z, appears well down on the list of perceptual confusions, as the 16th most common pair; on the other side, the most common confusions, b-v and d-g, appear in only two of my rhymes.

A study of perceptual errors by children (Graham and House 1970) fits the feature rhyme data better, though still not very well. The eleven most common confusions in this study were f-θ, r-w, s-z, š-č, r-l, m-n; m-l, l-w, and s-š (tied); and p-t and p-m (tied).

Similar differences appear with the Singh, Woods, and Becker 1972 studies of seven-point scaling, magnitude estimation, and ABX judgments on 22 prevocalic consonants. On seven-point scaling (their Table V) the most similar consonants, in order, are: f-θ, b-v and č-z (tied), f-s, θ-s, p-t, š-č, v-č, p-h and d-č (tied), and p-k, b-d, t-k, and s-z (all tied); the pair m-n is in 22nd place. On magnitude estimation (their Table VI) the rankings are č-z, f-θ, v-č, b-v and r-w (tied), θ-s, b-d, č-š and š-č (tied), f-s, v-z and s-z (tied), d-v and d-č (tied), and p-t; in this study, m-n was the second most dissimilar pair. For ABX judgments (their Table VII) the order is b-v, s-z, f-θ, š-č, č-š, r-w and θ-č (tied), d-č and m-n and t-k (tied), f-v and b-θ and p-b (tied) and k-g; this time, m-n appears in eighth place.

The only pairs close to the top in all five studies are b-v and f-θ, each of which is evidenced by only two rhymes. This difference between rhymes and perceptual studies is especially striking since the substitution of f for θ is so common in nonstandard dialects. In the other direction, the pair that is by far the most frequent in

feature rhymes, m-n, is not particularly high in studies of perceptual similarity.

It seems to be true that, though there are intriguing relationships between production/perception and feature rhyme, the poetic scheme cannot be predicted in detail from the phonetic data (though, perhaps, studies of the perceptual similarity of syllable-final consonants would give closer results). The relationship between poetic relatedness and perceptual similarity is thus rather like the match between 'tongue twister relatedness' (likelihood that alternating the segments will produce difficulties in production) and perceptual similarity: Schourup 1973:590 cites s-s̄, p-f, θ-s, and e-ε as producing difficulties in twisters, while t-d, f-v, f-s, and i-a do not, though there is no reason to suppose that the first pairs are (in general) perceptually closer than the second pairs--nor do they show any closer relationship in rock rhymes than the second pairs do.¹¹

7. Feature rhyme: vowels. Of the grand total of 700 examples 94 (or 13.4%) show rhyme between distinct vowels. These are quite scattered; there are 24 different pairings in the sample, with only the following having three or more instances in the data:¹²

i-ε:	19 examples
ʌ-ɔ:	10
i-e:	9
ʌ-a:	8
u-o:	6
ε-æ	} 4
ε-e	
a-ɔ:	3

Notice that most of these pairs are only one feature apart in anybody's feature system. The only problematic cases involve a, ʌ, and ɔ. In the feature system of Chomsky and Halle 1968, these vowels are distinguished as follows:

	round	low
a	-	+
ʌ	-	-
ɔ	+	-

The pairs a-ʌ and ʌ-ɔ are thus one feature apart, but a-ɔ is a two-feature difference. Any use of only two distinctive features to specify three vowels necessarily involves making one pair two features apart--and if one pair must be more distant than the others, the feature rhyme data would suggest it should be a-ɔ, as in the Sound Pattern system.

The data above are skewed in various ways. Of the 19 i-ε pairs, four have the vowels preceding n (for example, winds-ends), and three further examples have the vowels before l (as in will-tell). The rhymes here probably reflect the tendency for i and ε to neutralize before n and l in various English dialects. Another reflection of processes operating in dialects is the fact that all but two of the

nine i-e examples are before r (near-care, for instance), and all six of the u-o examples are (as in sure-more), again corresponding to a dialectal neutralization.

Some of the data should simply be discarded. All four of the e-e rhymes involve the word again, which in popular verse (as in serious poetry) can be treated as having e, regardless of its actual pronunciation in performance. Similarly, two of the ten i-i examples involve the word been, which can by convention be treated as having i, whether or not it is so pronounced.

Finally, there are some rhymes in which particular words are very heavily used: thus, of the ten a-o examples, five use the word gone, three on, and two off.

If we remove these examples from the data, only four pairs occur with any frequency: i-e, e-a, i-i, and a-a (though the figures involved are so small that a meaningful statistical comparison between them and any other figures is impossible). Typical examples:

My experience was limited and underfed,
 You were talking while I hid,
 To the one who was the father of your kid.
 (Dylan, 'Love is Just a Four Letter Word')

Old Reilly stole a stallion
 But they caught him and brought him back
 And they laid him down on the jail house ground
 With an iron chain around his neck.
 (Dylan, 'Seven Curses')

Well the technical manual's busy
 She's not going to fix it up too easy
 (Joni Mitchell, 'Electricity')

Advertising signs that con you
 Into thinking you're the one
 (Dylan, 'It's Alright Ma (I'm only Bleeding)')

Now I turn again to the question of the relationship between feature rhyme and perceptual similarity. Fromkin's published examples of 'single-feature' slips of the tongue do not include any vowel cases; in a larger corpus, presumably, they would be present but relatively infrequent, as in my rock rhyme data. As for slips of the ear, Garnes and Bond (1975:216) say, 'Although errors in the identification of stressed vowels are relatively rare, some interesting examples do occur. The most common errors, by far, involve confusing /e/ and /a/'. This finding is consistent with the data from rock lyrics.

When we compare vocalic feature rhymes to experimental results on perceptual similarity, however, the fit is not very good. For instance, Singh and Woods 1970 had subjects judge pairs of vowels (spoken in isolation) as to their dissimilarity on a scale of 1 to 7. The first six most similar vowels in their results include three of the four most common vocalic feature rhymes, marked with an asterisk in the following chart:

pair	dissimilarity rating
I-e	1.83
ε-e	2.00
*I-ε	2.22
*I-i	2.80
Λ-U	3.47
*ε-æ	3.55

The perceptual similarity of e and I does not correspond to a phonological or poetic relatedness. Nor were ε-e and Λ-U rhymes particularly frequent. And one of the most common rhymes, Λ-a, came out sixteenth on Singh and Woods' list, with a dissimilarity rating of 4.36.

The perceptual confusions in the first important study on English vowels (Peterson and Barney 1951) are much closer to the feature rhyme data, though they are still not perfect. In the Peterson-Barney study, the leading pairs, in order, were a-o, ε-æ, I-ε, and u-Λ.

8. Feature rhyme: syllabicity. There are only six examples of this type in the 700 examples, and most of these might have been classified as perfect rhymes, as in these lines from Dylan's 'John Brown':

I'm a tryin' to kill somebody or die tryin'
 But the thing that scared me most was when my enemy came close
 And I saw that his face looked just like mine

Further analysis does not seem useful.

9. Rock rhyme and equivalence class rhyme. It is useful to compare rock rhyme, as I have discussed it above, with another system of rhyming, also looser than perfect rhyme but tighter than assonance. There seems to be no accepted name for this system; I suggest equivalence class rhyme. It can be illustrated by the Old Irish rhyming technique, in which 'every vowel must normally be identical (the identity including identity of quantity), and every consonant (when the consonants are single and not in groups) must normally be balanced by a consonant belonging to the same phonetic class and having the same quality' (Murphy 1961:30), the phonetic classes in question being six--(a) voiced stops; (b) voiceless stops; (c) voiceless spirants; (d) voiced spirants and 'weakly-pronounced' liquids; (e) 'strongly pronounced' liquids; and (f) s--and the qualities in question being palatalization and labialization. This system is freer than rock rhyme in one sense, since it permits all of v v̄ č ɣ l n r to rhyme, even though pairs like v-l, v-n, and ɣ-l are not particularly close in (anyone's) feature terms. It is more restrictive than rock rhyme in another sense, since it does not permit a pairing like t-d, nor the rhyming of palatalized-nonpalatalized pairs.¹³

10. Conclusions. I have argued that the rhyme scheme used in rock lyrics is not merely a great deal of assonance plus some consonance, but rather that this scheme consists of subsequence rhyme plus feature rhyme, and these compounded and linked. However, exactly which subsequences count as rhyming, and exactly which features figure

in rhymes, is a complex matter and deserves further study. I have also argued that the principles of English rock rhyme do not follow in any obvious way from other relationships between segments--from relatedness expressed in the phonological processes of English, from similarity in production (as indicated by slips of the tongue), or from perceptual similarity (as examined by several types of studies)--or from frequency considerations. In rock rhyme, as in equivalence class rhyme, we see artistic conventions using some rather abstract aspects of phonological systems:

You're my song, music too, magic to end
I'll play you over and over again
(Jennings and Kerr, 'Somewhere in the Night')

Footnotes

*My thanks to Mary Jo Hood, who collected many of the examples and helped classify them; to Sara Carnes and David Stampe, who provided helpful comments and suggestions about literature; and to Kat Momi, John Perkins, and Jay Pollack, who pointed me to sources of nice examples and/or advised me on more substantive matters. I also thank the members of the CLS audience who voiced objections or puzzles; I have tried to make matters clearer for them.

The title is from 'Bad Boy' by Williams, as recorded by the Beatles on Beatles VI.

1. The terminology in these matters seems hopelessly confused: perfect rhyme is also called full rhyme, pure rhyme, strict rhyme, true rhyme, or simply rhyme, while imperfect rhyme is also called near rhyme, slant rhyme, oblique rhyme, popular rhyme, off rhyme, approximate rhyme, or half rhyme. Some writers use certain of these terms for specific types of imperfect rhymes; Thrall, Hibbard, and Holman 1960:106 give half rhyme and slant rhyme as synonyms for consonance (Deutsch 1962:124 gives half rhyme and oblique rhyme, plus five other terms), while Untermeyer 1969:263 gives half-rhyme as a synonym for apocopated rhyme and uses popular or imperfect rhyme for assonance.

2. My sources were published collections of songs recorded by the Beatles (jointly and individually), Bob Dylan, and Chicago; the May 1976 issue of Hit Parader magazine, which contains the lyrics to 32 hit songs by various writers; and printed lyrics accompanying records by Elton John, Bruce Springsteen, James Taylor, Laura Nyro, Traffic, Moody Blues, The Who, Yes, Neil Young, Joni Mitchell, Helen Reddy, Simon and Garfunkel, and U.S.A.

3. I exclude the citation of 'Twinkle, Twinkle, Little Star' in Beckson and Ganz 1975:119, although it is indeed packed with assonances, because the words showing assonance are not in position to rhyme with one another.

4. However, 16 of these occurrences involve the word time in a compound rhyme including m-n. And 11 of these 16 occurrences have time rhymed with mind. This particular rhyme is a cliché, though goodness knows a useful one, in rock lyrics.

5. And in fact there is a connection between Dylan and the Beatles: 'in the course of time the Beatles "grew into" oral poetry, largely by way of Dylan's example' (Mellers 1973:34), though Dylan's rhymes are much more often imperfect than are the Beatles', and Dylan even uses assonance (rather than rock rhyme) occasionally, as in these parallel lines from 'The Times They Are A-Changin' '--

If your time for you is worth savin'...
 And there's no tellin' who that it's namin'...
 Your old road is rapidly agin'...
 Will later be past the order is rapidly fadin'...
 For the times they are a-changin'

6. Also the auxiliaries is and has are almost always deletable in Black English, while in rock rhyme the contracted auxiliaries virtually never match zero. But since lines ending in an auxiliary verb should not be at all common in verse, there is a simple explanation for this disparity between rock rhyme and nonstandard dialects.

7. Although there were no f-s examples in my data, David Stampe has supplied me with an example from a blues lyric by Josh White. White rhymes myself and else in this example. A more recent example, collected since the original sample of 700, occurs in this compound rhyme from Brel's 'La Colombe', as translated by Alasdair Clayre:

Why the engine's groaning cough
 As it strains to drag us off
 Into the holocaust.

8. There are no direct p-f examples in my data, but there is one such pairing achieved by linking: in 'A Hazy Shade of Winter', Simon and Garfunkel rhyme high with both ripe and life. A genuine example, collected since the original sample of 700:

The sky is clearing and the night
 has cried enough
 The sun it comes, the world to
 soften up.

(Stills, 'Carry On')

9. This dozen includes several dubious pairs--words I was not sure were meant to rhyme, and pairs from lyrics in which assonance rather than rock rhyme was probably the scheme. I will list the pairs here for reference, and discuss them no further: p-v, d-θ, t-z, c-z, j-s, l-v, d-m, t-m, p-z, t-v, k-z.

10. For perceptual studies this literature begins with Miller and Nicely 1955 and includes Wickelgren 1966, Singh and Black 1966, Singh 1970, Graham and House 1971, Klatt 1958, and Singh, Woods and Becker 1972. There is, of course, an enormous body of studies on articulation and acoustics.

11. It is possible to imagine still more ways of getting at the relationship of segments in a language. F. Christian Latta has suggested to me that the substitutions used in taboo avoidance might compare well with other data: note (closely related) n for m in darn for damn, g for k in frig for fuck--but (distantly related) u for I in shoot for shit, and k for l in heck for hell. Latta also suggests examining what might be called 'imperfect puns', as when a roller skating rink decides to call itself The United Skates of America (with k for t).

12. There are also 13 examples in which r or ʀ is involved: four examples of ʀ-er, two of ʀ-ə, and one each of ʀ-ε, ʀ-ar, ʀ-o, ʀ-o, ɔr-i, ar-o, and ʀ-l. There would be more ʀ-ə rhymes if some of the examples had not been classed as perfect rhymes, thanks to their having been performed by speakers of r-less dialects. The remaining examples are two occurrences each of i-ay and o-o, and one each of u-ʌ, i-aw, o-aw, and a-aw.

13. From his examples, it is not clear whether it is feature rhyme or equivalence class rhyme that is going on in Carinthian German folk poetry as described by Maher 1972. In all of his examples the nasals m nŋ count as rhyming with one another. This could, however, be the result of their sharing features in pairs, or the result of a rhyming scheme that counted any nasal as equivalent to any other.

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