

DISSERTATION REVIEW

A generative approach to rhyme: An Optimality approach

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The advent of Optimality Theory (Prince and Smolensky 1993) has made possible the rigorous expression of intuitions which eluded satisfactory formal treatment under stepwise serial approaches. A common (and excellent) example is the placement of infixes such as Tagalog *-um-*, which occurs after the first onset of the word: *s-um-ulat* ‘write’, *gr-um-adwet* ‘graduate’. It has long been observed that such infixation occurs to avoid a less favorable syllable structure (cf. Anderson 1972), but it is the violable, surface-oriented constraints of OT which have provided the means to make this intuition an explicit part of the analysis.

Another example, considerably less discussed (but see Kiparsky 1973), is the similarity between the (partly) identical structures found in reduplication (e.g. Manam *tumura-mura* ‘cold (sg.)’) and the phenomenon of rhyming words (e.g. *pleasure : treasure*). In her interesting and wide-ranging dissertation, Holtman shows that the Correspondence subtheory of OT proposed by McCarthy and Prince (1995) makes possible a formal analysis of poetic rhyme and its many complexities. On the basis of this analysis we can then make clear comparisons between the paralinguistic phenomenon of rhyme and more core linguistic operations such as reduplication. As might be expected, there are important similarities but also important differences as well.

1. Correspondence

Previous generative accounts of reduplication have typically involved two steps: the **base** is copied in some form, and then the copy is mapped or reduced to a template of some predefined shape, creating the **reduplicant** (cf. Marantz 1982, Steriade 1988). Thus in Manam (Lichtenberk 1983), the root *tumura* is copied to form intermediate *tumura-tumura*, and then the copy is reduced to a size of two moras, yielding correct *tumura-mura*. This approach has various problems even for the analysis of reduplication (see especially McCarthy and Prince 1995), but is wildly untenable in the analysis of poetic rhyme. Consider the Shakespearean lines given in (1) above by Holtman: how can the base “...if ever, now” be mapped to a template to produce “...make me bow”? Obviously it is just the very last part of the lines which stand in a relationship as “rhyme fellows”, with the majority of the lines quite independently determined. This situation is significantly different from reduplication, a difference which makes the copy-and-reduce approach of no use here. But Holtman shows persuasively that Correspondence Theory — which already offers a superior account of normal reduplication — is also directly applicable to poetic rhyme. In other words, the theoretical advance that Correspondence represents is further confirmed by its ability to extend quite straightforwardly to the analysis of rhyme.

The Correspondence approach to reduplication works as follows. Various types of constituents stand in a relationship of **faithfulness**: for example, quite independent of reduplication, an output form is constrained to be faithful to the properties of its input form, to prevent a word such as /*tumura*/ (and any other input word) from becoming less-marked [baba]. In the case of reduplication, the same sort of relationship holds **within** the output form: the reduplicant is constrained to be faithful to the base. Faithfulness is enforced by two types of constraints: those referring to entire segments, and those

referring to the content of those segments. MAX, for example, ensures that as many segments occurring in the base as possible will be retained in the reduplicant, favoring *tumura-mura* over **tumura-ura* even in a language like Manam that permits onsetless syllables. The IDENTITY family of constraints, on the other hand, ensures that the content of corresponding segments is the same; this prevents, for example, **tumura-baba*. Crucially, these correspondence relationships are defined on the output representation, without any need to first create a full copy and then reduce it. Numerical indices can be used to denote the correspondents.

(1) tumura-mura
 123456 3456

This output violates MAX since segments 1 and 2 have no correspondent in the reduplicant, but the violations are forced by a higher-ranking templatic requirement on the size of the reduplicant (two moras in Manam); this is a defining property of partial reduplication.

As Holtman shows, the essence of this approach extends nicely to the analysis of poetic rhyme. Consider the rhyming words in a couplet from Thomas Hardy's *A Philosophical Fantasy* (Holtman, p.104), *marshal* and *partial*.

(2) m a r s h a l p a r t i a l
 1 2 3 4 5 6 1 2 3 4 5 6

Here we find perfect correspondence between segments 2-6. The onset consonants are nonidentical, but as discussed below this nonidentity is a required property of rhyme in general. The central insight that Correspondence Theory provides is that the IDENTITY

relations can be defined purely on the basis of surface representations. In poetry, Correspondence provides a fully explicit means of evaluating the existing rhyme pattern, without the gratuitous (and fatal) complication of imposing an operational derivation on the poem.

2. Constituents in Correspondence

Two important questions arise from the indices given in (2): what about the rest of the lines which contain the rhyming words, and what should we do about the onsets? The first question has a more straightforward answer. As Holtman illustrates above in her example (1), the Rhyme constituent (in the formal role of the reduplicant) has a limited size. The Base itself can be considered the entire first line. I illustrate this below for the Hardy rhyme, also indicating strong (x) and weak (.) metrical positions, together with complete indices.

(3) . x . x . x .
 [A universe to marshal]_{Base}
 a bcdefgh ij 1234 56

 . x . x . x .
 What god can give but [partial]_{Rhyme}
 1234 56

The segments indexed a-j in the Base have no correspondents in the Rhyme, just as the segments /tu/ in Manam have no correspondents in the reduplicant *-mura*. This state of affairs violates MAX, of course, but the templatic statement of the Rhyme constituent

forces the violations. In unusual cases the poet may repeat an entire line, indicating the ranking has been reversed to give priority to MAX; this is one of several cases in which factorial typology correctly yields variant poetic styles, parallel to variant grammars.

Holtman notes that the Rhyme constituent cannot be defined morphosyntactically: the string that rhymes can be smaller than a word (*away : decay*) or can span words (*show it : bestow it*). Descriptively, the rhyme extends from the last stressed vowel to the end of the line. For Holtman (p.127-133), following Prince (1989), this is formalized as the final “metrical position”, which includes not only the last strong position (x) but also every following weak one (.). In (3), then, the metrical position for *partial* is of the shape [x .], while in example (1) from the summary above the relevant metrical position is just [x]. Here the metrical position is a strictly poetic construct, and is not isomorphic with foot constituency; notably, in iambic meter it always excludes the weak left branch of an iambic foot (. x). In fact, since it only includes weak material to the right, the metrical position can be thought of as inherently trochaic. Wider typological implications of this point of view remain to be explored, but it does call to mind work such as van der Vijver (1995), suggesting that even in seemingly iambic stress systems the foot is basically trochaic; as well as Hung (1994), who proposes a RHYTHM constraint which requires a weaker beat after every stressed syllable.

The basic constraint on the Rhyme constituent, then, is that it occupies the final metrical position. Since this position is composed of **syllables**, the onset to the stressed vowel is also part of the constituent. As Holtman points out, this inclusion is actually necessary if we are to define the rhyme correctly. While the onset might seem to be excluded from the “rhyming part” of the word, and therefore can be ignored, in fact the onset in the Rhyme is crucially distinct from the onset in the Base: fully homophonous words such as *tail : tale* are not valid rhyme fellows, except in the unusual *rime riche* style Holtman illustrates in (3) above. (It is worth noting that material immediately

preceding the onset does not have to be distinct: the pair *interleave* : *interweave*, for example, is a well-formed rhyme. The onset is crucially included in the Rhyme constituent to enforce distinctness, while preceding material is not taken into account, and is free to be identical.)

To express the necessary dissimilarity of the onsets, Holtman introduces the constraint ONSET(DIS). Such a requirement is not found in normal reduplication of the *tumura-mura* type; but it does hold for echo words in numerous languages (McCarthy and Prince 1986, Cole 1994). For example, English *shm-* (borrowed from Yiddish) cannot be used with a word that already begins with that consonant cluster: *table-shmable* is well-formed, but *shmaltz-shmaltz* is not. Echos with such words are sometimes simply not permitted (as with Turkish *m-*), or subject to an alternate strategy (as with Hindi *v-* replaced by zero, and the English *shmaltz-shpaltz* reported by McCarthy and Prince 1986). Bengali *t-* echos do permit identical onsets, the expected factorial result of a low-ranking ONSET(DIS). While echo words are rather peripheral to grammar, they nevertheless lend support to the use of ONSET(DIS) in the analysis of poetic rhyme.

The precise implementation of the constraint leads to difficulties, however. When only one consonant is in each onset, as in (2), Correspondence provides a straightforward framework for comparing the onset in the Base with that in the Rhyme. When one onset is empty, e.g. *aim* : *game*, a possible approach is to permit /g/ to correspond with zero; Holtman (p.144f) considers this option but chooses to incorporate into the formulation of ONSET(DIS) the statement that if the Base has no onset then the Rhyme must have one.

A further complication arises when an onset contains a cluster. Holtman proposes that the consonant cluster stands in correspondence with the other onset as a **unit**; for instance, in *bleak* : *beak* the [bl] corresponds to [b], with which it is of course not identical. While such multiple correspondence has been proposed to account for coalescence of segments (cf. Lamontagne and Rice 1995), the descriptive phenomenon is

not comparable to what we see in reduplication; in Tagalog *ta-trabaho* the two /t/'s are direct correspondents (with IDENTITY enforced), while the lack of a correspondent for /r/ is a MAX violation.

Given that Holtman's analysis of rhyme is based on an analogy with reduplication, I think it would be worth exploring an approach which avoids multiple correspondence. For example, if some notion of correspondence with zero can be elucidated, one which of course counts as nonidentical, then the two /b/'s in *bleak* : *beak* can correspond directly, while the nonidentity of /l/ and \emptyset will serve to satisfy ONSET(DIS). This approach would also simplify the statement of ONSET(DIS) since no stipulation regarding the presence of onsets will be necessary. A remaining question is whether an actual onset constituent must figure in the simplified formulation of ONSET(DIS) — e.g. “the correspondents located in the onset must not all be identical” — but even if it is so, that may be one of the properties that distinguishes non-core linguistic competence such as poetry from core phonology, where much recent work eschews formal reference to the onset (cf. McCarthy and Prince 1986, Zec 1988, Hayes 1989).

3. Rhyme styles

As mentioned above, a general property of the Rhyme constituent is that it is isomorphic with the final metrical position. To distinguish various types of rhyme, further restrictions must be imposed. For example, one rhyme style permits only “masculine” (monosyllabic) rhymes, e.g. *go* : *blow*. Holtman (p.128) quite reasonably characterizes this style by the additional constraint that the metrical position must be a nonbranching foot. If “feminine” (disyllabic) rhymes are also permitted, then this constraint is not enforced (i.e. is low-ranked).

Holtman also proposes a feminine-only category, characterized by an obligatorily branching constituent; she acknowledges that this is a minor rhyme style, and I wonder if it is truly necessary as a formal category. Of Shakespeare's 154 sonnets, for example, only Sonnet 20 is purely feminine. More than half the sonnets are masculine only, while the others include a varying number of feminine rhymes with the masculine. My concern is, should Sonnet 20 (all feminine) really be considered a distinct style from Sonnet 87 (all feminine but one)?

A bit of statistical reasoning is appropriate here. Given a set of poems which permit both masculine and feminine rhyme, a random distribution of those rhymes is likely to produce some poems which are masculine only and some which are feminine only, together with varying mixes of masculine and feminine in the other poems. The existence of a single feminine-only sonnet does not indicate that Shakespeare used a distinct style for that sonnet, only that he happened (for aesthetic or other reasons) not to use any masculine rhymes.

Certainly we need "masculine only" as a separate style — as Holtman points out (p.101), Pope's *Iliad* contains almost nineteen thousand lines without a single feminine rhyme, which is not a plausible accidental gap. Given the preponderance of masculine rhyme in the sonnets, it may very well be that Shakespeare used two styles: "masculine only" and "masculine and feminine". But this claim can also be evaluated statistically: if, in the poems that explicitly contain both rhyme types, there is a preponderance of masculine, the large number of masculine-only sonnets may also be accidental (as is, I suggest, the single feminine-only sonnet).

Even if the feminine-only category is necessary I suspect that it will play a less important role than first appearances might suggest. Consider the question of how formal constraints on rhyme (and meter, etc.) interact with the aptly named "poetic license", which is essentially the freedom to transcend these constraints. The answer is sure to be

complex, but one that has to be confronted in constructing a theory of formal conditions on literary expression. For example, Holtman (p.175) cites Louis MacNeice's feminine-only poem *Bagpipe Music*: it is 34 lines, so that accidental omission of licit masculine rhymes seems unlikely; yet all the rhymes are also "complex", i.e. not composed of identical segments (see section 4 below). How are we to distinguish (i) a formal style that categorically excludes masculine rhyme (and perfect rhyme) from (ii) a decision by the poet to skew the individual choices of rhymes permitted by a formal style, in order to achieve some artistic effect? Such questions are obviously beyond the scope of one dissertation, but are an important area for exploration in future research in this area.

Alongside the masculine/feminine distinction, the main aspect of templatic rhyme style that Holtman discusses is whether mosaic rhyme is permitted, i.e. a Rhyme constituent (or corresponding Base) that spans more than one word. Her interesting analysis takes advantage of the fact that prosodic foot structure (not to be confused with metrical positions) is word-internal in most languages, including English and Dutch which provide the corpus for the study. Thus while the two rhyming syllables in *marshal* (rhyming with *partial*) can be footed together, those in *show it* (rhyming with *bestow it*) cannot, because the foot does not extend beyond the word. (The unstressed *it* is adjoined to the preceding prosodic word; cf. Selkirk 1995.) As a result, a feminine rhyme style which excludes mosaic rhymes can be characterized by a branching prosodic foot: by constraints on prosodic structure, the second syllable must come from within the same word. For a style that permits mosaic rhyme, the branching constituent is the metrical position, which is indifferent to prosodic foot structure and therefore to word membership. Since masculine mosaic rhymes are marginal (e.g. *wont* : *upon 't*), and seem to be attested only in styles that also permit feminine mosaic, Holtman analyzes the masculine-only rhyme style as a nonbranching foot, which inherently excludes mosaic rhyme.

4. Complex rhyme

Holtman devotes a chapter to a rather different question from rhyme templates, namely an exploration of “complex” rhymes whose correspondences deviate from perfect identity: cf. *spirit* : *merit*, with an imperfect vowel match, and *dame* : *lane*, with an imperfect consonant match. (Nonidentical consonants are particularly well attested in more popular formats such as nursery rhymes and song lyrics.) Holtman’s survey of the literature, as well as her own research, show that the mismatches generally involve just one phonological feature (such as place of articulation), and that some imperfect rhymes are particularly common (such as nonidentical nasal consonants, and vowel height differences). To express a rhyme style which permits nonidentity, Holtman introduces the constraints PHONSIM-C and PHONSIM-V, which impose a requirement that correspondent consonants and vowels be similar (but nonidentical).

As mentioned above, I think there may be a role in the analysis for poetic license which is not necessarily to be encoded in the same way as the basic constraints defining the system. The formulation of PHONSIM-C, for example, has to include the notions of both “similarity” and “nonidentity”; it also has to exclude the onset from its purview, since that is not required to be similar (p.264). This constraint dominates IDENTITY, which becomes irrelevant, since PHONSIM-C largely incorporates its effect. An alternative approach might be to assume that some poets (and lyricists) adopt a loose interpretation of the existing IDENTITY constraint, so that a certain amount of similarity is sufficient for satisfaction. Just how much similarity must exist is an interesting question, as Holtman shows; but it does not have to be expressed as a new constraint. An advantage of this approach is that the independence of the onset is already established by ONSET(DIS) » IDENTITY.

A final matter discussed briefly by Holtman is “subsequence rhyme”, in which there are segments with no correspondent in the rhyme fellow, e.g. the /t/ in *first* : *purse* and the /v/ in *plays* : *waves*. While a fully explicit analysis remains to be worked out, I suspect that the means used to deal with the lack of one-to-one correspondence in subsequence rhyme may shed light on the best treatment of onsets with different numbers of consonants, mentioned above.

5. Conclusion

Holtman’s dissertation is a provocative look at how the formal mechanisms of Optimality Theory can help us to analyze and to understand patterns of poetic rhyme. Her analysis accounts for an impressive range of data, and the discussion sets forth the considerable range of phenomena that need to be accounted for. This study will be indispensable to any future work on rhyme.

References

- Anderson, Stephen R. 1972. On nasalization in Sundanese. *Linguistic Inquiry* 3.253-268.
- Cole, Jennifer F. 1994. *The prosodic domain hierarchy in reduplication*. Dissertation, Stanford University.
- Hayes, Bruce. 1989. Compensatory Lengthening in Moraic Phonology. *Linguistic Inquiry* 20, 253-306.
- Hung, Henrietta. 1994. *The rhythmic organization of edge constituents*. Dissertation, Brandeis University.

- Kiparsky, Paul. 1973. The role of linguistics in a theory of poetry. *Daedalus* 102.3, 231-244.
- Lamontagne, Greg, and Keren Rice. 1995. A Correspondence account of coalescence. *University of Massachusetts Occasional Papers* 18, 211-223.
- Lichtenberk, Frantisek. 1983. *A grammar of Manam*. Honolulu: University of Hawaii Press.
- Marantz, Alec. 1982. Re reduplication. *Linguistic Inquiry* 13, 483-545.
- McCarthy, John J., and Alan S. Prince. 1986. Prosodic morphology. Ms., University of Massachusetts, Amherst, and Brandeis University.
- McCarthy, John J., and Alan S. Prince. 1995. Faithfulness and reduplicative identity. *University of Massachusetts Occasional Papers* 18, 249-384.
- Prince, Alan S. 1989. Metrical forms. In P. Kiparsky and G. Youmans (eds.), *Phonetics and Phonology I: Rhythm and Meter*. New York: Academic Press. 45-80.
- Prince, Alan S., and Paul Smolensky. 1993. Optimality Theory: Constraint interaction in generative grammar. Ms., Rutgers University and University of Colorado, Boulder.
- Selkirk, Elisabeth O. 1995. The prosodic structure of function words. *University of Massachusetts Occasional Papers* 18, 439-469.
- Steriade, Donca. 1988. Reduplication and syllable transfer in Sanskrit and elsewhere. *Phonology* 5, 73-155.
- van der Vijver, Ruben. 1995. For the love of trochees. *Phonology at Santa Cruz* 4, 69-83.
- Zec, Draga. 1988. *Sonority constraints on prosodic structure*. Dissertation, Stanford University.