

Constraints on Rhyme and Form in English Poetry

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0. Introduction

This paper represents an attempt to apply the tools of Optimality Theory (OT) to the patterns of rhyme that occur in poetry. Although previous scholars have used linguistic theory to examine the phenomenon of rhyme before, such studies have usually focused on the relationship of rhyme to stress or syllable structure, rather than looking at the “big picture” of how rhyme occurs across lines. Recent work by Tranel and Wu (2001) on Chinese Regulated Verse, however, has shown that rhyme schemes are amenable to analysis in an OT framework. This paper can be seen to be a continuation of their work, applying the same ideas to a broader sample of poetry.

What makes the Tranel and Wu approach exciting is the fact that, unlike many previous accounts, their proposed constraint hierarchy does not include any special poetry-specific constraints. They show that restrictions on form and rhyme scheme are a result of a particular ranking of the same constraints that govern normal speech. This suggests that, although poetry is usually viewed as an artificial use of language far removed from everyday speech, a more accurate picture is that poetry simply reveals in a purer form constraints and tendencies that are obscured, but present, in the language we use everyday.

The goal of this paper is to motivate the view that rhyme schemes are generated by OT grammars by looking at the patterns that are attested in English poetic quatrains. I will argue that on such a view, the set of schemes that are unattested, i.e. ill-formed, can be predicted by a factorial typology of the set of constraints that govern rhyme.

In §1 I set the stage by introducing the relevant data. In §2 and §3, I outline a set of constraints that determine rhyme schemes and motivate them by comparing their factorial typology to the patterns that are observed in English poetry. Section 4 looks at a few examples of rhyming poetry in other genres and languages that might be taken as counterexamples to my claims. Finally, §5 concerns the rhyming properties of tercets, and §6 contains a summary of results and some concluding remarks.

1. Quatrain rhyme schemes

A quatrain is a unit of four lines of poetry; it may either stand alone or be used as a single stanza within a larger poem. The quatrain is the most common type of stanza found in traditional English poetry¹, and as such is fertile ground on which to test theories of the rules governing rhyme schemes. If a given scheme sounds well-formed to English speakers, we should be able to find plenty of examples of it across poetic genres; conversely, if a pattern is extremely rare or unattested, we will be justified in excluding it as a possible output for our grammar.

In a four-line structure, there are fifteen logically possible ways that the lines may rhyme (or not rhyme) with each other. Using letters to represent lines, the possibilities range from AAAA, in which all lines share the same end rhyme, to XXXX (X representing a line that rhymes with nothing else), an example of “blank” or “free” verse.

Given these fifteen possibilities, and the popularity of the quatrain across several centuries, we might expect to find every possibility exemplified by a large sample of actual poems. However, this is not the case. Only eight of the combinations are widely used—the other seven are found only rarely if at all. The division is illustrated in (1):

¹ I somewhat arbitrarily use this term to refer to all poetry written in Modern English before 1900.

(1) Rhyme schemes attested in quatrains

(a) Attested	(b) Unattested
AAAA ABAB AABB XAXA XXXX ABBA AXXA AAXA	AAAX AAXX XXAA AXAA AXAX XAAA XAAX

Not only are the forms in (b) rare—they also sound ill-formed. I will claim that this is because each of the forms in (a) can emerge as an optimal output under a certain ranking of rhyming constraints, while none of those in (b) can be produced no matter how the constraints are reranked.

The next section discusses the nature of poetic grammars, and describes the framework within the set of rhyming constraints will be described.

2. Poetry and OT

The basic proposal I argue for in this paper is that restrictions on form in traditional poetic genres are the result of OT grammars. I will claim (following Tranel and Wu 2001) that the constraints that make up these grammars are not entirely novel, but rather extensions of constraint types that have already been proposed to account for ordinary language phenomena. But before I begin presenting evidence for this claim, it is worth briefly discussing how a poetic grammar must be different than one that operates in normal speech.

Hayes (to appear) points out that typical OT grammars are essentially derivational: they take an underlying form as input and produce a surface form as output. It is usually assumed that every possible input has some corresponding output. This cannot be how grammars work in poetry, however. We cannot take a random sentence, feed it into a grammar, and have a metrically well-formed output produced as a result. Rather, a poetic grammar simply evaluates a given form and decides whether it is well-formed or not. Ill-formed inputs do not result in repairs that are automatically performed. Poetic grammars are thus what Hayes calls *inventory grammars*, similar to the phonotactic constraints that determine a language's phoneme inventory. Such a grammar merely defines a set of legal structures.

Hayes, following work by Baković and Keer (2001), suggests that grammatical forms are those that the grammar maps onto themselves. In other words, a form will be considered legal only if, when taken as an input, the optimal output that emerges from the constraint hierarchy is identical. I will also make use of this intuition, although in a slightly modified way. I assume that a quatrain rhyme scheme is ill-formed if it cannot emerge as optimal under any constraint ranking, i.e. if it is harmonically bounded by other candidates. I am thus attempting to predict not the set of well-formed structures within a given genre (where a single genre presumably corresponds to a subset of the possible constraint rankings), but at the set of all well-formed structures across genres.

Another point on which my approach differs from that of Hayes is the status of the metrical constraints. In Hayes' model, these constraints inhabit a metrical component (what he calls the *comparator*), separate from the regular constraint hierarchy. Only candidates that are winners in both components are grammatical. I assume only one

constraint ranking, in which metrical and normal constraints commingle. Furthermore, I restrict the allowable metrical constraints to those that are clearly parallel to constraints that are independently motivated for ordinary language. For example, constraints that require lines to rhyme are analyzed as anchoring constraints in which the elements in correspondence are lines rather than segments.

Poetry thus represents the emergence of prosodic constraints that are always present in the grammar, but are usually subordinate to the needs of faithfulness. In normal speech we don't have the luxury of eliminating outputs that aren't prosodically perfect; this would make communication much more difficult. But because poetry is a consciously composed art form whose purpose is not simply efficient communication, it can afford this luxury.

In formalizing such a grammar for rhyme, I will use constraints to represent two conflicting forces—one that requires certain lines to rhyme with others, and another that prohibits rhyming. The first can be seen as a natural extension of the IDENT constraints that require elements in correspondence to be identical (e.g., between input and output or base and reduplicant). The motivation for the second force, militating against identity, is less obvious and calls for some discussion.

It seems clear that if constraints requiring rhyme are present in the grammar, then constraints preventing it (whether directly or indirectly) must also be present. Although faithfulness constraints could conceivably play this role, I feel that such an analysis would predict some poem types that would sound ill-formed. The intuition is that rhyming poetry does not simply specify that certain lines must rhyme, while leaving other lines free to either rhyme or not at the whim of the poet; rather, if two lines are not

required to rhyme in a given poem type, they must not rhyme. I will use the markedness constraint NO-RHYME to represent these effects (the formal definition of this constraint can be found in footnote 6, p. 12).

A short example will make the interaction between these forces clear. Imagine we posit a constraint RHYME that states that “all lines in a quatrain must rhyme,” and a constraint RHYME-COUPLET that states that the second and fourth lines of a quatrain must rhyme.² The ranking RHYME, RHYME-COUPLET >> NO-RHYME will insure that the only legal quatrain will rhyme AAAA. Imagine that we now move RHYME to the bottom of the hierarchy: RHYME-COUPLET >> NO-RHYME >> RHYME. Now the pattern XAXA is possible. Lines two and four must rhyme, whereas lines one and three cannot. In general, as more rhyming constraints are raised above NO-RHYME, a smaller set of legal outputs result. If all constraints of rhyme and meter are low-ranked, normal language is the result. As we promote these constraints above NO-RHYME, we get a continuum of increasingly restricted poetic forms: from prose to free verse to blank verse to partially rhyming verse to totally rhyming verse.

Analyzed this way, the constraints relevant to rhyme are all markedness constraints. Because faithfulness plays no role in determining rhyme schemes, some inputs can never be mapped to completely faithful outputs under any ranking (although constituent size presumably *is* governed in part by faithfulness constraints; see fn. 7, p. 18).

² For the time being, these constraints are hypothetical, used for illustration. We will see how actual constraints like these can be formulated in §3.2.

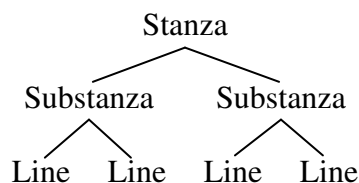
3. OT constraints

This section of the paper will establish the constraints that are responsible for determining the set of legal rhyming patterns in quatrains. The quatrain’s constituent structure as well as the reason for its status as the unmarked poetic stanza will be discussed in §3.1. In §3.2 I examine the rhyme schemes that are possible within a quatrain and motivate a set of OT constraints that determine rhyme patterns.

3.1. *Binarity and constituent structure*

I assume, following Hayes and MacEachern (1998), that a poetic stanza is parsed into the structure in (2):

(2)



Although the branching depicted here is strictly binary, this is true only in the unmarked case. Just as “degenerate” feet can occur consisting of only one syllable, non-binary constituents are tolerated in many kinds of poetry. To avoid confusion, I will use the terms *substanza* and *stanza* to refer to the abstract prosodic categories (which may or may not be binary), and use the terms *couplet* and *quatrain* to refer to unmarked occurrences of the categories in which strict binarity is observed. In this section, *stanza* will be synonymous with *quatrain* and *substanza* with *couplet*; however; see §5 for some comments on non-binary constituents.

The fact that binary constituents tend to be the default in poetry can be simply handled in OT with binarity constraints modeled on FOOT-BIN. Using the prosodic categories outlined above, we can posit the set of constraints in (3):

(3) Binarity constraints

- (a) SUBSTANZA-BIN: A stanza must consist of two lines.
- (b) STANZA-BIN: A stanza must consist of two stanzas.

In addition to these, we will need a set of parsing constraints similar to PARSE-SYLLABLE.

The constraints PARSE-LINE and PARSE-SUBSTANZA mandate that every prosodic constituent must be parsed into the next largest constituent, amounting to a ban on “extrametrical” lines. Throughout this section, it will be assumed that both binarity and parsing constraints are undominated, resulting in the structure in (2) for every quatrain.

3.2. *Rhyming constraints*

3.2.1. Poetic rhyme and constituent structure

In order to determine what constraints might be responsible for allowing certain patterns of rhyme and prohibiting others, let us first consider the nature of poetic rhyme pretheoretically. Rhyme and meter are essentially devices that draw attention to the prosodic structure of the poem. They can be seen as devices that in normal speech are restrained by the dominant needs of faithfulness—to lexical forms or syntactic structure. In poetry, however, these prosodic considerations are allowed to have free reign, excluding any output that is not prosodically perfect in some way.

Thus, a piece of poetry that “scans” will have its prosodic structure “advertised” by one or more of several poetic devices. It can easily be seen how rhyme can serve as such a device. In a simple four line poem, for example, a rhyme scheme of AABB would give the listener a strong sense that the first two (and last two) lines “belong” together as

a group, heightening the saliency of the couplet as a prosodic unit. Rhyming all (AAAA) or none (XXXX) of the lines would have the reverse effect, downplaying the saliency of the couplet.

There are two main ways that rhyme can be used to make poetic structure explicit. First, rhyming lines can be used to mark the beginnings or ends of prosodic constituents. In a quatrain that rhymes XAXA, for example, the rhyming lines indicate where each couplet ends, making the couplet structure salient to the listener. A similar effect is achieved by the AABB pattern mentioned above—in this case, both the beginning and end of each couplet is marked with rhyming lines. However, as we will see later, the beginnings and ends of constituents are not treated symmetrically.

3.2.2. Anchoring constraints

How can we formalize these intuitions using OT constraints? It seems clear that rhyme itself, like reduplication, involves constraints that require identity between elements—in the case of poetry, line ends—that are in correspondence. What is not so clear, though, is what determines these correspondence relations in the case of poetry—which lines are required to rhyme? My proposal is that, just as in reduplication, this is handled by anchoring constraints.

When applied to reduplication, anchoring constraints require that certain edgemoost segments in the base and reduplicant be in correspondence. For example, RIGHT-ANCHOR-BR requires that the rightmoost segment in the base correspond to the rightmoost segment in the reduplicant. Given that there are two edges, and the further stipulation that only like edges can be paired³, there are two possible types of anchoring

³ E.g., there can be no constraint of the form “the leftmoost segment of the base must correspond to the rightmoost segment of the reduplicant.”

constraint⁴. These are illustrated in (4), their effects shown with a hypothetical base-reduplicant pair (the reduplicant is in bold).

(4) Anchoring constraints

- (a) LEFT-ANCHOR-BR: **b₁a₂**-b₁a₂dupi
- (b) RIGHT-ANCHOR-BR: badup₁i₂-**p₁i₂**

In the case of rhyme, we can use the same constraint type, but define it as referring not to a base and a reduplicant but to adjacent prosodic constituents that are parsed into the same larger constituent—e.g., two couplets within a quatrain. The elements that are in correspondence are not segments, but entire lines. If we recast the constraints in (4) this way, relativizing them to different prosodic constituents, the results are those in (5) (substanza parsing is indicated with parentheses).

(5) Poetic anchoring constraints

- (a) LEFT-ANCHOR(substanza): (A₁X)(A₁X)
- (b) RIGHT-ANCHOR(substanza): (XA₁)(XA₁)
- (c) ANCHOR(line)⁵: (A₁A₁)(B₂B₂)

Once the appropriate correspondences are established, I assume that an IDENT constraint (the equivalent of IDENT-BR) requires that corresponding lines rhyme. Although this paper will not deal with the specific mechanism used to accomplish this, it seems clear that such a constraint must somehow target the end of the line, which is considered a strong position by the rhyming constraints. Throughout, I will assume that this identity constraints are undominated, leaving the precise pattern of rhymes up to other constraints.

My claim, then, is that anchoring constraints are the primary determiners of the inventory of rhyme schemes. They decide which lines can be allowed to rhyme with

⁴ I ignore the possibility of EDGE-ANCHOR, which refers to both edges. Whether or not a metrical equivalent to this exists is a question I hope to answer in future research.

⁵ I have omitted the directionality here, as both LEFT- and RIGHT- versions have identical effects.

which others. Ultimately, the factorial typology generated by our set of rhyming constraints should match exactly the set of attested schemes. However, the constraints in (5) are not sufficient. If these (and NO-RHYME) are the only relevant constraints, then all of the quatrain patterns in (1) will be harmonically bounded except for AAAA and XXXX. The former satisfies all rhyming constraints, violating only NO-RHYME, while the latter violates all rhyming constraints and satisfies NO-RHYME (which is violated by every other pattern). No other scheme outperforms both candidates on any constraint. Thus our constraint set so far predicts an “all-or-nothing” distribution of rhyme, at odds with the facts in (1). The next section addresses this problem.

3.2.3. RHYME-BIN

In order to allow the “perfect” candidate AAAA to be defeated under some rankings, we will need to add a constraint that it violates. My proposal (based on a suggestion from Bernard Tranel (p.c.)) stems from the observation that rhyming lines tend to occur most often in pairs. This is due to the presence of the constraint in (6), which prohibits anything but a one-to-one correspondence between lines.

(6) RHYME-BIN: A line can only rhyme with one other line in the same stanza.

This constraint reflects the intuition that rhyme works by the creation of expectation and the satisfaction of that expectation. Upon hearing one line of poetry, the listener expects to hear another that rhymes with it. Once the second rhyming line is heard, the expectation is fulfilled, and a sense of closure is achieved. Because it is superfluous to have a third rhyming line, it is natural that rhyming pairs should be unmarked compared to three- or four-line rhymes. This is captured in the RHYME-BIN constraint. I will assume

it can be multiply violated by a single candidate, with one violation mark assigned for a rhyming triple, two marks for four rhyming lines, and so on.

With RHYME-BIN added to our constraint set, it is possible to generate rhyme schemes other than AAAA. The full set of possibilities is illustrated in (7). A note about reading this chart: it is not a tableau per se but a way to show which of a set of candidates are harmonically bounded—it does not represent any specific ranking. Bounded candidates are in shaded rows, and the rightmost column gives an example of another candidate that outperforms the bounded one on every constraint.

(7) Typology after inclusion of RHYME-BIN

		R-ANC (sub)	ANC-R	ANC-line	NO- RHYME ⁶	RHYME- BIN	Bounded by
Attested	AAAA				*	**	
	ABAB			**	*		
	AABB	*	*		*		
	XAXA	*		**	*		ABAB
	XXXX	*	*	**			
	ABBA	*	*	**	*		AABB
	AXXA	*	*	**	*		AABB
	AAXA	*		*	*	*	
Unattested	AAXX		*	*	*	*	
	AAXX	*	*	*	*		AABB
	XXAA	*	*	*	*		AABB
	AXAA		*	*	*	*	
	AXAX		*	**	*		
	XAAA	*		*	*	*	
	XAAX	*	*	**	*		AABB

This is an improvement over the typology generated without RHYME-BIN, but it is still not a very good fit to the data. The next section examines how the predictions can be improved.

⁶ NO-RHYME is interpreted to require that no lines rhyme in a candidate. All candidates with any rhyming lines are treated equally, getting one violation no matter how many lines rhyme. If the constraint is interpreted to permit multiple violations, it leads to inaccurate predictions—namely, the unattested AAXX and XXAA are generated as part of the typology.

3.2.4. Asymmetry in anchoring constraints

Among other things, the chart in (7) predicts that XAXA—which is very common in traditional verse—should be as easy to generate as the extremely rare AXAX. In addition to their relative frequencies, there is a clear intuition on listening to each type of quatrain that the rhyming pattern is much more salient in the XAXA type than in the AXAX type. This applies to any poetry type in which the beginnings of adjacent constituents rhyme while the ends do not. On the basis of these observations, I argue that there exists no LEFT-ANCHOR constraint comparable to the RIGHT-ANCHOR constraint. Rhyming is fundamentally asymmetric (cf. Nelson 2002 on the absence of RIGHT-ANCHOR in prosodic morphology).

Thus we are left with RIGHT-ANCHOR (substanza) and ANCHOR(line), which, following Tranel and Wu 2001, I will rename RHYME(substanza) and RHYME(line). Their definitions are in (8).

(8) RHYME -X constraint family

- (a) RHYME (line): All lines in a stanza must rhyme.
- (b) RHYME (substanza): The last lines of every stanza in a stanza must rhyme.

With LEFT-ANCHOR gone, the typology in (9) results:

(9) Typology after removal of LEFT-ANCHOR

		RHYME (sub)	RHYME (line)	NO- RHYME	RHYME- BIN	Bounded by
Attested	AAAA			*	**	
	ABAB		**	*		
	AABB	*		*		
	XAXA		**	*		
	XXXX	*	**			
	ABBA	*	**	*		AABB
	AXXA	*	**	*		AABB
	AAXA		*	*	*	
Unattested	AAAX	*	*	*	*	AAXA
	AAXX	*	*	*		AABB
	XXAA	*	*	*		AABB
	AXAA	*	*	*	*	AAXA
	AXAX	*	**	*		AABB
	XAAA		*	*	*	
	XAAAX	*	**	*		AABB

All that remains is to allow ABBA and AXXA in, and exclude XAAA. A single constraint will accomplish this:

(10) RHYME-EDGES(stanza): The first and last lines of a stanza must rhyme.

This constraint requires correspondence between elements within a single constituent, rather than elements in matching positions across constituents. This fits our intuition that an “enclosed” quatrain like ABBA (often called “envelope rhyme”) is more self-contained than one that rhymes ABAB. The entire stanza is made salient to the listener by marking both its beginning and end.

As chart (11) shows, the addition of this constraint allows our factorial typology to match the facts.

(11) Typology after addition of RHYME-EDGES

		RHYME (sub)	RHYME (line)	NO- RHYME	RHYME- BIN	RHYME- EDGES	Bounded by
Attested	AAAA			*	**		
	ABAB		**	*		*	
	AABB	*		*		*	
	XAXA		**	*		*	
	XXXX	*	**			*	
	ABBA	*	**	*			
	AAXA	*	**	*			
Unattested	AAXX	*	*	*	*	*	AAXA
	AAXX	*	*	*		*	AABB
	XXAA	*	*	*		*	AABB
	AXAA	*	*	*	*		AAXA
	AXAX	*	**	*		*	AABB
	XAAA		*	*	*	*	AAXA
	XAAx	*	**	*		*	AABB

3.2.4. RHYME

Although the constraints described so far generate the correct typology, one small infelicity remains. Some pairs of candidates in (11) are indistinguishable by the grammar—for example, ABAB and XAXA, or ABBA and AXXA (NO-RHYME cannot tell them apart, due to the way it is interpreted). This means that if any one of these forms is used as an input, it will be mapped to two different outputs, each equally optimal.

Although it is not clear exactly what this would mean regarding the grammaticality of such forms, it seems preferable to have each input mapped to a unique output. In order to distinguish between partially and totally rhyming poetry, the constraint in (12) is needed (cf. Tranel and Wu 2001).

(12) RHYME: A line must rhyme with another line in the same stanza.

This will be violated once for each “X” line in a candidate, and when appropriately ranked can choose between ABAB and XAXA.

3.2.5. Summary of rhyming constraints

Listed in (13) is the complete set of rhyming constraints I argue are active in determining possible quatrain rhyme schemes.

(13) Rhyming constraints

Binarity

- (a) SUBSTANZA-BIN: A stanza must consist of two lines.
- (b) STANZA-BIN: A stanza must consist of two stanzas.

Parsing

- (c) PARSE-LINE: Every line is parsed into a stanza.
- (d) PARSE-SUBSTANZA: Every stanza is parsed into a stanza.

Anchoring

- (e) RHYME(line): All lines in a stanza must rhyme.
- (f) RHYME(substanza): The last lines of every stanza in a stanza must rhyme.
- (g) RHYME-EDGES(stanza): The first and last lines of a stanza must rhyme.

Other

- (h) RHYME-BIN: A line can only rhyme with one other line in the same stanza.
- (i) RHYME: A line must rhyme with another line in the same stanza.
- (j) NO-RHYME: No lines may rhyme.

In the case of quatrains, the structural constraints in (a-d) are undominated, restricting the possible outputs to four-line units with binary constituency. The rhyming constraints in (e-j) may be freely reranked to produce different poetic grammars, resulting in the observed range of rhyme schemes used with quatrains. Different poetic genres can be described as specific rankings (or sets of rankings) of these constraints.

4. Possible counterexamples

I noted earlier that the set of constraints I have proposed excludes quatrains that rhyme AXAX. There are at least two types of poetry that could be said to exhibit this pattern. The first comes from English, and is a scheme sometimes used in the ballad, a

traditional form of poetry that consists of a series of quatrains. One possible quatrain pattern is shown in (25); an example of such a poem is given in (26), with the refrains in bold.

(14) Ballad quatrain: aBaC dBdC

(15) Example ballad

She went down below the thorn
Fine flowers in the valley
 And there has she her sweet babe born
And the green leaves they grow rarely

She's ta'en out her little penknife
Fine flowers in the valley
 And there she's twinned her sweet babe of it's life
And the green leaves they grow rarely

Although this is sometimes described as an AXAX pattern, it is clearly different. This type of ballad always uses refrains in the second and fourth lines, in contrast to XAXA type ballad quatrains, in which no refrain is necessary. A pattern like that in (25) can be explained by the presence of the RHYME constraint in the grammar forcing lines one and three to rhyme. The fact that these lines cannot rhyme unless refrains occupy lines two and four is further evidence that lines one and three cannot be explicitly targeted by rhyming constraints.

Another supposedly unattested scheme, AAAX, can be found in the Hebrew Purim. However, like the previous examples, this is not a true example of an unrhymed last line, as the fourth line always ends in the same word, *purim*. Thus the pattern is more accurately represented as in (16).

(16) Purim: AAAB CCCB DDDDB...

Many apparent counterexamples cease to be counterexamples once correspondences across stanzas are taken into account. A single stanza taken out of a poem may appear to exhibit, say, an AXAX pattern, but when the context is examined it becomes clear that the “X” lines actually rhyme with lines in other stanzas. This can be seen as the influence of high-ranking constraints that require cross-stanza correspondences.

These examples show that the space of possible rhyme schemes explodes when stanzas are connected to form larger structures, and the interactions between stanzas is taken into account. This is clearly a fruitful area for further research.

5. Tercets

In the account of quatrain structure above, the fact that binarity and parsing constraints are undominated was taken for granted. Since they are violable constraints, however, it is reasonable to assume that they are sometimes violated. This section briefly discusses how three-line stanzas can be handled by the grammar, and what rhyme schemes are predicted to occur.⁷

Behind quatrains, tercets are the most popular stanza type in English verse. There are five possible ways to rhyme a tercet, listed in (17):

(17) Tercet rhyme schemes:

XXX
XAA
AAX
AXA
AAA

⁷ I do not address the question of how and when the binarity constraints may be violated, but I assume that there are faithfulness constraints that ensure that a three-line input can be mapped to a three-line output.

However, only three patterns are at all common: XXX, AXA, and AAA. The question, as with quatrains, is: why these patterns?

It is clear how the attested schemes can be generated by the same constraints used for quatrains. XXX results when NO-RHYME is undominated. AXA is grammatical with the ranking RHYME-EDGES >> NO-RHYME >> RHYME. AAA is possible when RHYME dominates RHYME-BIN. The set of metrical constraints I have proposed correctly predicts that these are all possible rhyme schemes in tercets.

The unattested patterns are somewhat more problematic. The chart in (18) shows why (parentheses indicate *substanza* parsing⁸).

(18) Tercet rhyme scheme typology

	RHYME	RHYME-LINE	RHYME-SUB	RHYME-BIN	RHYME-EDGES	NO-RHYME	Bounded by
(X)(XX)	***	*	*		*		
(A)(AX)	*	*	*		*	*	XAA
(X)(AA)	*		*		*	*	
(A)(XA)	*	*				*	
(A)(AA)				*		*	

Although AAX is correctly eliminated, XAA is predicted to be optimal under some rankings. How can it be eliminated?

Although I do not have a formal solution to this problem yet, my intuition is that XAA is less desirable than the other schemes because of a lack of parallelism. Earlier it was argued that rhyme serves to mark the boundaries of constituents. In the pattern (X)(AA), the two rhyming lines mark the beginning and end of the second *substanza*, but the first *substanza* is not marked by rhyme. In fact, there is no way to make the *substanzas* more salient in a tercet—the best that can be done is to either make the entire

⁸ I assume that the single-line *substanza* is initial in the tercet, based on the LONG-LAST constraint proposed by Hayes and MacEachern (1998). Allowing different parsings, however, does not affect the rhyming typology.

stanza salient by rhyming the edges (AXA and AAA), or avoid rhyme altogether (XXX). If constituent saliency requires parallelism across adjacent constituents, then the unattested AAX and XXA are ruled out. The precise formalization of this parallelism requirement is an issue that is beyond the scope of the present paper, but one to which I hope to return.

6. Conclusion

In this paper I have made the following claims:

- Metrical form is the result of a set of ranked, violable constraints.
- Metrical constraints occupy the same hierarchy used to generate regular speech; there is no special poetry-only module or component.
- Metrical constraints are modifications of standard prosodic constraints; the only difference is in the prosodic units referred to by the constraint.
- Metrical well-formedness is determined by an inventory grammar, in which grammatical forms are those which the grammar maps to an identical output.

As evidence for these conclusions I presented data from rhyming quatrains in English poetry, and showed that a set of anchoring and identity constraints properly predicted the set of attested patterns.

I believe that this account of poetic language is superior to others that have been advanced, because it is both simpler—there are no multiple modules—and more restricted—metrical constraints must be derived from standard OT constraints. Whether this approach can be successfully extended to all forms of poetic language remains to be seen, but if it can, it promises to answer deep questions about the relation between ordinary language and poetry.

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