32nd Harvard Celtic Colloquium
October 5, 2012

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Aspects of Old and Middle Irish Rhyme[1]

Introduction

- Why look at rhyme?
  Linguists are interested in rhyme for the information it provides about phonological similarity. Similarity is relevant to a wide variety of synchronic phonological processes in language as well as to language change.
- Why Early Irish rhyme?
  Only imperfect or "half-" rhyme can provide information about similarity, and even apparently free rhyming systems have a degree of similarity in them. (e.g. Kawahara (2007) for Japanese rap.) Early Irish rhyme has clear rules for matching consonants, but also shows a great deal of freedom in rhyme. The question is: what kind of phonological similarity do the rules represent?

1 Early Irish Rhyme

- I use the first 150 cantos of *Saltair na Rann* (*SnR*) as a corpus. Though this is technically Middle Irish, my observations should hold true (with minor adjustments) for Old Irish and perhaps Classical Modern Irish rhyme as well.
- This gives 7,788 lines, or 3,894 rhyming pairs, taken from the online CELT[2] edition, corrected where necessary to Greene's[3] edited version (for word-division, hiatus, etc.).
- How Early Irish rhyme works (Murphy 1961:32):
  - Vowels must match.
  - Consonants are divided into classes, within which any two segments may rhyme.

(1)
- Class P: Voiceless stops: [p, t, k]
- Class B: Voiced stops: [b, d, g]
- Class F: Voiceless fricatives: [f, θ, x]
- Class S: Sibilant: [s]
- Class β: Voiced fricatives (β): [β, ð, ɣ] + singleton sonorants (N): [l, r, n, ṽ]
- Class NN: Geminate sonorants:[lː, rː, nː, m, ŋː]

Underline: final rhyme, Italics: internal rhyme, Subscript dot: alliteration (*SnR*:1-4)

mə 'rʲiːsʲə 'rʲiː 'nʲiṽʲə 'naːⁱrʲ	Mo rí-se rí ṇime ṇ<u>áir</u>	My king, the king of pure heaven
kʲen 'uːᵊβur kʲen 'imːarβa<u>ːⁱɣʲ</u>	cen úa*bur*, cen ṁmarb<u>áig</u>,	without vainglory, without strife
də 'roːsat 'doṽun 'd<u>uːᵊlax</u>	do-rósat ḍo*mun* ḍ<u>úalach</u>	created the ordained (?) world
mə 'rʲiː 'bʲiθʲbʲₑoː 'bʲiθʲb<u>uːᵊðax</u>	mo rí ḅithbeó ḅithb<u>úadach</u>	my king ever-living, ever-victorious

(Greene, 1981)(IPA and any errors therein are mine)

1 I am grateful to Mona Jakob (NUI Galway) for sharing her database of imperfect rhymes in *SnR,* and to Donca Steriade, Edward Flemming, Adam Albright and audiences at MIT, Harvard University, and Strathclyde University for helpful discussions of this work. All errors are my own.

2 http://www.ucc.ie/celt/published/G202001/

3 http://www.dias.ie/images/stories/celtics/pubs/saltairnarann/

- What the divisions in (1) show us is that place of articulation doesn't matter for similarity (labial, alveolar/dental, and velar consonants are all together) but manner of articulation does. (Stops, fricatives, sonorants each have their own classes.)
- I propose that sonority was the relevant dimension of similarity.
- What is sonority?
  The sonority hierarchy is a ranking of sounds based on their relative amplitude:

(2)
7. Vowels	(high sonority)
6. Glides/Rhotics/Laterals	
5. Nasals	
4. Voiced fricatives	
3. Voiceless fricatives	
2. Voiced stops	
1. Voiceless stops	(low sonority)

- Sonority is frequently referenced in syllable structure. For many languages, a possible maximal syllable involves a rise in sonority from onset to vowel, and a fall in the coda.
  - 'plant', with sonority levels of 1-6-7-5-1 is a good syllable, but 'npatl' (5-1-7-1-6) is not.
  - As in Irish rhyme, /s/ is an exception, because 'splant' is a possible English syllable, despite the initial fall in sonority (3-1-6-7-5-1).

- Imperfect Irish rhyme (occuring outside of the defined classes) suggests sonority is the relevant dimension of similarity:

(3) a. [Class P] ↔ [Class B] ↮ [Class F] ↔ [Class β] ↔ [Class N]
b. [voiceless stops] [voiced stops] [voiceless fricatives] [voiced fricatives] [nasals | laterals | /r/]

- Consonants can rhyme into a neighboring class, as arranged by sonority.
- Based on evidence from imperfect rhyme, I split Class β as defined in (1) into two parts.
  - Voiceless fricatives will rhyme with voiced fricatives, but not with singleton sonorants.
- What's not covered by sonority:
  - [s] has its own class because it is a sibilant – the higher frequency of the strident energy prevents it from being considered similar to other fricatives.
  - The geminate sonorants are dissimilar to the singletons because of their length.[4]
  - Consonants are supposed to match for palatalization in rhyme too – this won't affect sonority, and I consider it part of the requirement that vowels match. If the vowel in one line of a couplet has a glide onto a palatalized consonant, the vowel in the other line must match this.

4 There is some disagreement over the actual pronunciation of the orthographic geminate sonorants in Old Irish. I interpret them as phonologically geminate because they are historically derived from geminates (or assimilated nasal+stop clusters) and the contrast is neutralized after long vowels. (Thurneysen 1949:38, Greene 1952:218)

2 Sonority Contours & Cluster Rhyme

- Similar levels of sonority in segments can explain the VC rhymes, but not VCC.
- Clusters could be rhymed perfectly (4a), with skipping (4b), or mismatching (4c):

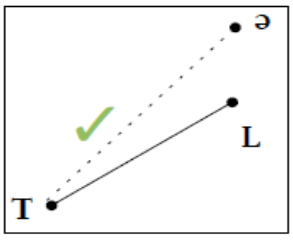
(4)	a. clecht ~ imthecht	/ɛxt ~ ɛxt/	(*Saltair na Rann*: 93-94)
	b. cacht ~ námat	/axt ~ at/	(4035-4036)
	c. tlacht ~ comnart	/axt ~ art/	(15-16)

- Rhyme domains which allow skipping segments occur only sparsely in poetry, and in rock lyrics Zwicky (1976:683) notes that only 3.1% of rhymes involving skipping a segment will skip an internal segment (e.g. "proud-ground") rather than one on the edge ("pass-fast"). The frequency of this option in Irish makes sense if we compare the overall sonority contour rather than each segment.

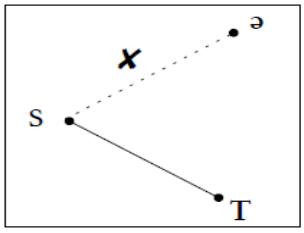
2.1 Other evidence for similarity in sonority contours

- Perceptual similarity of sonority contours has been explored as an explanation for the cross-linguistic patterns of epenthesis in initial consonant clusters (Flemming 2008, Steriade 2006).
- Epenthesis is a more likely repair of C_1C_2 when there is a steep rise in sonority between C_1 and C_2 because that steep rise is more similar to the one between C_1 and an epenthetic vowel.

(5)
a.



b.



- For example, if we wanted to borrow the Irish word *dlí* into English, we would probably pronounce it as /dəli:/ and not /ədli:/.
- However, when Welsh decided to repair initial *sT-* clusters, it changed Latin *scōla* into *ysgol*, rather than **sygol*.
- Either repair would solve the problem of the cluster, but the option which preserves a similar sonority contour is chosen.

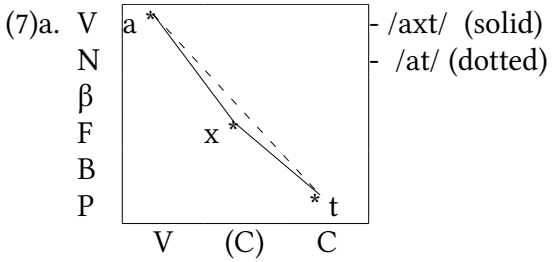
- In Skaldic poetry, mismatch is allowed at the end of a rhyme as long as both rhyme domains include a final rise in sonority. (Árnason, 1991) Here, the glides [j, w] and [r] may rhyme as part of a rising cluster:

(6) meina n[iðr] í m[iðj]an (Þórsdrápa 17:7)

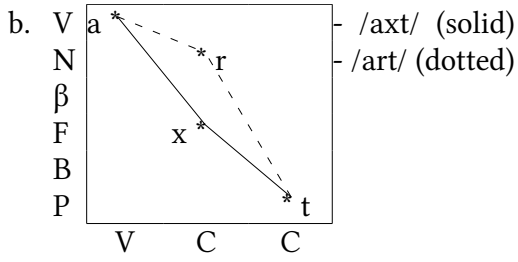
2.2 Sonority contours in Irish rhyme

- Instead of thinking about Irish rhyme as a correspondence between individual segments of the rhyme domain, we can think of it as similarity in the rises and falls in sonority across the rhyme.
  - I suspect this is what Ó Cuív (1966) was getting at when he wrote about "prosodies" of Classical Modern consonant cluster rhyme.
- In Irish rhyme, each possible cluster rhyme includes a fall in sonority from the vowel to the final consonant; they just have slightly different mid-points:

(7)a.



b.



- We want to be able to measure the difference between rhymes in (7a) and (7b).

3 Quantifying sonority contours

- To analyze sonority, linguists assign numbers to each level of the sonority hierarchy.
- Changes in sonority can be compared with a ratio between the beginning and end points.

- For Irish we need numbers that will allow a close match between voiced fricatives [β,ð,ɣ] and sonorants [n,l,r,ṽ], because they function as a single class.
- We also need a wide gap between the stops [p,t,k,b,d,g] and voiceless fricatives [f,x,θ] because even in imperfect rhyme, they are not paired.
- These goals are attainable if we make certain assumptions about the phonetic details of Early Irish pronunciation.
- Looking at studies of the phonetic correlates of sonority (Parker 2002, 2008) we can make Early Irish look like a possible language if we assume the voicing distinction was one of aspiration rather than true voicing, and that the voiced fricatives were realized as approximants (with less constriction, and higher sonority), as in Spanish.
  - This means that Early Irish /p,t,k/ were realized as [p^h, t^h, k^h] even in final and intervocalic positions. /b,d,g/ were realized as [p,t,k]. This (more or less) matches the pronunciations in Modern Irish, Scottish Gaelic and Manx, and means it's not necessary to look for influence from (e.g.) Norse for the aspiration in the modern languages.
    - The voiceless series of stops will be more sonorous than the voiced, so if rhymes between stops and voiceless fricatives do occur, I would expect them to be between Class P and Class F.

3.1 Distances in sonority contours for VC rhyme

- The details of the numbers and ratios can be found in Appendix I.
- A lower number means a more similar pair: 0.0 is an exact match for sonority.
- Distances between VC-VC rhymes are in the table in Fig. 1.
- The classes in the rows represent the final segment from one line of a couplet, and the columns show the final segment from the other line:

	V	N	β	F	P	B
V	0	1	1	1	1	1
N		0	0.2	0.5	0.8	0.8
β			0	0.3	0.7	0.7
F				0	0.5	0.6
P					0	0.1
B						0

Fig. 1: Sonority distance values in VC pairs.

- Empty, dark grey boxes are redundant values and light grey boxes are distances that Early Irish poets seem to judge to be too dissimilar to rhyme.
- Values in the white boxes include both perfect Irish rhymes and cross-category rhymes that seem to be considered close enough to rhyme frequently.
- Using these numbers, we can say that any rhyme with a distance of 0.5 or greater is an unacceptable rhyme.

	V	N	β	F	P	B
V	633	0	0	0	0	0
N		1194[5]	460[6]	45[7]	0	0
β			450	283	0	0
F				451[8]	0	0
P					2[9]	10
B						51

Fig. 2: Attested numbers of VC pairs in *SnR*.

- With the exception of the 45 [F]~[N] rhymes, this analysis explains the attested imperfect VC rhymes.

5 This number includes any pair in which both rhyming words end in a sonorant – either geminate or singleton. Of these pairs 858 are both singletons, 196 are both geminates, and 140 are a geminate rhyming with a singleton.

6 Of these, 29 are β~NN, and 431 are β~N.

7 This number includes 41 F~N, and 4 F~NN.

8 This includes 207 pairs which are of class [F] (/f, x, θ/) as well as 244 [S] class rhymes.

9 Due to the inconsistent orthography of Early Irish stops, these numbers are not likely to be perfectly accurate.

3.2 Extending the analysis to VCC and bisyllabic rhyme

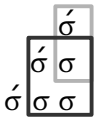
- The same process of creating ratios can be used to measure longer rhyme domains.
- The counts and distances for the types of cluster rhymes in *SnR* are as follows:

(8)

Distance:	0.0	0.1	0.2	0.3	0.4	0.5	0.6
Examples:	Perfect: 126 XT~T 44 RN~N: 10 RS~S 3 FT~T 1	RG~NT 5	Ø	RT~T 33 LT~T 7	XT~RT 42 FT~RT 32 XT~LT 7 FT~LT 1	RB~RM 1 LB~RM 1 ST~S 1	ðβ~rβ 1
Attestations:	184	5	0	40	82	3	1

- However, in every case, the final consonant will match (by imperfect standards) for sonority levels, so what's to stop us from saying that the rhyme only cares about the vowel and the final consonant, besides this pattern being very rare?
- *SnR* is written in the *debide* meter, so rhymes of one or two syllables are possible[10]:

(9)



- The internal cluster in bisyllabic rhymes show it's not the case that only vowels and final consonants matter.
- Of 432 bisyllabic rhyming pairs, only 58 are imperfect, by Irish standards (including cross-class rhymes and skipping consonants).
- If only the final consonant mattered, we might expect much higher numbers of imperfect pairs. Instead, the sonority levels of the consonants stay close throughout the rhyme domain.
- The distance values for all of the bisyllabic rhymes in my corpus are below in (10). Here too, 0.5 looks like the cut-off for acceptable rhymes:

(10)

0.0	0.1	0.2	0.3	0.4	0.5	0.6
367 perfect 5 imperfect	12	14	12	14	3	2

- The bisyllabic rhymes show that in order to be considered similar, a rhyming pair had to maintain similar levels of sonority throughout the rhyme domain, in both the fall(s) and rise(s).

10 The acute accent indicates the location of stress.

4 Was a perfect match avoided?

- A question that frequently comes up in studies of Irish rhyme is whether an exact match between consonants was avoided.
- Tristram (1995:454) mentions that "the principle of near-sameness entails a tendency to avoid sameness among all of the consonants, with the significant exception of /s/".
- However, Sproule (1987:195) finds "as many as four out of ten rhyming words with identical consonants in some poems, so the practice was obviously not proscribed, though it may have been regarded as bad taste."
- Plaster (2008) finds similar results, with 39% identical rhyme in his corpus.
- *Saltair na Rann* also shows about 40% of one syllable rhymes being identical.
- However, none of this tells us anything without a base to compare it to.

- Within-class rhyme: Observed perfect vs. imperfect matches, compared to a randomized pairing of the same rhyming words.

~~	Observed	Expected
t ~ t	0	0
t ~ p, k	0	0

~~	Observed	Expected
p ~ p	0	0
p ~ t, k	0	0

p = 0.55	Observed	Expected
k ~ k	2	1.7
k ~ t, p	0	0.3

~~	Observed	Expected
b ~ b	0	0
b ~ d, g	1	1

p = 0.83	Observed	Expected
d ~ d	29	29.6
d ~ b, g	11	10.4

p = 0.09	Observed	Expected
g ~ g	4	2
g ~ d, b	4	6

~~	Observed	Expected
f ~ f	0	0
f ~ θ, x	1	1

p < 0.0001	Observed	Expected
θ ~ θ	55	78.8
θ ~ f, x	(70)	46.2

p < 0.0001	Observed	Expected
x ~ x	(53)	21.1
x ~ θ, f	10	41.9

p < 0.0001	Observed	Expected
β ~ β	(43)	17.3
β ~ ɣ, ð	13	38.7

p < 0.0001	Observed	Expected
ð ~ ð	(66)	35.8
ð ~ β, ɣ	23	53.2

p < 0.0001	Observed	Expected
ɣ ~ ɣ	(81)	55.9
ɣ ~ ð, β	119	144.1

p < 0.0001	Observed	Expected
n ~ n	233	171.6
n ~ l, r, m	158	219.4

p < 0.0001	Observed	Expected
l ~ l	108	61.3
l ~ r, n, m	101	147.7

p < 0.0001	Observed	Expected
r ~ r	84	48.8
r ~ l, n, m	108	143.2

~~	Observed	Expected
m ~ m	0	0
m ~ n, l, r	0	0

p < 0.0001	Observed	Expected
nn ~ nn	79	46.1
nn ~ ll, rr, mb, ng	46	78.9

p = 0.94	Observed	Expected
ll ~ ll	2	1.9
ll ~ nn, rr, mb, ng	19	19.1

~~	Observed	Expected
rr ~ rr	0	0
rr ~ ll, nn, mb, ng	0	0

p < 0.0001	Observed	Expected
mb ~ mb	21	11.6
mb ~ ng, ll, rr, nn	3	12.4

p = 0.60	Observed	Expected
ng ~ ng	2	1.4
ng ~ mb, nn, ll, rr	22	22.6

- There is a statistically significant preference for exact matches in rhyme for [x,β,ɣ,ð,n,l,r,m,n:], a preference for avoiding an exact match for [θ], and results that resemble random selection for the rest.
- I plan to run similar tests for the cluster rhymes and cross-category rhymes to answer this question more definitely.

5 Conclusion

I believe that the relevant dimension of similarity in Early Irish rhyme was sonority, and more specifically, it was the change in sonority across the rhyme domain. This is quantifiable if we make certain assumptions about the pronunciation of Irish at the time, namely that voiceless stops were aspirated, and that voiced fricatives were actually approximants. This analysis can carry over from the simple VC rhymes, which other analyses have focused on, to cover VCC and bisyllabic rhyme as well.

I have also shown that despite the freedom of this rhyming system, there was no effort made to avoid exact matches in rhyme, moreover, there was an attempt to have a perfect match where possible, at least for the *Saltair na Rann* poet.

Appendix I

Numbers assigned to each level of the sonority hierarchy (value), with the fall from a vowel:

(11)

Class	Value	Fall
V [a(:), i(:), u(:), e(:), o(:)]	8	0
N [l, r, n, ṽ], [l:, r:, n:, m:, ŋ:]	6.5	1.5
β [β, ð, ɣ]	6	2
F [f, θ, x], [s]	5	3
P [p, t, k]	2	6
B [b, d, g]	1	7

- Using the numbers in (11) and the approach for creating ratios between two points in the sonority profile, we can calculate the distance between two sonority falls by subtracting the value of the final consonant from 8, the value of a vowel.
- A ratio between two falls can be calculated by dividing the smaller number by the larger and the perceptual distance between them can be found by subtracting that ratio from 1.
- Rhymes between consonants from the same class will have a ratio of 1, and therefore a distance of 0.

Creating a ratio for VC rhymes:

- To give an example of how the ratios work, consider the imperfect rhyme pair [eð]~[eθ].
- The vowel in both cases is assigned a value of 8. ð = 6, and θ = 5. Because there is a greater fall in [eθ], it will have a steeper slope than [eð]. The ratio of these can be calculated as in (12):

(12) $1 - ((8-6) \div (8-5)) = 0.3$

- Values for every VC-VC combination are in Fig.1, above.

. **Analyzing VCC rhymes**

- Calculating distances between VCC pairs, is the same as for VC rhymes, but with an added step.
- The ratios between each pair of segments is compared, and the difference is averaged over the rhyme domain.

(13)

value	8	6.5	2	8	5	2	$(1 - (1.5/3)) + (1 - (3/4.5)) \div 2 =$ <u>0.4</u>
class	V	N	P	V	F	P	
fall		1.5	4.5		3	3	

- To analyze a rhyme that involves skipping a segment, I add a "dummy" mid-point to allow the change in sonority to be compared in two parts, instead of one.

(14)	value	8	5	2	8	6	2	$(1 - (2/3)) + (1 - (3/4)) \div 2 = \underline{0.3}$
	class	V	-	P	V	N	P	
	fall	3		3	2		4	

- A consequence of the mid-point and these numbers is that sometimes rhymes with skipped segments can come out as perfect, as in (15):

(15)	value	8	5	2	8	5	2	$(1 - (3/3)) + (1 - (3/3)) \div 2 = \underline{0.0}$
	class	V	-	P	V	F	P	
	fall	3		3	3		3	

Bisyllabic rhyme:

(16) shows a mismatched pair with a difference in sonority too large for a simple VC rhyme.

(16)a. do-f<u>órgaib</u> /'oːryaⁱβʲ/ (*SnR* 2131-2132)
forórdaib /oːrdaⁱβʲ/

This can be analyzed in the same way as the shorter clusters in (13) and (14).

(17) a.	value	8	6.5	6	8	6	8	6.5	1	8	6
	class	V_1	N	β_1	V_2	β_2	V_1	N	B	V_2	β_2
	change		1.5	0.5	2	2		1.5	5.5	7	2

b. $(1 - (1.5/1.5)) + (1 - (0.5/5.5)) + (1 - (2/7)) + (1 - (2/2)) \div 4 = \underline{0.4}$

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