Class 9: Singing and the Two vs. Three Level Question

1. Readings and assignments

- Continue to talk with us.
  - Read Hayes, "Textsetting as constraint conflict", on course web page

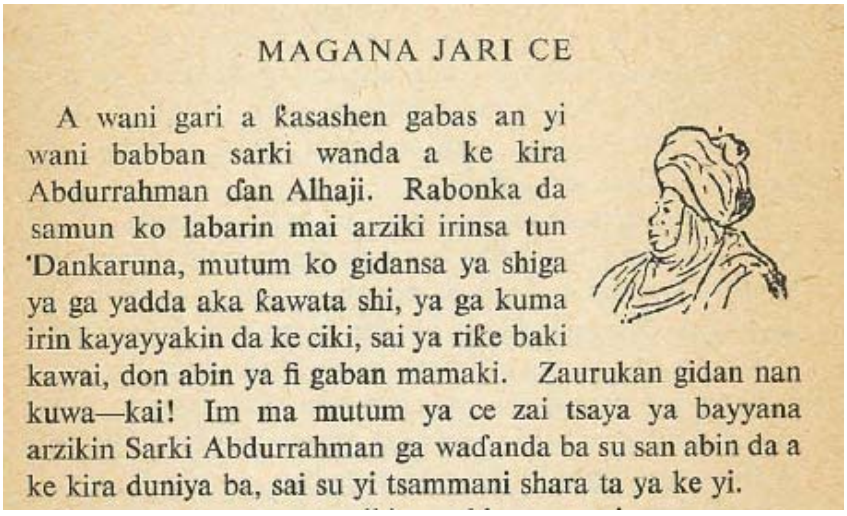
A BRIEF METHODOLOGICAL INTERLUDE: ESTABLISHING THE RAJAZ BRIDGE WITH THE RUSSIAN METHOD AND THE CHI-SQUARE TEST

2. The question at hand

- Many Hausa poems have strikingly few word boundaries between the last two syllables — perhaps a "final foot bridge".
  - Cf. Finnish *Kalevala* meter,[1] Serbo-Croatian decasyllable
- Russ had asked: what if Hausa syntax and lexicon naturally conspire to favor this pattern?

3. Applying the Russian method

- Russ grabbed some appropriate Hausa prose.



MAGANA JARI CE

A wani gari a ƙasashen gabas an yi wani babban sarki wanda a ke kira Abdurrahman ɗan Alhaji. Rabonka da samun ko labarin mai arziki irinsa tun 'Dankaruna, mutum ko gidansa ya shiga ya ga yadda aka ƙawata shi, ya ga kuma irin kayayyakin da ke ciki, sai ya rika baki kawai, don abin ya fi gaban mamaki. Zaurukan gidan nan kuwa—kai! Im ma mutum ya ce zai tsaya ya bayyana arzikin Sarki Abdurrahman ga waɗanda ba su san abin da a ke kira duniya ba, sai su yi tsammani shara ta ya ke yi.

- He coded the break between a set of two-syllable sequences placed before punctuation

[1] Kiparsky, Paul (1968) "Metrics and morphophonemics in the *Kalevala*," in Charles Gribble, (ed.), *Studies Presented to Roman Jakobson by his Students*. Cambridge, MA: Slavica, 1967. http://www.linguistics.ucla.edu/people/hayes/251metrics/papers/Kiparsky1968Kalevala.pdf

- 1 (same simplex word)

  dxan Alhaji.
  Dxankaruna,
  da ke ciki,
  rikxe baki kawai,
  gaban mamaki.

- 2 (enclitic grammatical word)

  kxawataa shi,
  duniya ba,
  gare shi,
  kawo shi ba,

- 3 (separate full content word)

  kura—kai!
  ya ke yi.
  ba shi da waa.
  ya ba ya ci.
  abin da ya ke so.

4. Counting them up

1	75
2	18
3+	7
total	100

5. Comparison verse corpus: the final bridge in Tutocin Shehu (rajaz)

1	360
2	15
3+	2
total	377

6. A simple way to test this situation

- For simplicity, glom together the 2 and 3+ categories and juxtapose the two cases.

	Tutocin Shehu	prose sample
1	360	75
2+	17	25

- Now we have a 2 x 2 array — called a **contingency table** — to which we can apply the *chi square* test to get a p-value.
- I have set up a bit of Excel stuff to do this, which you can download from the course web site. (just copy the cells to the right of your 2 x 2 array; it will display p)
- Result:

	Verse	Prose	**Expected 1**	**Exp. 2**	**Exp. 3**	**Exp. 4**	**Chi-square**	**p**	**Legit?**
1	360	75	**343.80**	**91.195**	**33.195**	**8.805**	**41.327**	**1.29E-10**	**ok**
2+	17	25							

- A better test (not used much in the past due to high computational requirements) is **Fisher's exact test**, which you can run at this web site: http://www.socscistatistics.com/tests/fisher/default2.aspx. Same result (highly significant).

7. Backup procedure

- Recall that Bruce's maxentification of the junctures in Tutocin Shehu found a positive weight for the bridge constraint, which passed the likelihood ratio test.

8. Two conceptually different tests; same conclusion

- Maxent cum GEN: final two syllables of the line are 'bridgy' when compared with an **artificial population** in which juncture distribution is totally random.
- Russian method: final two syllables of the line are 'bridgy' when compared with a **representative sample of the language** as a whole.
- For a paper (slides only) finding and pondering the *differences* between maxent-cum-GEN and Russian method, see my http://www.linguistics.ucla.edu/people/hayes/Papers/HayesM90TalkHandout.pdf; you can watch me give the talk on YouTube! https://www.youtube.com/watch?v=IRRyxW6xPeg

SUNG AND CHANTED VERSE

9. Singing/chanting is probably the norm for poetry

- I would be intrigued to find a spoken verse form that had not arisen among literate people.
- … for that matter, if you listen to Yeats, T. S. Eliot, Dylan Thomas, Robert Frost, Marianne Moore, on YouTube, they do tend toward singing, intonationally.

10. English singing/chanting: the grid has more positions than are ever filled

… at least superficially

11. Transcription is a quasi-musical skill

- I recommend finding the strongest beats first, then working down.
- For difficult genres like rap this is a colossally difficult skill; traditional folk songs aren't as hard.
- Examples for your practice (I will chant them for you).
  - Do these in pencil, since I might try some variants.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		x				x				x				x	
x		x		x		x		x		x		x		x	
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

As I looked over the cas- tle wall

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		x				x				x				x	
x		x		x		x		x		x		x		x	
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

A- mong the leaves so green, O.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		x				x				x				x	
x		x		x		x		x		x		x		x	
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

One May mor- ning so ear- ly

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		x				x				x				x	
x		x		x		x		x		x		x		x	
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Low so low and so lone- ly

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		x				x				x				x	
x		x		x		x		x		x		x		x	
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

To	take	an	English	frigate	neat	and	handy	O

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		x				x				x				x	
x		x		x		x		x		x		x		x	
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

I	wooed	her	in	the	sum-	mer	time

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		x				x				x				x	
x		x		x		x		x		x		x		x	
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

THE TWO- VS. THREE LEVEL PROBLEM

12. The levels

- I: The phonological string (not controversial)
- III: The sung material, gridded with a (roughly) isochronous Lerdahl-Jackendoff grid.
- II: The phonological material treated as meter
  - Here, the grid is a theoretical entity, meant to make sense of the legal properties of lines.

13. History (from my point of view)

- Hayes and MacEachern (1998, *Language*) lay out claimed laws concerning the distribution of empty grid slots at the ends of lines in English folk song quatrains.
- Kiparsky (2005, 2006)[2] suggests their analysis is too complex: if you first analyze the poems as being in (e.g.) iambic tetrameter, then put them to music, things are simpler.

14. Overview: How are three levels justified?

- **Blatant startovers**
  - II yields a text, whose regularities are the product of Grammar II.
  - The text is treated de novo at III, simply as phonological material.
  - I.e. the *linkage to the grid at II* is ignored.

---

[2] Kiparsky, Paul (2006) "A modular metrics for folk verse," in B. Elan Dresher and Nila Friedberg, *Formal Approaches to Poetry: Recent Developments in Metrics.*

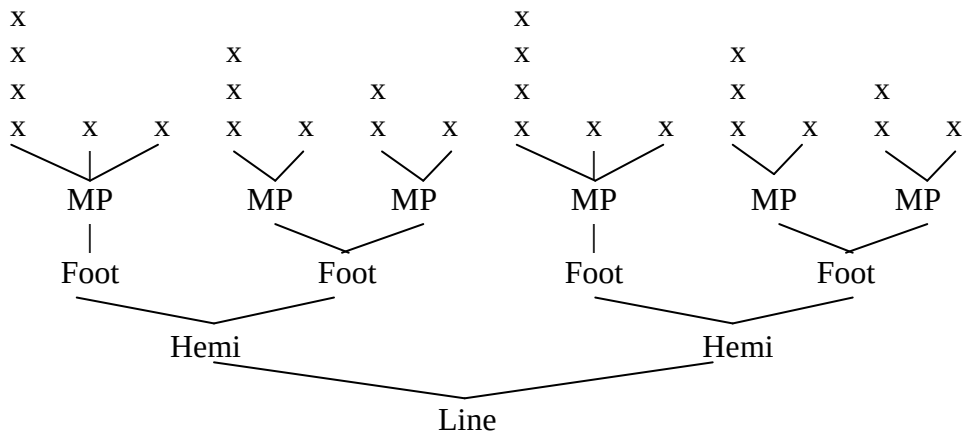
Kiparsky, Paul (2005) (but probably written after Kiparsky 2006) "Where Stochastic OT fails: a discrete model of metrical variation," Berkeley Linguistics Society proceedings, 2005.

Both on line at an old site: http://www.linguistics.ucla.edu/people/hayes/251metrics/

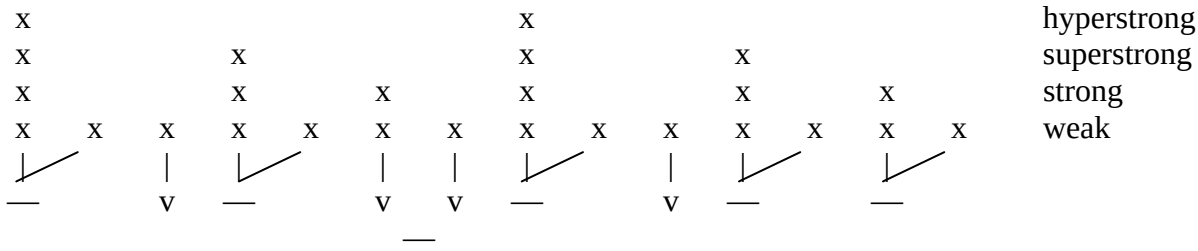
- **Remote influence** — III has its own rules, but there are subtle influences of II; you must know the linkage to the grid at II in order to calculate III.
- **It just doesn't matter:** the calculations of III and II can both proceed from phonology and are essentially identical (if all cases were like this, we could have a pure two-level theory)

15. A blatant "startover" case

- Fauziyya Sarki Abubakar (the singer whose picture and YouTube link appear on the our course home page) sings a famous long Hausa poem in rajaz — totally obliterating the best-motivated grid for explaining the meter.
  - Full structure (bracketing and grid) of the meter:



  - The standard linking of heavy and light syllables to the grid:



16. Doing the Level II metrics of the ramal

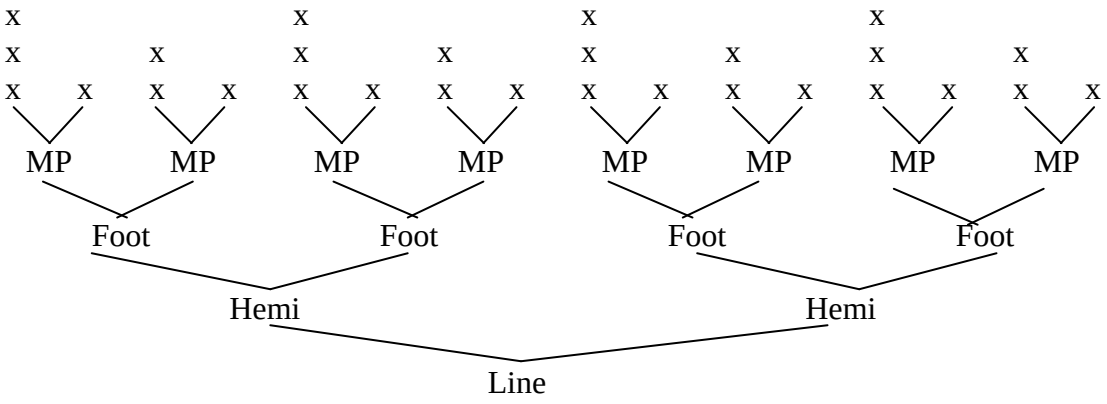
- (15) is a "tense" Lerdahl-Jackendovian grid, with 3 + 2 + 2 and a perhaps-dubious top row.
- But (15) is not a grid for Martians!
  - essentially perfect symmetry of Hemistichs
  - only 2's and 3's are used.
- Constraints defining this complex meter:
  - LINES ARE BINARY

- HEMISTICHS ARE BINARY
- STRONG FEET CONSIST OF A TERNARY MP
- FEET ARE BINARY
- FOOT-INITIAL MP'S ARE TERNARY (weird contextual constraint, Bulgarian in character)
- MP'S ARE BINARY
- HEMISTICHS ARE LEFT-STRONG
- FEET ARE LEFT-STRONG
- MP'S ARE LEFT-STRONG (undominated in UM, per Prince)

- Correspondence constraints:
  - STRETCH and SQUEEZE for moras (perfect)
  - SUPERSTRONG IS LONG (perfect)
  - *FINAL SHORT (forcing the heavy option in final position)
  - maybe something to govern statistical tendencies in the one spot where vv and - alternate; LONG IS STRONG, *STRUC$_{\sigma}$

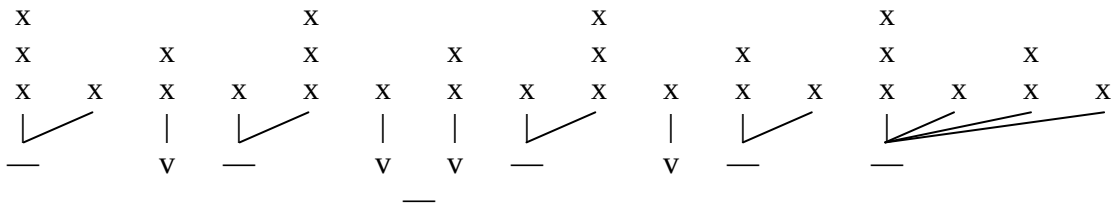
17. Doing the sung rhythm

- Grid is as unmarked as it could possibly be, with nothing but binary and symmetry



- Assignment of syllables *assumes a composed text* and beyond this respects only three properties.

  - *SQUEEZE MORA
  - *STRETCH NONFINAL MORA
  - *EMPTY X



18. How can "utter irrelevance" of Level II be available? Trivial case

- This will happen when the song can be, and is, "sung straight" — poetic and sung grids are identical, and use the same constraints.
- I think this actually happens a lot with English folk song.
  - The grid is dipodic; iambic high and trochaic low (per Prince on MP's)