More on paradigm regularization

(1) What we saw last week

- Phonological processes often apply non-normally within inflectional paradigms (overapplication, also underapplication?)
  - When a phonological process fails to apply as expected, is it because something was learned wrong, or because of extra paradigmatic pressure?
  - Some clear cases of paradigmatic pressure (Spanish stress, underapplication of flapping in *militaristic*, etc.
- OO-$\mathcal{F}$ analysis: normal application somewhere in the paradigm, overapplication elsewhere by IDENT-OO
  - Parallel to reduplication: normal application in one copy, overapplication by IDENT-BR $\gg$ IDENT-IO
  - IDENT among all paradigm members, or to privileged base? (Suggestive evidence that privileged base is needed, at least in some cases; is egalitarian OP-IDENT also crucial in some cases?)

Goals today:

- See how these factors play out in the analysis of a particular phenomenon: double retraction of stress in Russian gen. pl.
- More broadly: step back and consider why such effects occur

(2) Reminder: *yer* alternations in Russian noun paradigms
(Warning: data from Zalizniak dictionary—archaisms may abound)

- *Yer* vowel shows up when no suffix (*yer* in suffix)

'piston'	sg.	pl.
nom.	pórsh'**e**n'	pórshn'i
gen.	pórshn'a	pórshn'éj
dat.	pórshn'u	pórshn'am
acc.	pórsh'**e**n'	pórshn'i
instr.	pórshn'em	pórshn'ami
loc.	pórshn'e	pórshn'ax

- SYLSTRUC $\gg$ **yer*: forces *yer* to vocalize in nom/acc sg (*[porshn'])
- In affixed forms, [shn'] is possible onset, so *yer* does not need to vocalize (**yer* $\gg$ *COMPLEX)

(3) Russian has numerous stress patterns (unpredictable):

- Stress on root (*ot**é**l'* ~ *ot**é**l'a* ~ *ot**é**l'i* 'hotel-nom.sg./acc.sg/nom.pl')
  - Also *pórsh'en'* 'piston' in (1); likewise *plav'en'* 'flux', *d'egot'* 'tar'
- Stress on affix (where possible—retracts when suffix is *yer*; *d**ó**zhd'* ~ *dozhd'**á*** ~ *dozhd'**í*** 'rain')
  - Examples with *yer* alternations:

'day'	sg.	pl.
nom.	d'én'	dn'í
gen.	dn'á	dn'éj
dat.	dn'ú	dn'ám
acc.	d'én'	dn'í
instr.	dn'ém	dn'ámi
loc.	dn'é	dn'áx

'fire'	sg.	pl.
nom.	ogón'	ogn'í
gen.	ogn'á	ogn'éj
dat.	ogn'ú	ogn'ám
acc.	ogón'	ogn'í
instr.	ogn'ém	ogn'ámi
loc.	ogn'é	ogn'áx

∗ Likewise *p'en'* 'stump', *lomót'* 'slice', *pleten'* 'hedge'

- Stress on suffix in singular, root in plural (*kol'es**ó*** ∼ *kol'es**á*** ∼ *kol'**é**sa* 'wheel')

'chisel	sg.	pl.
nom.	dolotó	dolóta
gen.	dolotá	dolót
dat.	dolotí	dolótam
acc.	dolotó	dolóta
instr.	dolotóm	dolótami
loc.	doloté	dolótax

  - Stress in plural is on final syllable of root
  - Likewise *gn'ezdó* 'nest', *zh'erló* 'mouth', *zv'enó* 'link', *putó*, etc.
- Stress on root in singular, suffix in plural (*j**á**kor'* ∼ *j**á**kor'a* ∼ *jakor'**á*** 'anchor')
  - We'll ignore this pattern here

(4) Let's assume, with Kenstowicz, that stress is a lexical property

- Roots want to be stressed or stressless; $\mathcal{F}$(stress) penalizes a root that is inappropriately stressed
- Roots that have different stress in plural are marked [+retraction] (a RETRACTION constraint is violated if a [+retraction] root has suffix stress in the plural)

/dolot-a/$^{-\text{str},+\text{retract}}$	RETRACTION	IDENT(str)
a. dolotá	*!	
☞ b. dolóta		*

(5) The data of interest: double retraction

'trade'	sg.	pl.
nom.	remesló	remésla
gen.	remeslá	**remésel**
dat.	remeslú	reméslam
acc.	remesló	remésla
instr.	remeslóm	reméslami
loc.	remesljé	reméslax

'string'	sg.	pl.
nom.	voloknó	volókna
gen.	volokná	**volókon**
dat.	voloknú	volóknam
acc.	voloknó	volókna
instr.	voloknóm	volóknami
loc.	volokníé	volóknax

- Likewise *dupló* 'hollow', *b'edró* 'hip', *brjevnó* 'log', *v'esló* 'oar', *p'atnó* 'blemish', etc.

(6) Deriving double retraction with a paradigmatic constraint

- Not predicted straightforwardly by RETRACTION constraint

/remesEl-∅/$^{-\text{str},+\text{retract}}$	RETRACTION	IDENT(str)
a. remesél		*
b. remésel		*
c. rémesel		*

  - Kenstowicz marks extra $\mathcal{F}$ violations as stress moves left in the root (favors *remesél*)
  - If we assume that roots simply want to be stressed or stressless, then all have equal violations (no winner, rather than wrong winner)
- Paradigmatic pressure gives *remésel* the edge over *remesél*/ *rémesel* (cand. *a* $\succ$ cand. *b*); but unfortunately, if evaluated a la McCarthy, it incorrectly prefers uniform [remésl-] paradigm!

/remesEl-o/, /remesEl-a/, /remesEl-u/, /remesEl-o/, /remesEl-om/, /remesEl-je/, /remesEl-a/, /remesEl-E/, /remesEl-am/, /remesEl-a/, /remesEl-ami/, /remesEl-ax/ [−str,+retract]		OP-Ident(str)	RETRACTION	IDENT(str)
	a. remesló, remeslá, remeslú, remesló, remeslóm, remesljé, remésla, remésel, reméslam, remésla, reméslami, reméslax	$12 \times 6 = 72$*		6*
	b. remesló, remeslá, remeslú, remesló, remeslóm, remesljé, remésla, remesél, reméslam, remésla, reméslami, reméslax	$(6 \times 6) + (5 \times 7) + 11 = 82$*		6*
	c. remesló, remeslá, remeslú, remesló, remeslóm, remesljé, remeslá, remesél, remeslám, remeslá, remeslámi, remesláx	22*	5*!	*
☞	d. reméslo, remésla, reméslu, reméslo, reméslom, reméslje, remésla, remésel, reméslam, remésla, reméslami, reméslax	0		12*!

If evaluated "all or nothing" (all match or there's disagreement), or "count the allomorphs", same problem:

		All must match	*Allomorphy
	a.	* (pl. different)	* (pl.)
	b.	* (pl. different, gen. pl. yet different)	** (pl., gen. pl.)
	c.	* (gen. pl. different)	* (gen. pl)
☞	d.	(all same)	(all same)

– It seems that sg. and pl. must act as separate paradigms, or plural will cause retraction to overapply *everywhere* (singular as well as gen. pl.)

(7) Is a paradigmatic constraint really needed here?

- We stated retraction as: don't be stressed on the affix in the plural
- Maybe we can eliminate *[remesél] by reformulating it: don't have final stress in plural

☞ Now the problem is *reméslami*, which could be *remeslámi*, avoiding final stress and matching the singular

(8) Must the paradigmatic constraint be global optimization (OP)?

- No: base-identity would work fine, as long as base for plural forms is something like the nom. pl. (rather than gen.), and base for singular forms is not a plural form.
- BaseIdent(stress) = identical to nom. pl.

/remesEl-a/$^{-\text{str},+\text{retract}}$		BASEIDENT(str)	RETRACTION	IDENT(str)
	a. remeslá		*!	
☞	b. remésla			*

/remesEl-∅/$^{-\text{str},+\text{retract}}$		BASEIDENT(str)	RETRACTION	IDENT(str)
	a. remesél	*!		*
☞	b. remésel			*

- This works fine, but it immediately raises the question of why the nom. pl. (and why plurals distinct from singulars)
  – More on this in a minute

(9) Some additional evidence in favor of BASEIDENT

- Another phenomenon: mixed stress in plural of masculine nouns

'stone, gem'	sg.	pl.
nom.	kám'en'	kámn'i
gen.	kámn'a	kamn'éj
dat.	kámn'u	kamn'ám
acc.	kám'en"	kámn'i
instr.	kámn'em	kamn'ámi
loc.	kámn'e	kamn'áx

'fingernail'	sg.	pl.
nom.	nógot'	nógt'i
gen.	nógt'a	nogt'éj
dat.	nógt'u	nogt'ám
acc.	nógot'	nógt'i
instr.	nógt'em	nogt'ámi
loc.	nógt'e	nogt'áx

  - Likewise *kór'en'* 'base', *kógot'* 'claw', *lapót'* (no def), *lókot* 'nudge',
  - These words escape paradigmatic constraint (like *kol'có* 'ring', discussed by Kenstowicz, which lacks double retraction in gen. pl.: *kol'éc*, not **kól'ec*)
- Some words with mixed plurals are apparently in the process of leveling[1]

'stalk'	sg.	pl.
nom.	stébel'	stébl'i
gen.	stébl'a	stebl'éj ∼ stébl'ej
dat.	stébl'u	stebl'am ∼ stébl'am
acc.	stébel'	stébl'i
instr.	stébl'em	stébl'ámi ∼ stébl'ami
loc.	stébl'e	stebl'áx ∼ stébl'ax

  - Likewise *st'erzh'en'* 'core, kernel, shaft', *p'erst'en'* (no def), *ugol'* 'coal'
  - If Russian had a high-ranking "Plural-Uniformity" constraint, then all plural forms would get to caucus and decide the stress pattern of the leveled plural
  - Since this paradigm doesn't have suffixless gen. pl., there's no markedness consideration to push it one way or the other; majority rules predicts suffix stress (4 against 2)
  - Yet the paradigm is pushed towards the nom./acc. pl.

(10) Why would the nom. pl. serve as base?

- No form is a substring of any other form; unlike cyclicity cases
- Kenstowicz (1995), Benua (1997): in inflectional paradigms, the base is the "unmarked form" (nom. sg., 3sg, etc.)
  - Here we do need a nom., but somewhat more complex because it's just within the pl.

(11) Yiddish final devoicing example from last time

- [vaɪp], [vaɪber] ⇒ [vaɪb], [vaɪber]
- Here too, the nom. pl. appears to determine the direction of leveling in achieving the new, uniform paradigm
- Perhaps even more striking, because plural affects singular

(12) Leveling to the *more contrastive form* (Vennemann 1972, Albright 2002)

- Intuition: leveling to [vaɪp], [vaɪper] would be a bad move, because it would neutralize the distinction between /b/-final words and /p/-final words
- "Attraction to the unmarked" often has this danger (attraction to neutralization); observed cases of paradigm leveling frequently work in the opposite direction, *enhancing* lexical contrasts
- Proposal: the base form is the one that most clearly displays lexical contrasts (phonological properties, morphological class, etc.)

[1] It might be complete by now; the dictionary is a bit old.

(13) Predictions of the "contrastive base" theory:

- Yiddish: faithfulness to plural, where stem-final voiced obstruents could surface
- Russian:
  - Nom./acc. sg. have ∅ suffix in many words; subject to final devoicing (same problem as Yiddish)
  - Among suffixed forms, gen./dat./loc. sg. and dat./instr./loc. plural have same endings for many different classes of nouns
  - Nom./acc. pl. has virtue of showing final voicing, and also gender/morphological class (at least to a large extent). Also shows stress of plural (at least for most words)
- Possibility of identifying base for base-prioritizing $\mathcal{F}$ in a non-circular way

The origins of paradigm uniformity

(14) Some mysteries of the paradigm uniformity cases that we've seen so far

- Russian: not all words affected (perhaps sweeping through the lexicon—but very slowly)
  - This is not what we expect from simply reranking a paradigm uniformity condition (in fact, it complicates the situation significantly, by creating multiple patterns)
- Latin: not all classes of words affects
  - Rhotacism overapplies in polysyllabic masc./fem. nouns; not in monosyllables, and not in neuters; why would uniformity constraints distinguish between different types of words in this way?
- Russian: not all parts of the paradigm affected
  - Uniformity is enforced just within plural (and, to an even greater extent, in all forms of diminutives; data not shown here, but alluded to in Kenstowicz 1997)
  - Why are paradigms broken up these ways?
- Why do languages with alternations suddenly stop tolerating them?

(15) Why are only some words, or some types of words, leveled?

- Seems to require highly articulated set of uniformity conditions
  - OO $\mathcal{F}$ for nouns
  - OO $\mathcal{F}$ for masculine nouns
  - OO $\mathcal{F}$ for polysyllabic nouns
  - OO $\mathcal{F}$ for the noun *m'est'*
- Why would some of these conditions suddenly get promoted, leaving behind others (where alternations remains)?

(16) Word-by-word effects

- As discussed last week, an alternative account of the change of *m'est'* ∼ *mst'i* to *m'est'* ∼ *m'est'i* is that learners incorrectly learned the UR of this particular word (/m'est'/ instead of /m'Est'/)
  - Hinges on the idea that data from [mst'-] forms (which are actually most of the paradigm) was not sufficient to learn the alternation (either too rare, or ignored/discounted for some other reason)
  - This seems unlikely to happen for all words of the language at once, but certainly it could happen sporadically
  - As more words lose the alternation, it becomes rarer (more irregular), and perhaps correspondingly harder to learn in the words that do have it (?)

- In a language with both alternating and non-alternating words (possibility of /m'est'/ or /m'est'/), regularization of individual lexical items could just follow from wrong assumptions about the UR
- Important prediction: mistakes could also go in the other direction (introduction alternations), if conditions are right for learner to assume /m'Est'/ by default
  - For example, if alternation is actually the dominant pattern in the lexicon

Upshot: word-by-word effects may not be an OO effect at all

(17) Class-by-class effects: a similar story

If learners need to make an assumption about the UR of a word, their guess could be guided by other relevant properties of the word

- Are *yer* alternations more common in monosyllables? in words that end in [n]? in masculine nouns? etc...
- Russian:
  - Lots of stems with *yer* alternations end in [l], [n]
  - Perhaps not so many ending in [st']
- Latin:
  - Lots of rhotacizing stems among neuters, relatively fewer among masc. and fem. (compared to non-alternating [r] stems *soror* ∼ *sorōris*).
  - Proportion of rhotacizing stems also higher among monosyllables than polsyllabic nouns.
  - Alternations sorted themselves out along these lines.

So: class-by-class effects may originate as word-by-word effects (does this work in all cases?)

(18) Partial leveling: only plural, only diminutives, only past, etc.

- One possibility: specific $\mathcal{F} \gg$ more general $\mathcal{F}$
  - IDENT among [+pres,+plural], IDENT among [+past,+sg], etc. $\gg$ IDENT among [+pres.], IDENT among [+past] $\gg$ IDENT among all forms
  - "Nested" paradigm structure

(19) Burzio (2002, 2005): *Representational Entailment Hypothesis*

- Greater representational overlap between two entities ⇒ greater "attraction"
- Schematic example: [m'est'] 'feud, vengeance'

  Entailments: (just a few; actually would be an enormous lattice)
  - FEUD nom. sg. ⇒ [m'est']; nom. sg. ⇒ ∅; [m'] ⇒ [e]; [m'] ⇒ [s]; [m'] ⇒ [t]; [e] ⇒ [s]; ...; [s] ⇒ [t']; etc.
  - FEUD nom. pl. ⇒ [mst'i]; nom. pl. ⇒ [i]; nom. sg. [m] ⇒ nom. pl. [m]; nom. sg. [s] ⇒ nom. pl. [e]; [m] ⇒ [e]; [m] ⇒ [s]; [m] ⇒ [t]; [e] ⇒ [s]; ...; [s] ⇒ [t'];
  - Crucially, a few entailments are false, like FEUD ⇒ [m'est']; nom. sg. [m'est'] ⇒ nom. pl. [m'est'] (because of alternations)
  - However, the greater the amount of overlap (more entailments, fewer entailment violations), the greater the attraction
  - Under this view, a paradigm is not a privileged or arbitrary entity; it is a set of forms that share so much in common that even greater regularity is enforced
  - "The plural paradigm" is more cohesive simply because the elements share more (they are all [+plural], so additional representational entailments involving [+plural] also hold between them

(20) The problem: what determines which subparadigms are "most cohesive" ?

- Kurylowicz (1945/1960), Bybee (1985), etc.: uniformity often found within one tense/aspect/mood, but rarely (if ever) in one number, or person across all tenses/aspects/moods
- Not predicted if ranking of $\mathcal{F}$ is determined by the specificity (number of features): IDENT[2nd person, sg.] should be as important as IDENTpres., plural
- Also not predicted automatically by Representational Entailments Hypothesis (person entailments should be just as good as tense entailments)

This problem is probably not solvable within phonology alone; a more satisfying solution would be one that unifies generalizations about morphosyntactic features (morphology) and also phonological cohesiveness

(21) Summary of inflectional paradigms

- Another area where we see effects of overapplication and (and underapplication?)
- As with reduplication and derivational paradigms, OO correspondence has potential to explain patterns that are awkward or impossible to describe in serial terms