Exceptions

Class 4: Limits on prediction

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So far…

- Lexicons show surprising degree of predictability for neutralized (unpredictable) properties
  - Final obstruent voicing in Dutch, Turkish
  - Mid vowel vs diphthong contrast in Spanish
- Two possible interpretations
  - In general, learners try to extract as much predictability as they can from the lexicon
  - Specifically in cases of neutralization, speakers sometimes need to predict the value

Undoing neutralization

- Why would Dutch/Turkish speakers need to predict voicing?
- One possibility: only happen to know singular/unsuffixed form, need to produce plural/suffixed form
- Another possibility: lexical representation is always the singular/unsuffixed form, grammar tries to predict all plurals/suffixed forms

Spanish verbs

Clahsen et al. (2002b)

- Unpredictable properties: conjugation class (theme vowel: *-a-*, *-e-*, *-i-*), irregular stem alternations, suffix differences

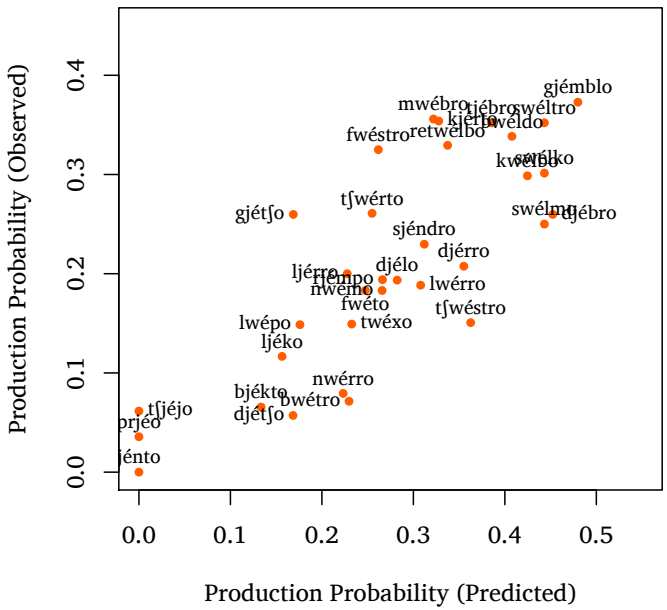
Regular:				Irregular:			
Conj.		Pres. ind.	Indef. past ind.	Conj.		Pres. ind.	Indef. past ind.
1 *-a-*	1sg	canto	canté	1 *-a-*			
cantar ‘sing’	2sg	cantas	cantaste				
	3sg	canta	cantó				
	1pl	cantamos	cantamos				
	2pl	cantáis	cantasteis				
	3pl	cantan	cantaron				
2 *-e-*	1sg	como	comí	2 *-e-*	1sg	pongo	puse
comer ‘eat’	2sg	comes	comiste	*poner* ‘put’	2sg	pones	pusiste
	3sg	come	comió		3sg	pone	puso
	1pl	comemos	comimos		1pl	ponemos	pusimos
	2pl	coméis	comisteis		2pl	ponéis	pusisteis
	3pl	comen	comieron		3pl	ponen	pusieron
3 *-i-*	1sg	vivo	viví	3 *-i-*	1sg	vengo	vine
vivir ‘live’	2sg	vives	viviste	*venir* ‘come’	2sg	vienes	viniste
	3sg	vive	vivió		3sg	viene	vino
	1pl	vivimos	vivimos		1pl	venimos	vinimos
	2pl	vivís	vivisteis		2pl	venís	vinisteis
	3pl	viven	vivieron		3pl	vienen	vinieron

Many types of irregularity

- Unpredictable theme vowel: *cant**a**r* vs. *com**e**r* vs. *viv**i**r*
- Stem alternations
  - Vowel alternations, such as diphthongization: ***ven**imos* ‘we come’ ∼ ***vien**e* ‘he comes’ (also raising, not shown here)
  - Others—e.g., *saber* ‘know’: 1sg pres. ***sé***, 3sg pres. ***sab**e*, 1sg past ***sup**e*, 3sg past ***sup**o*
- Affixal differences: *com**í*** ‘I ate’ vs. *pus**e*** ‘I put’

Generalization among adults

- The default theme vowel is *a* (*-ar* conjugation class)
  - Loanwords, denominal verbs, etc.
  - Sometimes with additional *-e-* morpheme: *blogar/bloguear*
- Mid vowels: non-alternation is the default, but with IOR's
  - Reminder from last time: Albright et al. (2001) wug test



Rough sketch of historical trends

- Loss of diphthongization is well-attested in the history of Spanish (Penny, 2002; Morris, 2005)
- Velar stops in 1sg: have usually been added, not deleted
  - An “irregularization” change in the history of Spanish
  - Perhaps changes in the number of verbs that belong to one pattern or the other, for some reason? (Dialect mixture may be at least partly to blame)
- Past tense regularization
  - See Penny (2002) (we won’t discuss much here)

Rough sketch of historical trends (*cont.*)

- Conjugation class shifts: appear to be rare/restricted
  - Early loss of Latin stressless *-ere* class (3rd conjugation) (Davis & Napoli, 1994)
  - Apparently not so commonly observed among the remaining three Spanish classes
  - Note that the do occur commonly when accompanied by extra morphology: *colorir* ⇒ *colore**ar*** ‘to color’, *balbucir* ⇒ *balbucear* ‘stammer’, *cocer* ⇒ *coci**n**ar* ‘cook’
  - Not common: hypothetical change of *nutrir* ‘nourish’ ⇒ **nutrar*

Child errors: Clahsen et al. (2002b)

- Clahsen et al. counted all inflected verb forms, counting incorrectly inflected and correctly inflected forms
  - Diphthongization and other types of stem changes counted separately, since status of diphthongization as irregularity is controversial
  - As far as I can tell, counted only inflection errors (not agreement errors)—e.g., common use of 3sg default person/number in place of others (Hernández-Pina 1984; Radford and Ploennig-Pacheco 1995; Grinstead 1998)

Child errors: Clahsen et al. (2002b) (*cont.*)

- Results, at a broad pass: strong overregularization bias (Tables 2–3, p. 601–602)

TABLE 2. *Incorrect verb forms produced by each child*

	Present tense and imperatives		Past tense		Participles		Subjunctive	
	Irregular incorrect	Regular incorrect	Irregular incorrect	Regular incorrect	Irregular incorrect	Regular incorrect	Irregular incorrect	Other errors
María	24		1		1			
Koki	18		7	1				
Idaira	5		7		1			2
Pablo	24		50	1				1
Solange			1					
Rosmary	1		2		1			
Child 1	4		1		1		1	
Child 5			6		3			
Child 7			4					1
Child 10	1							
Child 11			1					
Child 12			2					
Child 13			1					
Total	77		83	2	7		1	4

Child errors: Clahsen et al. (2002b) (*cont.*)

TABLE 3. *Distribution of error types*

A. Stem errors		B. Suffixation errors	
I. overregularizations	116	I. overregularizations (n = 132)	
		a. 1st conjugation overapplications	8
		b. conjugation-internal regularizations	124
II. irregularizations	1	II. irregularizations	0
III. other errors	3	III. other errors	1
Totals	120	*Totals*	133

- Unpacking this a bit
  - "Stem regularization" = using form of stem found infinitive/1pl present instead of another form (e.g., ***sab****o* instead of ***sé*** 'I know', cf. infin. ***sab****er*)

Child errors: Clahsen et al. (2002b) (*cont.*)

- "Stem irregularization": just one example, ***ca****er* 'fall', 3sg past ***cay****ó*, 1sg past ***ca****í* $\Rightarrow$ ****cay****í*
- "Conjugation class regularization"$=$ using class 1 -*a*- instead of classes 2/3
- "Conjugation class-internation regularization" $=$ *venir* 'come' $\sim$ *vin****ó*** 'he came' $\Rightarrow$ **viv****ió*** (switching to regular affix for class 3)

Striking asymmetries

- Calling this “overregularization” only tells part of the story
- Stem alternations in past are often lost in favor of form found in present infinitive
- Stem alternations in present stressed forms are often lost in favor of form found in present infinitive (and other stressed forms): Table 5, p. 605

Striking asymmetries (*cont.*)

TABLE 5. *Verb forms that require diphthongized stem vowels*

	Present tense and imperatives		
	Type of alternation	Correct (diphthongized) forms	Incorrect (non-diphthongized) forms
María	o ~ ue	110	14
	u ~ ue	2	13
	e ~ ie	250	40
Koki	o ~ ue	41	12
	u ~ ue	1	
	e ~ ie	148	21
Idaira	o ~ ue	16	
	u ~ ue		
	e ~ ie	35	7
Totals		603	107

- Error rate on diphthongs is quite high (≈15%)

Striking asymmetries (*cont.*)

- Diphthongs never used in forms outside of where they should occur (*venimos* ‘we come’ $\Rightarrow$ **vienimos* not attested)
    - This may be phonotactic: *Stressless Diphthong (not inviolable in Spanish, but not many contexts in which violations are allowed)
- Non-alternating verbs never incorrectly diphthongized (*cóme* ‘eats’ $\Rightarrow$ **cueme* not attested)
    - This error would be perfectly legal phonotactically, since indeed, many verbs have diphthongization in stressed forms like the 3sg

Striking asymmetries (*cont.*)

- Stem alternations in 1sg are often lost in favor of form found in 3sg (or, more general regularization to form found in infinitive)
  - ***sal****ir* ‘leave’ ∼ ***sal****e* (3sg) ∼ ***salg****o* (1sg) ⇒ ******sal****o*
  - ***conoc****er* ‘know’ ∼ ***conoc****e* (3sg) ∼ ***conozc****o* ⇒ ******conoz****o*
  - ***o****ír* ‘hear’ ∼ ***oy****e* (3sg) ∼ ***oig****o* ⇒ *****oyo***
  - ***ten****er* ‘have’ ∼ ***tien****e* (3sg) ∼ ***teng****o* (1sg) ⇒ *****tien****o*, *****ten****o*
- Minority suffixes are often replaced by their regular counterparts
- Minority conjugation classes, on the other hand, are rarely replaced by default class 1 *-a-*
  - Example cited concerns difference in suffix itself, not in theme vowel: *quer****ía*** ‘he wanted’ ⇒ **quer****íba*** (cf. class 1 *amába* ‘he loved’)

Striking asymmetries (*cont.*)

- p. 603 “It is important to note that among the stem errors, there are no conjugation class errors. Children produced, for example, **romp-i-da* instead of *rota* ‘broken’, but not **romp-a-da*, i.e. they combined the regular root *romp-* with the 2nd conjugation theme vowel *-i-*, treating *romper* as a regular 2nd conjugation verb, rather than an irregular one.”
- This is by no means a logical necessity! Conjugation class is ambiguous in several very frequent inflected forms (1sg, 2sg, 3sg, 3pl present and past)

Underscoring the parallels to attested changes

- Vowel alternations often lost by changing stressed forms (stressless forms remain constant)
- 1sg velar often lost or added (depending on dialect?)
- Conjugation class switches are rare

☞ Same asymmetries seen in both domains

  - Confirms link between overgeneralization and analogical change
  - To be explained: why this directionality?

Partial overregularization

An effect seen in Spanish, but not so clearly in English:

- English verbs can be irregular in two ways
  - Stem alternations, null or overt suffix
  - Often correlated: *ate* has V change with no affix, *walked* has affix with no vowel change
  - Sometimes dissociated: *heard* (V change + affix), *shed* (no V change, no affix)
- In principle, should be possible to regularize just one of these properties
- However, this isn't all that common in English
  - *ate* $\Rightarrow$ **ated*, **eat*
  - Double marking errors occur, but are relatively rare

Partial overregularization (*cont.*)

- Null marking occurs, but with different time course than other overregularizations (generally earlier)

- Independent regularization of properties may be more common in Spanish
  - *venir* ‘come’ $\sim$ *vino* ‘came-3sg’ $\Rightarrow$ **vinió* (irreg stem preserved, full reg. would be *venió*)
  - Difficult to explain as failure of blocking (partial recall of *vino*?)
  - Apparently not paralleled by historical changes?
  - Clahsen et al. do not attempt to test whether such mixed errors occur more/less often than one would expect them to as independent co-occurrence of two errors

The very general lesson from Spanish

- Once we turn to a language with more inflected forms and more types of irregularity, it's clear that there are numerous logically possible reanalyses that don't occur
- In fact, English shows similar directionality effect, though not so surprising due to frequency difference

$$make \sim made \Rightarrow {}^{\star}maked$$

$$make \not\Rightarrow {}^{\star}may \sim made$$

- Need a restrictive model of which forms are defined in relation to which other forms
- Also may be the case that child errors and historical changes are not perfectly correlated, though more data is needed on this
- Data from English suggests that one thing to check would be whether adult errors in various settings are different from child errors, and more closely mirror historical change

German verbs

Another case: German irregular verb inflection

- German verbs have many types of irregularity, both within and across tenses
- We focus here on irregular present tense alternations

	Infinitive	1sg	2sg	3sg	1pl	2pl	3pl	V
Regular	leben ‘live’	lebe	lebst	lebt	leben	lebt	leben	[eː]
	blicken ‘glance’	blicke	blickst	blickt	blicken	blickt	blicken	[ɪ]
	sagen ‘say’	sage	sagst	sagt	sagen	sagt	sagen	[aː]
	säen ‘sow’	säe	säst	sät	säen	sät	säen	[ä]
Irregular	geben ‘give’	gebe	gibst	gibt	geben	gebt	geben	[eː] ∼ [ɪ]
	sehen ‘see’	sehe	siehst	sieht	sehen	seht	sehen	[eː] ∼ [iː]
	tragen ‘carry’	trage	trägst	trägt	tragen	tragt	tragen	[aː] ∼ [ä]
	schlafen ‘sleep’	schlafe	schläfst	schläft	schlafen	schlaft	schlafen	[aː] ∼ [ä]
	laufen ‘run’	laufe	läufst	läuft	laufen	lauft	laufen	[aʊ] ∼ [ɔɪ]

Clahsen et al. (2002a)

- Longitudinal data from 7 German-acquiring children
- Extracted all tokens of verbs from [eː] ∼ [ɪ] (and [i]?) and [aː] ∼ [ä] classes
- Also elicited verb forms from older children (6–10yr) with auditory fill-in-the-blank task (12 *geben*-type verbs, 10 *schlafen*-type, 22 fillers)

Results, part 1: many errors among young children

- Vowel of infinitive/1sg/1pl/2pl/3pl used in place of 2sg/3sg vowel
- 84/204 irregular verb tokens contained such errors (41%)
  - 73 had correct person marking, but wrong form of stem: *er lauft* 'you run' instead of *läuft*
  - 11 also had incorrect person marking (inf/1pl—e.g., *du nehmen* 'you take-INF' instead of *du nimmst* 'you take-2SG'); not really wrong stem vowel in this case
- Vowel of 2sg/3sg used for other forms: just 10 tokens
  - *Alle fäll da runter* 'all fall down' (should be *fallen*)
  - *Ich gib dir das* 'I'll give you that' (should be *geb'*; though note that some dialects do have *gib*)
  - *Ich sieh* 'I see' (should be *sehe*; some dialects do have [i], but I think usually with also a consonant alternation: *i si(e)ch*)

Results, part 1: many errors among young children (*cont.*)

- Two asymmetries
  - Statistical: raised/fronted vowel rarely extended from 2/3sg
  - Of kind: when 2/3sg vowel is generalized, resulting error uses a legitimate word form (e.g., *gib*, *sieh* = imperative), whereas changes in other direction create innovative and otherwise unattested words (e.g., *lauft*)
- Older children: similar result, even cleaner
  - Many errors, all involving use of infinitive/plural vowel in 2/3sg
  - Very clear frequency effect (lower freq more susceptible to regularization)
  - Rate of overregularization decreases gradually with age

Results, part 1: many errors among young children (*cont.*)

Table 3: Elicited stem forms

Required stem form and stem frequency	Number of stem errors	Number of correct stems	Error percentages
-i- / high frequency	19	136	12.2%
-i- / low frequency	89	59	37.3%
-ä- / high frequency	9	118	7.0%
-ä- / low frequency	51	74	40.8%
Totals	168	387	30.2%

Linking this to historical data

- Alternation of [aː] ∼ [ä] has been lost in many dialects (Bavarian, Alemmanic)
    - Though dialects that keep it tend to hold on to it robustly, and even extend it
- By contrast, [e] ∼ [i] appears to be quite stable in German dialects
    - Reported to have been lost in Lothringian (Follmann, 1909), but nowhere else?
- Also correlated with difference in whether alternation is seen in imperative
    - *geben* ‘to give’ ∼ *gib*! (imp) ∼ *gibt* (3sg)
    - *tragen* ‘to carry’ ∼ *trag*! (imp) ∼ *trägt* (3sg)

  (Not clear to me how to make use of this fact, but I simply point it out in passing)

Summary of child German data

- Like Spanish and English, an overwhelming consistency in direction of child errors
    - Two independent alternations lost in same direction (towards vowel of infinitive/plural)
- Not as many distinct processes compared here as in Spanish, but there are other kinds of German verbs that could be compared
- This consistent directionality demands an explanation (why should not alternating be considered “regular”, and why should alternating verbs become non-alternating by extending one vowel as opposed to the other?)

Summary/refrain

- Elimination of lexical exceptions is an important and uncontroversial mechanism in driving language change
- Languages with larger numbers of kinds of irregularity give us the opportunity to see more kinds of overregularization
- In the cases discussed here, striking degree of consistency in directionality of which relations get regularized
- Next: tackle problem of why certain properties are rarely changed by children or diachronically (conjugation class in Spanish, infinitive/pl root vowels in German) while others are

Korean verbs

Korean verb suffixes

Three basic affix shapes (not exhaustive)

- Invariant C-initial
  - *-ta* ‘decl.’, *-ko* ‘and’, *-nɨn* ‘REL’
- ɨ-initial: e.g., ***-(ɨ)myən*** ‘conditional’
  - C after vowels and liquids: /ka-(ɨ)myən/ → ***ka-myən*** ‘go-COND.’
  - [ɨ] after other consonants: /mək-(ɨ)myən/ → ***məg-ɨmyən*** ‘eat-COND.’
- A-initial: e.g., ***-ə/-a*** ‘informal imperative’
  - Vowel harmony: [a] after preceding [o] (and sometimes [a]), [-ə] otherwise
  - /mək-A/ ‘eat’, /cop-A/ ‘be narrow’, /kat^{h}-A/ ‘be alike’ → [məg**ə**], [cop**a**], [kat^{h}**a**] ∼ [kat^{h}**ə**]

Phonologically motivated allomorphy

Adapted from Kenstowicz & Sohn, 2008

Suffix	C-final /mək/ ‘eat’	Nasal-final /sin/ ‘put on’	Liquid-final /yəl/ ‘open’	V-final /ka/ ‘go’	Gloss
-ta	məkt’a	ʃint’a	yəlda	kada	indicative
-təla	məkt’əɾa	ʃint’əɾa	yəldəɾa	kadəɾa	retrospective (‘they were …’)
-ko	məkk’o	ʃink’o	yəlgo	kago	conjunctive (‘… and’)
-ca	məkc’a	ʃinc’a	yəlja	kaja	propositive ‘let’s …’
-se	məks’e	ʃins’e	yəse	ka_se	propositive (formal)
-ni	məŋni	ʃinni	yə_ni	kani	interrogative
-nɨlako	məŋnɨɾago	ʃinnɨɾago	yə_nɨɾago	kanɨɾago	‘because …’
-(ɨ)n	məgɨn	ʃinɨn	yən	kan	relative
-(ɨ)myən	məgɨmyən	ʃinɨmyən	yəlmyən	kamyən	conditional
-(ɨ)myənsə	məgɨmyənsə	ʃinɨmyənsə	yəlmyənsə	kamyənsə	‘while …’
-(ɨ)lə	məgɨɾə	ʃinɨɾə	yəllə	kaɾə	objective (‘in order to …’)
-(ɨ)ni	məgɨni	ʃinɨni	yəni	kani	effective (‘as a result of …’)
-(ɨ)na	məgɨna	ʃinɨna	yəna	kana	adversative (‘although …’)
-A	məgə	ʃinə	yəɾə	ka	imperative
-As’-ta	məgətt’a	ʃinətt’a	yəɾətt’a	katt’a	past (declar.)
-Ala	məgəɾa	ʃinəɾa	yəɾəɾa	kaɾa	imperative

Irregular allomorphy

- In addition to the ‘major’ alternations illustrated on the previous slide, Korean verbs exhibit a wide variety of minor phonological processes and morphophonological irregularities
- These processes create neutralizations and ambiguities in various inflected forms (C-initial, ㅣ-initial, A-initial)
- Numerous attested reanalyses/innovations based on these ambiguities
- Empirical claim (Kang, 2006): these reanalyses are consistently based on A-initial forms, rather than C-initial or ㅣ-initial forms

Elision of stem-final vowels

- Hiatus resolution: ɨ → ∅ / _ +V, and ə → ∅ / _ +ə
  - /apʰɨ-A/ ‘sick’, /sɨ-A/ ‘use’ → [apʰa], [sə]
  - /sə-A/ ‘stop’ → [sə]
- Ambiguity between C-final and ɨ,ə-final verbs

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
C-final	kapʰə	kapʰɨmyən	kapt’a	‘repay’
	kipʰə	kipʰɨmyən	kipt’a	‘be deep’
ɨ-final	apʰə	apʰɨmyən	apʰɨda	‘sick’
	kip’ə	kip’ɨmyən	kip’ɨda	‘happy’
ə-final	sə	səmyən	səda	‘stop’
	kənnə	kənnəmyən	kənnəda	‘cross’

- Attested reanalysis: /ə/ ⇒ /ɨ/ (Kang, 2006)

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
	sə	səmyən ⇒ *sɨmyən	səda ⇒ *sɨda	‘stop’
cf.	apʰə	apʰɨmyən	apʰɨda	‘sick’

- Regularization: /ɨ/ outnumbers /ə/, verb too short to be C-final

Glide formation of stem-final vowels

- /i+V/ → [jV], /u+V/ → [wV] (optional); /o+V/ → [wV] (usually?)
  - Glide formation: /ki-A/ → [kyəː] ‘crawl’; /s’o-A/ → [s’waː] ‘shoot’
  - Glide deletes after affricates: /cʰi-ə/ → [cʰə] ‘hit’
- Ambiguity with V-initial affixes: /Ci-ə/ or /Cyə-ə/?

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
i-final	kiə ∼ kyəː	kimyən	kida	‘crawl’
	cʰəː	cʰimyən	cʰida	‘hit’
u-final	cuə ∼ cwəː	cumyən	cuda	‘give’
o-final	s’waː	s’omyən	s’oda	‘shoot’
yə-final	kʰyəː	kʰyəmyən	kʰyəda	‘turn on’ (Mid K/dial.)
	pʰyəː	pʰyəmyən	pʰyəda	‘smooth out’ (Mid K/dial.)

- Attested reanalysis: Seoul Korean

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
	kʰyəː	kʰyəmyən ⇒ ☆kʰimyən	kʰyəda ⇒ ☆kʰida	‘turn on’
	pʰyəː	pʰyəmyən ⇒ ☆pʰimyən	pʰyəda ⇒ ☆pʰida	‘smooth out’
cf.	kyəː	kimyən	kida	‘crawl’

  - Regularization: more /i/ than /yə/-final verbs

Stem-final glides

- Also attested: loss of /i/ after affricates

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
Orig.	kaja/kajə	kaj**i**myən	kaj**i**da	‘take’
⇒ɨ-final	kaja/kajə	kaj**i**myən ⇒ *kaj**ɨ**myən	kaj**i**da ⇒ *kaj**ɨ**da	
cf.	ap^{h}ə	ap^{h}ɨmyən	ap^{h}ɨda	‘sick’
⇒C-final	kaja/kajə	kaj**i**myən ⇒ *kaj**ɨ**myən	kaj**i**da ⇒ *ka(t)t’a	
cf.	kip^{h}ə	kip^{h}ɨmyən	kipt’a	‘be deep’

  - Jun (2007) finds that all are accepted, at least for some verbs
- As with elision, ambiguity before A-suffix leads to reanalyis ⇒ innovative ɨ-suffix, C-suffix forms

Laryngeal-final roots

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
V-final	kiə ∼ kjəː	kimyən	ki**d**a	‘crawl’
	kwaː	komyən	ko**d**a	‘stew’
	s’waː	s’omyən	s’o**d**a	‘shoot’
/h/-final	c’iə	c’iɨmyən	c’i**tʰ**a	‘pound’
	coa	coɨmyən	co**tʰ**a	‘be good’
	mana	manɨmyən	man**tʰ**a	‘be many’
/s/-irreg	ciə	ciɨmyən	ci**t’**a	‘compose’
	naː	naɨmyən	na**t’**a	‘get better’
	puə	puɨmyən	pu**t’**a	‘pour’
nasal reg.	ʃinə	ʃinɨmyən	ʃin**t’**a	‘put on’

- Verbs like ‘pound’, ‘compose’, etc. block glide formation/coalescence
- They also act C-final before ɨ-initial suffixes, and unexpectedly cause either aspiration or tensification of a following obstruent

Laryngeal-final roots (*cont.*)

- Some reanalyses: based on ambiguity in A-form

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
	koa ~ kwaː	komyən ⇒ *koɨmyən	koda ⇒ *kot’a	‘stew’
	muɾə	mulmyən ⇒ *muɾɨmyən	mulda ⇒ *mult’a	‘bite’
	s’aː	s’aɨmyən	s’at^{h}a ⇒ *sat’a	‘stack’
	k’ɨnə	k’ɨnɨmyən	k’ɨnt^{h}a ⇒ *k’ɨnt’a	‘cut’
cf.	puə	puɨmyən	put’a	‘pour’
	koa ~ kwaː	komyən ⇒ *koɨmyən	koda ⇒ *kot^{h}a	‘stew’
	iɾə	ilmyən ⇒ *iɾɨmyən	ilda ⇒ *ilt^{h}a	‘wash rice’
	anə	anɨmyən	ant’a ⇒ ant^{h}a	‘hug’
	naː	naɨmyən	nat’a ⇒ nat^{h}a	‘get better’
cf.	k’ɨnə	k’ɨnɨmyən	k’ɨnt^{h}a	‘cut’

Ambiguities involving coronals

- Numerous types of verbs ending in liquids or coronal stops

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
lɨ irreg.	hɨ**ll**ə	hɨɾɨmyən	hɨɾɨda	‘flow’
lə irreg.	iɾ**ɨɾ**ə	iɾɨmyən	iɾɨda	‘reach’
t irreg.	ʃiɾə	ʃiɾɨmyən	ʃi(t)t’a	‘load’
	muɾə	muɾɨmyən	mu(t)t’a	‘ask’
l reg.	muɾə	mulmyən	mulda	‘bite’
lɨ reg.	t’aɾa	t’aɾɨmyən	t’aɾɨda	‘follow’
lh reg.	iɾə	iɾɨmyən	ilt^{h}a	‘lose’
llɨ reg.	tɨllə	tɨllɨmyən	tɨllɨda	‘drop by’

- Attested reanalyses

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
⇒ llɨ reg.	hɨ**ll**ə	hɨ**ɾ**ɨmyən ⇒ $^{☆}$hɨ**ll**ɨmyən	hɨ**ɾ**ɨda ⇒ $^{☆}$hɨ**ll**ɨda	‘flow’
⇒ lɨ reg.	iɾɨɾə	i**ɾ**ɨmyən ⇒ $^{☆}$i**ɾ**ɨ**ɾ**ɨmyən	iɾɨda ⇒ $^{☆}$i**ɾ**ɨ**ɾ**ɨda	‘reach’
⇒ lɨ reg.	tɨɾə	tɨɾɨmyən	tɨ(t)t’a ⇒ $^{☆}$tɨ**ɾ**ɨda	‘listen’
⇒ l reg.	muɾə	muɾɨmyən	mu(t)t’a ⇒ mu**l**da, mu**l**t’a	‘ask’
cf.	t’aɾa	t’aɾɨmyən	t’aɾɨda	‘follow’
	iɾə	iɾɨmyən	ilt^{h}a	‘lose’
	tɨllə	tɨllɨmyən	tɨllɨda	‘drop by’

‘p-irregular’ verbs

- Conservative forms

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
p-reg.	co**b**a	co**b**ɨmyən	co**p**t’a	‘be narrow’
	i**b**ə	i**b**ɨmyən	i**p**t’a	‘put on; get’
p-irreg.	to**w**a	to**u**myən	to**p**t’a	‘help’
	ki**w**ə	ki**u**myən	ki**p**t’a	‘patch’
	əɾyə**w**ə	əɾyə**u**myən	əɾyə**p**t’a	‘difficult’
u-reg.	ci**w**ə	ci**u**myən	ci**u**da	‘erase’
	se**w**ə	se**u**myən	se**u**da	‘place something’

- Reanalysis: p-irreg ⇒ u-reg

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
⇒ u-reg	towa	toumyən	to**p**t’a ⇒ *to**u**da	‘help’
cf.	ci**w**ə	ci**u**myən	ci**u**da	‘erase’

Ambiguities that have not led to reanalysis

- Coda neutralization, cluster simplification, nasalization

	-ə (IMPER)	-ɨmyən (COND)	-ta (DECL)	Gloss
Lax	co**b**a	co**b**ɨmyən	co**p**t’a	‘be narrow’
	mu**g**ə	mu**g**ɨmyən	mu**k**t’a	‘stay’
Asp	tə**pʰ**ə	tə**pʰ**ɨmyən	tə**p**t’a	‘cover’
Fortis	mu**k’**ə	mu**k’**ɨmyən	mukt’a	‘tie’
Cluster	ə**ps’**ə	ə**ps’**ɨmyən	ə**p**t’a	‘lack’
	ku**lg**ə	ku**lg**ɨmyən	ku**k**t’a	‘big, thick’

- In principle, could lead to restructuring (*təpt’a* ∼ *təpʰə* ⇒ **təbə*; *əpt’a* ∼ *əps’ə* ⇒ **əbə*)
- Such reanalyses are taking place in nouns (Kenstowicz, 1997; Ko, 2006) but not in verbs
- Various other potential but unattested reanalyses; see Kang (2006); Albright & Kang (2009)

Strikingly consistent directionality

- Vowel-final verbs acquire final laryngeals on basis of ambiguity in A-form
- Coronal-final verbs extend A-form, not C-form or i̵-form
- p-irregs become u-reg (like A-form/i̵-form), not p-reg (like C-form)
- Ambiguities caused by C-suffixes do not lead to reanalysis

Why this asymmetry?

- Hayes (1997): “Inside-Out Preference”
  - “phonological systems tend to organize themselves in ways that permit derived forms (such as the suffixed case forms of Yidiɲ) to be predicted from the base forms (usually, as in Yidiɲ, isolation forms).”
  - [ginda:n] ∼ [gindanu-CV] ‘moon’, [baba:l] ∼ [babala-CV] ‘bone’
- Dutch, Turkish follow this principle
- Spanish, Korean not inside→out
  - No containment relation
  - Need to say something about which form acts as ‘base’

Bases, UR’s

- Hayes frames inside-out preference in terms of ‘base’
  - Distinct, but related to morphological sense (‘base of affixation’)
  - Distinct from OT sense (base for Output-Output Faithfulness; Benua, 1997), but perhaps related?
- Hayes’s sense is closer to Underlying Representation
- So, the question about what information the base contains is similar or equivalent to the question of what the UR is
- …which we turn to on Monday

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