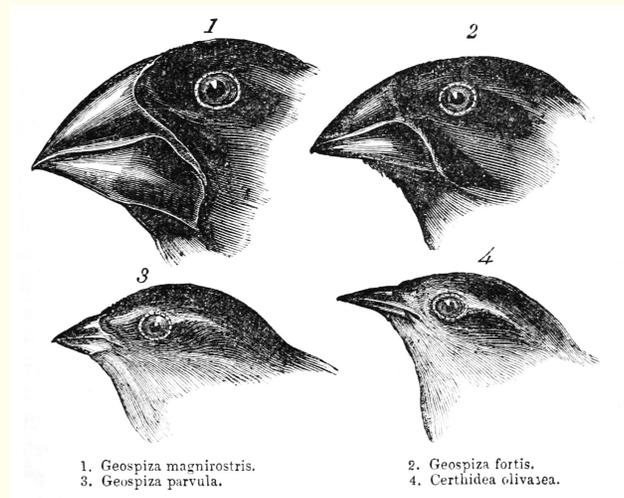


Evolutionary Phonology: Some Implications for Models of Grammar



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Evolutionary Phonology & Sound Change Typology

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Lecture I

What is Evolutionary Phonology?

Phonology

Phonology is traditionally defined as the study of sound patterns of the world's languages. These sound patterns include: contrastive sound inventories; patterns and domains of sound distribution; conditioned variants of sounds; and sound patterns as aspects of human cognition.

Descriptive phonological grammars

- Describe phonological contrasts
- Describe phonological categories
- Describe phonological combinations
- Describe phonological alternations

There is significant agreement in all of these areas.

Extra-descriptive phonological grammars

- May claim to explain sound patterns
- May posit phonological universals
- May posit abstract non-occurring sound patterns
- May claim description is psychologically real
- May make predictions about possible grammars
- May make predictions about learnability

There is significant disagreement in all of these areas.

One goal of Evolutionary Phonology

To summarize evidence from the diversity of phonological systems that may inform areas of disagreement in modeling phonological grammars, with special attention to the locus of explanation in phonological theory.

Some arguments in Evolutionary Phonology

I Arguments against

- phonological universals in grammar
- phonological markedness in grammar

II Arguments for

- language-specific phonology
- extra-grammatical explanations

Some substantive phonological universals

- Distinctive features
- The sonority scale
- The prosodic hierarchy

Distinctive feature theory

Distinctive features are the ultimate primitives in phonological representations. They define contrastive sound inventories, phonotactics, and alternations. They are universal aspects of phonological grammars because they are innate.

CHOMSKY AND HALLE 1968

Emergent feature theory

Distinctive features are language-specific learned properties of phonological systems. They are similar across languages because they emerge from generalizations across surface sound patterns which themselves tend to reflect aspects of universal phonetics.

Evidence for emergent feature theory

- There are many sound patterns that innate features cannot describe
- There is no evidence for innate features
- Generalizations about sound patterns are better treated with emergent features

MIELKE 2008, *pace* HALL 2010

A well studied sound pattern

A sound change in Balto-Slavic, Indo-Iranian

$*s > \int / \{r,u,K,i\}___$

K is any velar stop; $\int > x$ in Slavic, ξ in Old Indic

An alternation in Sanskrit

$s \rightarrow \xi / \{r,u,k,i\}___$

WHITNEY 1889, PEDERSEN 1895

An unnatural class ?

{r,u,K,i} is a not a natural class.

SPE [-anterior, -low] has been proposed for Sanskrit. Though /r/ triggers retroflexion, it is described as alveolar or cerebral, consistent with [+anterior]. Further, [-low] incorrectly includes /o/ in Balto-Slavic.

Post-SPE feature systems do not specify velar stops for [anterior] and /r/ is neither dorsal nor [+high].

ZWICKY 1970, VENNEMANN 1974

A phonetic hypothesis

The sounds {r,u,K,i} may constitute a natural class in terms of their acoustic effects on a following /s/ sound.

From an acoustic perspective, {r,u,K,i} may share the property of “lowering the frequencies of the energy concentration in a following s”

VENNEMANN 1974:95

Evidence for the phonetic hypothesis

Acoustic analysis of fricatives after {r,u,K,i} and non-{r,u,K,i} sounds supports the phonetic unity of this class of sounds. Fricatives after {r,u,K,i} have: (i) an initial concentration of fricative noise energy below 3500hz; (ii) lower continuous concentration of noise energy; and (iii) greater overall intensity of fricative noise spectra. Those after non-{r,u,K,i} do not.

LONGERICH 1998

An emergent feature

The {r,u,K,i} sound-change reflects acoustic properties of /s/ sounds when pronounced after {r,u,K,i} in old Indo-European dialects. The generalization that /r,u,k,i/ condition [ʃ] in Sanskrit is learned through generalizations over sound-meaning pairs. More generally, /r,u,K,i/ is an emergent natural class defined by the emergent feature associated with lowering the frequencies of a following /s/.

An unnatural class in Evenki

{v, s, g} → {m, n, ŋ} / [+nasal]__

/oron-vi/	oronmi	‘my reindeer’
/ŋinakin-si/	ŋinakinni	‘your dog’
/oron-gAtʃin/	oronŋotʃin	‘like a reindeer’
Cf.		
/amkin-du/	amkindu	‘bed-DAT’
/ekun-da/	ekunda	‘somebody, something’

Features in phonological grammars

If a phonological theory of grammar fails “to provide a mechanism for making distinctions between more or less natural classes of segments, this failure would be sufficient reason for rejecting the theory as being incapable of attaining the level of explanatory adequacy.”

CHOMSKY AND HALLE 1968:335

The Sonority Hierarchy

vowels > glides > liquids > nasals > obstruents

The sonority hierarchy is claimed to be a central organizing component of sound patterns, determining syllabification, syllable contact, and alternations. The sonority hierarchy is a universal aspect of phonological grammars because it is innate.

JESPERSEN 1904, PRINCE & SMOLENSKY 1993, PARKER 2002

The Sonority Hierarchy is real

- Tashlhiyt Berber syllabification [tɣznas] vs. [tzdmas]

DELL & ELMEDLAOUI 1985, 1988

- Perception experiments [mla] vs. [mda]

BERENT ET AL. 2009, BERENT 2013a, 2013b

- Silent reading experiments <mla> vs. <mda>

BERENT ET AL. 2009, BERENT 2013a, 2013b

- Loan cluster epenthesis [bilastik], [siwetar], [iski]

BROSELOW 1992, 2015; FLEISCHACKER 2000, 2005

- English rhymes roly-polly, loosey-goosey, willy-nilly,

COOPER & ROSS 1975, PINKER & BIRDSONG 1979, PARKER 2002

But is it phonological or phonetic?

vowels > glides > liquids > nasals > obstruents

Parker (2002) measured 5 correlates of sonority in Spanish and English: intensity, frequency of F1, total segment duration, peak intraoral air pressure, and combined oral plus nasal air flow. Intensity values yielded a correlation of at least .97 with typical sonority indices. He concludes that sonority is best defined in terms of a linear regression equation derived from the observed intensity results.

Sonority is real because intensity is real

- Tashlhiyt Berber syllabification [tχznas] vs. [tzdmas]

DELL & ELMEDLAOUI 1985, 1988

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BERENT ET AL. 2009, BERENT 2013a, 2013b

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COOPER & ROSS 1975, PINKER & BIRDSONG 1979, PARKER 2002

But phonological sonority is different

- Lexical syllabification: English [kɔldrɪn] vs. [læntɹɪn]

LADEFOGED 1975

- Sonority reversals: Russian [rtɑ] ‘mouth.gen’ vs. [tri] ‘three’

CLEMENTS 1990, MANN 2014

- Russian vs. English perception of [lba]: 1 or 2 syllables

BERENT ET AL. 2007

- Lebanese Arabic epenthesis: $l > N > r > S > T$

KENSTOWICZ 1994

- Variability in Modern Standard Arabic complex codas:
42% adhere to SSP; 49% reversals; 9% plateaus

TAMIMI & SHBOUL 2013

Phonological sonority

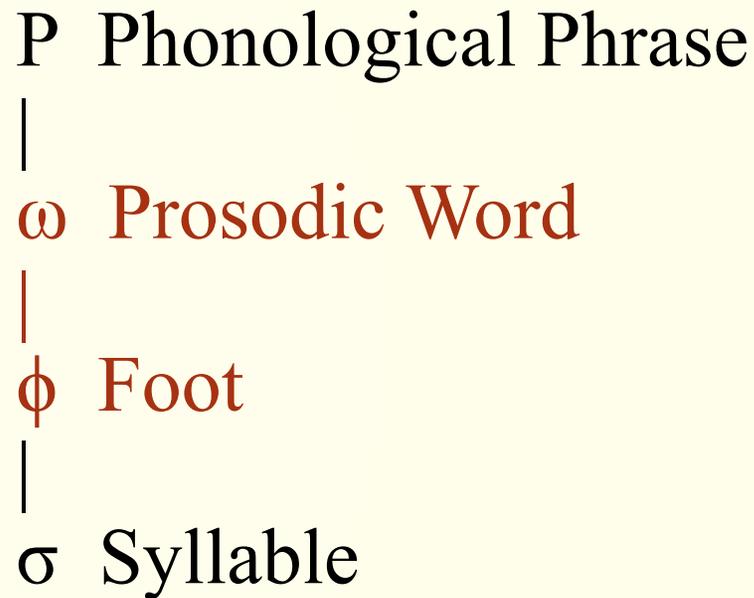
Phonological sonority scales are language-specific learned properties of phonological grammars. They are similar across languages because they emerge from generalizations across surface sound patterns which themselves tend to reflect aspects of universal phonetics, including phonetic sonority, a quantifiable measure of segmental intensity.

The Prosodic Hierarchy

Prosodic domains are universal fixed hierarchical categories in phonological representations. They define domains of contrast, phonotactics, and alternations. The prosodic hierarchy is a universal aspect of phonological grammars because it is innate.

SELKIRK 1981, 1984, 1986; NESPOR & VOGEL 1986

Middle of the Prosodic Hierarchy



- The set of categories is fixed and universal.
- No level can be skipped; there is strict layering.

The prosodic word is a foot

Minimal word is a minimal foot. Prosodic bulking may bring words to up to word-minimum.

MCCARTHY & PRINCE 1986

FTBIN and PW=FT

PRINCE & SMOLENSKY 1993

If degenerate σ_L feet are allowed, then sub-minimal σ_L words are allowed.

HAYES 1995

The prosodic word is not a foot

Language/Family	Foot-type	Minimal Word	reference
Chama Tacanan	trochees from end	CV	Key 1968
Warao Paezan	trochees from end	CV	Osborn 1966
Nengone Austronesian	trochees from end	CV	Tryon 1967a
Dehu Austronesian	trochees from start	CV	Tryon 1967b
Ono Western Huon	trochees from start	CV	Phinnemore 1985

There is no evidence of degenerate feet in any of these languages.

GARRETT 1999

Lurking between foot and word

Prosodic domains between word and foot are attested (Bickel et al. 2009), and, in rare cases, serve as prosodic templates.

In Iquito (Zaparoan), the minimal prosodic word is a foot, but the preferred word is a **colon** (= two feet), and the colon is the prosodic domain of metrical tone assignment. If lexical tone occurs within the final colon, no metrical tone is assigned; if it precedes the final colon metrical tone is assigned to the stressed syllable (Michael 2011).

Iquito colon as prosodic domain

- a. (,pi)('rú.su) 'electric eel'
- b. (,pi.ru)('sú.ka) 'electric eels'
- c. (,kí.pi)('ru.su) 'my electric eel'
- d. kíkí(,pi.ru)('sú.ka) 'my electric eels'
- e. kíkí(,pi.ru)(,su.ka)('há.ta) 'with my electric eels'

/kíkí-/ 'my' (lexical tone)
/pirusu/ 'electric eel' (toneless)

Lurking within the word

In Limbu (Sino-Tibetan), more than one distinct word domain is motivated between the foot and the phrase.

Major prosodic words are the domain of word stress and regressive coronal-to-labial place assimilation.

Minor prosodic words, which do not include prefixes, are the domain of medial onset $l \rightarrow r$, and $\emptyset \rightarrow ?/V_V$.

SCHIERING, BICKEL AND HILDEBRANT 2010

Missing levels of the hierarchy

In Vietnamese (Austroasiatic) nothing distinguishes monosyllabic lexical units from other syllables, and nothing distinguishes polysyllabic lexical units from polysyllabic phrasal strings. There is no evidence for a prosodic word in this language.

SCHIERING, BICKEL AND HILDEBRANT 2010

Language-specific prosodic domains

“As an alternative to the Prosodic Hierarchy framework, we advocate a heuristic for cross-linguistic comparison in which prosodic domains are conceived of as language-particular, intrinsic and highly specific properties of individual phonological rules or constraints. This allows us to explore empirically the actual degree of variation to be encountered across prosodic systems. It turns out that the ‘word’ has no privileged or universal status in phonology, but only emerges through frequent reference of sound patterns to a given construction type in a given language.”

SCHIERING, BICKEL AND HILDEBRANT 2010:657

Emergent prosodic domains

Prosodic domains are best viewed as language-specific learned properties of phonological systems. They are similar across languages because they emerge from generalizations across surface sound patterns which themselves tend to reflect aspects of universal phonetics, including phonetic sonority (σ), rhythm (ϕ), prominence (ω), and intonation contours (P).

Non-Universal Grammar: Interim summary

- **Distinctive features** and natural and unnatural classes are emergent properties of phonological grammars; they are learned and language-specific.
- **The sonority hierarchy** reflects phonetic sonority, a measure of acoustic intensity. Phonological sonority hierarchies are learned and language-specific, and may deviate from phonetic scales.
- The **prosodic word** is an emergent property of phonological grammars. Prosodic domains are not uniform across languages. They are learned and language-specific.

Lecture II

Natural and Unnatural Sound Patterns

Phonological markedness in grammar

- Ranking of segments and/or contrasts
e.g. $u > y$, $*D: >> *T:$
- Ranking of sequences and/or prosodic types
e.g. $.CV. > .V., .CVC. > .VC. (= ONSET)$
- Ranking of alternations or lexical relations
e.g. $he:p/he:bən >> he:b/he:bən, he:m/
he:bən, he:bə/he:bən, \text{etc. 'lift!/to lift'}$

A ranking may be between two or more elements/values.
A ranking may be context-free or context sensitive.

Central function of markedness

Common sound patterns tend to be phonetically natural sound patterns. Extra-descriptive grammars are formulated to incorporate some kind of phonetic naturalness **into the grammar**, usually by markedness constraints. Alternative approaches explain natural and unnatural sound patterns in terms of phonetic factors with no expression of phonological markedness within the grammar itself.

BLEVINS 2004, 2006, 2009, 2013

Correlates of phonological markedness

- Neutralization is to unmarked.
- Typologically, marked implies unmarked.
- Unmarked is more frequent than marked.
- Unmarked shows more phonetic variability than marked: it has more allophones and is more susceptible to assimilation
- Unmarked has more contrastive combinations than marked.
- Unmarked (within OT) emerges under epenthesis, reduplication, and other phonological operations that are not constrained by Faithfulness.

Coronals in consonant inventories

- Most spoken languages have /t/.
- Most spoken languages have /n/.
- Most spoken languages have at least one coronal stop that contrasts in place of articulation with another stop.

Typologically, coronal implies non-coronal, and is therefore considered the unmarked place of articulation

Coronals as unmarked consonants

Markedness in generative grammar PARADIS & PRUNET 1991

Coronal is the unmarked place of articulation.

Consonant Universal #4 HYMAN 2008

Every phonological system has coronal phonemes.

Markedness Hierarchies in OT PRINCE & SMOLENSKY 1993/2004

[dorsal] >>[labial]>>*[coronal]

Northwest Mekeo consonant inventory

	Labial	Palatal	Velar
Obstruents,			
voiceless	p		k
voiced	β		g
Nasals	m		ŋ
Glides	(w~o)	(j~ɛ)	

JONES 1995, 1998; BLEVINS 2009

Northwest Mekeo consonant allophones

/p/ a voiceless bilabial stop

/β/ a voiced bilabial fricative; the main (free) variants are [b] and [v]

/m/ a bilabial nasal continuant

/k/ a voiceless velar stop

/g/ a voiced velar stop; the main (conditioned) allophone is [dzʲ] before /i/.

/ŋ/ a velar nasal continuant with the occasional unconditioned variant [n]

/w/ a vocoid approximant freely intervarying with [o]

/j/ a palatal approximant (a glide) intervarying with [ɛ]

JONES 1998:559

Comparing Mekeo consonant inventories

NW MEKEO β p w/o g k m ŋ j/e

W MEKEO b p w g k m ŋ l

N MEKEO b f,w g,k m ŋ l

E MEKEO p f k ?/Ø m ŋ l

/t/, /d/, /s/, /n/ are absent in all varieties

Historical loss of coronals: *t > ø, *n > ŋ

Proto-Oceanic	Proto-Mekeo	NW	W	N	E
*taliŋa 'ear'	*aiŋa	aina	aina	aina	aina
*tama 'father'	*ama	ama	ama	ama	ama
*tanoq 'earth'	*aŋo	aŋo	aŋo	aŋo	aŋo
*tau 'person'	*au	au	au	au	au
*tina 'mother'	*iŋa	ina	ina	ina	ina
*mata 'eye'	*maa	ma	ma	maa	ma
*mate 'dead'	*mae	mae	mae	mae	mae
*kita 'see'	*ia	ia	ida	ija	isa

No coronals in Northwest Mekeo

- There are no coronal consonants in NW Mekeo; primary place contrast is labial vs. velar.
- There is no evidence that coronals are unmarked.
- The existence of velars and/or labials does not imply the existence of coronals.
- The Mekeo inventory type is rare, but it is not an impossible grammatical system.

Why do most languages have coronals?

- The tongue blade is an agile and speedy articulator
- Coronals like /t/ and /n/ are easy to produce
- Coronals contrast in more dimensions than other place features, including: manner (liquids!); place (anterior/non-anterior); sub-articulator (apical/laminal)
- Coronals are easy to distinguish from labials and velars
- Coronals are relatively stable in many contexts
- There are natural phonetic developments taking non-coronals to coronals, e.g. velar palatalization

There is significant agreement in all of these areas.

Phonetic explanations and grammar

Grammatical models with violable constraints can *describe* rare systems. If there is no /t/ or /n/ in the input, faithfulness to this input can persist.

But in order to *explain* the rarity of these systems, these models must resort to external explanations, or import external explanations into the grammar.

Phonetics inside phonological grammars

Why is /t/ common in sound inventories?

- P-maps encode perceptual distances between all segment pairs in all contexts STERIADE 2001, 2008
- *EFFORT expresses dispreference for physical effort involved in articulator movements. “The cost of violating this constraint is equal to the square of the magnitude of the transition, multiplied by a positive constraint weight.”
FLEMMING 2001, 2004

Problems for phonetics in grammar

- Does not capture classical observation that speakers are more sensitive to phonemic contrasts than allophonic contrasts.
- Duplicates explanation inside and outside the grammar in the form of physical properties of speech production and perception.
- Involves complex computations in evaluation of all possible phonetic contexts, contrasts, and/or articulations.

Universal tendencies in sound inventories

Universal tendencies in sound inventories can be explained **external** to the grammar in terms of segments and contrasts that are relatively easy to produce, relatively easy to perceive, and relatively stable in different phonetic contexts. Building these properties into phonological grammars appears misguided: there are strong tendencies but few absolutes; phonological categories may be compromised; duplication results; and grammars may become intractable.

Emergent inventories and modality

Under this approach, linguistic systems will tend to converge on segments and contrasts that are relatively easy to produce and perceive, and relatively stable in different contexts. This tendency is independent of the modality of the linguistic system and builds flexibility into the grammar.

DE BOER 2001; OUDEYER 2006; WEDEL 2011

Sign Language Inventories

All sign languages make use of the hands as articulators and contrast distinct handshapes. Most sign languages contrast:



Grammatical encoding of coronals as unmarked consonants in spoken languages makes no predictions regarding handshape in signed languages. Ease of articulation and perceptual contrast fare better.

Inventories: Implications for grammar

Categories and contrasts in phonological inventories that are extremely frequent or extremely rare can be explained in terms of grammar-external aspects of production and perception. While one can build these features into a grammar, there is no clear evidence that they are encoded in phonological grammars. Parallels in spoken and sign-language phonologies suggest modality-specific categories and contrasts resulting from similar external pressures.

The open syllable preference

“There are languages lacking syllables ...with final consonants, but there are no languages devoid of syllables ...with final vowels.” JAKOBSON 1962:526

“having only open syllables is preferred to not having only open syllables” VENNEMANN 1983:11-12

Syllable markedness PRINCE & SMOLENSKY 1993/2004

*CODA, NO-CODA A syllable must not have a coda

Open syllables are better than closed syllables

Aslian syllable and word structure

In some Aslian (Austroasiatic) languages, syllables with codas are preferred over syllables without codas word-finally.

In **Semai** (Central Aslian) most words fit a syllable template, where stress is always final:

$(C_3 V_2 (C_4)) \cdot C_1 V(:)_1 C_2$
minor **major**

Semai obligatory word-final codas

$(C_3 V_2 (C_4)) . C_1 V(:)_1 C_2$

minor

major

mat ‘eye’

li:p ‘to swallow’

pɔ:c ‘to wait’

məŋ ‘spider’

sɛc ‘flesh’

sə.lec ‘smooth’

mɑ.ni:ʔ ‘rain’

ŋ.ku:ʔ ‘thunder’

sɑ.mi:w ‘bear’

mər.gas ‘tiger’

kəl.ʔũ:p ‘brain’

The minor vowel V_2 is usually a short variable [ə], and less commonly short /a/, /i/ or /u/. It is never long.

Semai closed syllables are not heavy

$(C_3 V_2 (C_4)) . C_1 V(:)_1 C_2$
minor major

CV: is heavy

Long vowels cannot occur in minor syllables.

CVC is light

CVC is a possible minor syllable mər.gas ‘tiger’

Therefore, the preference for word-final codas in Semai cannot be attributed to a preference for heavy stressed syllables or the weight-to-stress principle.

Jahai obligatory word-final codas

In **Jahai** (Northern Aslian) most words fit a syllable template, where stress is always final:

$(C_3 V_2 (C_4)) . C_1 V_1 C_2$

minor

major

cɛp ‘to catch’

mit ‘eye’

moh ‘nose’

ros ‘liver’

kə.nec ‘comb’

ka.wip ‘sun bear’

təm.kal ‘male’

kal.ton̩ ‘knee’

Jahai obligatory word-final codas

Word-final syllables are always closed. This phonotactic is maintained in Malay loans:

Malay	Jahai	gloss
bunga	bunɛʔ	‘flower’
gula	guləh	‘sugar’
ubi	hobiʔ	‘tuber’
nasi	nasiʔ	‘cooked rice’
lata	lataʔ	‘waterfall’
pulau	puləw	‘island’
lantai	lantɛj	‘floor’

BURENHULT 2000, 2001

Preference for closed syllables in Aslian

- Many Aslian languages require word-final closed syllables.
- Codas are not weight units.
- This phonotactic pattern is not accidental: it is productive as evidenced in loans.
- A preference for closed syllables is rare, but it is not an impossible grammatical system.

Why do closed syllables imply open ones?

- CV (demi)syllables are articulatory and perceptual units
- C_1V (demi)syllables are components of C_1VC_2 syllables
- Production of C_1VC_2 includes production of C_1V
- Perception of C_1VC_2 includes perception of C_1V
- CV syllables occur in early babbling as a consequence of gross motor skills
- CV syllables are relatively stable in many contexts
- There are many natural phonetic developments taking closed syllables to open syllables

There is significant agreement in all of these areas.

Universal tendencies in phonotactics

Universal tendencies in phonotactics can be explained **external** to the grammar in terms of sequences of sounds that are relatively easy to produce, relatively easy to perceive, and relatively stable in different phonetic contexts. Building these properties into phonological grammars appears misguided: there are strong tendencies but few absolutes; *ad hoc* constraints are necessary when codas are obligatory; evolution of coda-less languages suggests language-specific priming.

BLEVINS 2004B, 2009

Emergent phonotactics and modality

Under this approach, linguistic systems will tend to converge on sequences of meaningless elements that are relatively easy to produce and perceive, and relatively stable in different contexts. This tendency is independent of the modality of the linguistic system and builds flexibility into the grammar.

DE BOER 2001; OUDEYER 2006; BLEVINS 2012

Sign Language Loco-tactics

Verbs with path movement (M) in sign languages use distinct locations $\{L_1, L_2\}$ to inflect for subject and object:

Handshape

/ | \

L_1 M L_2

Since a path goes from one location to another, L_1ML_2 is the norm. If LML is a syllable, all syllables have codas. NO-CODA does not carry over to signed languages.

SANDLER 1989, ARONOFF, MEIR & SANDLER 2005

Phonotactics: Implications for grammar

Phonotactic patterns can be explained in terms of grammar-external aspects of speech production and perception. While one can build these features into a grammar, there is no clear evidence that they are encoded in phonological grammars in the form of markedness constraints. Significant differences in sequential organization of spoken and sign-language phonologies suggest modality-specific patterns resulting from different external pressures when the hands are articulators in the visual signing space.

What are phonological grammars?

Phonological grammars are **not** instantiations of:

- A universal distinctive feature system
- A universal sonority hierarchy
- A universal prosodic hierarchy
- Universal markedness constraints that rank any of the above as more or less preferred

They appear to lack universal content.

What are phonological grammars?

Phonological grammars are instantiations of:

- Language-specific features and contrasts
- Language-specific segment inventories
- Language-specific syllable types
- Language-specific prosodic hierarchies
- Language-specific alternations

They resemble descriptive grammars

Phonological grammars may also be:

- Rich in phonetic detail
- Sensitive to sound pattern frequency
- Continuously changing
- Different across speakers
- Different across modalities, especially where learning is concerned

Phonetic detail in phonological grammars

- Incomplete neutralization

PORT ET AL. 1981, O'DELL 1985, KLEBER 2011, ETC.

- Use of fine phonetic detail in sound/word-recognition

HAWKINS 2003; HAWKINS & NGUYEN 2003, 2004

- Durational differences in high vs. low frequency words

BELL ET AL 2009, PLUMAEEKERS 2005, GAHL 2008

- Change across the lifespan

HARRINGTON ET AL. 2000; SANKOFF & BLONDEAU 2007

These facts are consistent with exemplar models of speech GAHL & YU 2006

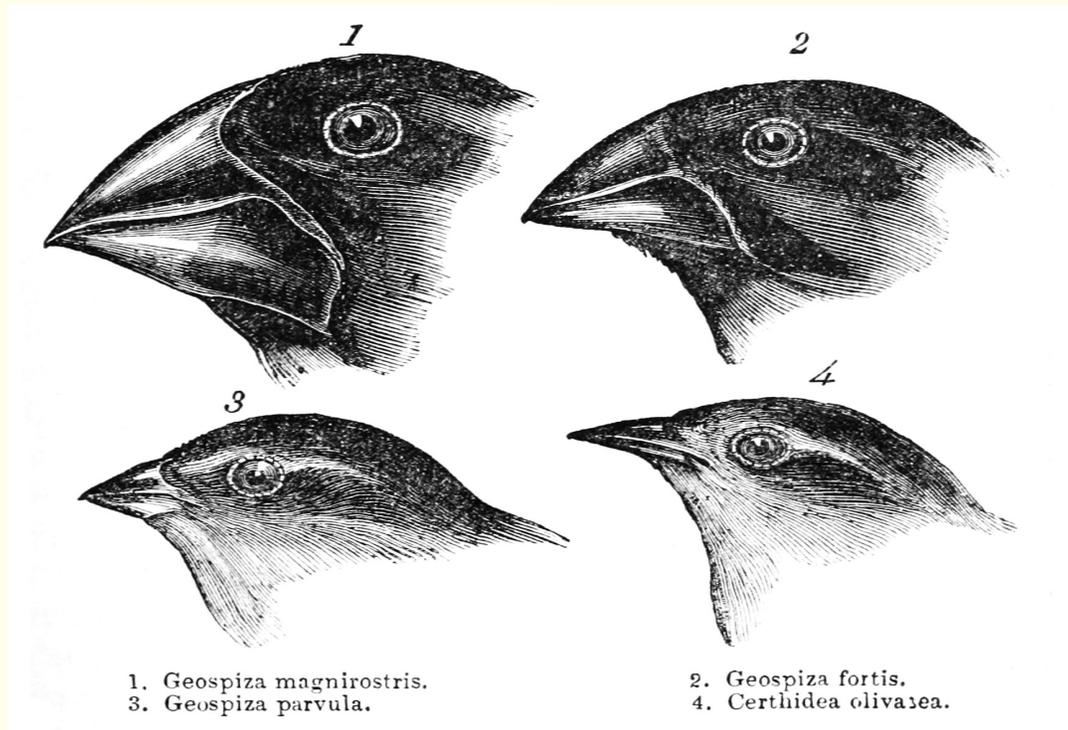
Conclusions

Phonological grammars of spoken languages encode language-specific categories, distributions and generalizations over related sounds. They are similar, in many ways, to descriptive grammars, but may also include phonetic detail. Phonological properties attributed to Universal Grammar and, therefore, to individual grammars, are more variable than once believed. External explanations for many of these properties yield phonological grammars devoid of universal content. This allows sign languages to inform our general conception of phonological grammars.

Diversity and grammar

Phonological diversity in spoken language is not limitless, since sounds are made by the human vocal tract, and interpreted by human ears. However, within the limits of production and perception, great variation is observed in contrasts, distributions, and alternations. On close inspection, this variation tells us more about local factors contributing to the evolution of these sound patterns than about any intrinsic aspects of the phonological systems themselves.

Merci beaucoup!



Thank you very much!

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Phonetic and phonological learning

Three aspects of spoken language make phonological learning complex and distinct from sign-language learning: (i) the majority of sound-meaning correspondences are arbitrary; (ii) the critical period for phonetic learning occurs prior to the end of the first year of life; and (iii) indelible phonological category learning stems from a linkage between sensory and motor experience where “sensory experience with a specific language establishes **auditory patterns stored in memory that are unique to that language**, and these representations guide infants’ successive motor approximations until a match is achieved”

KUHL 2010

Phonetic structure and neural commitment

Native language neural commitment is a term for the implicit learning process that begins before birth and commits the brain's neural circuitry to the properties of native-language speech. That neural commitment has bi-directional effects: it improves learning for sound patterns that are compatible with the learned phonetic structure, and decreases perception of nonnative patterns or categories that do not match the learned pattern.

KUHL 2004, 2010

Learning phonology without phonetics

The acquisition of sign language does not require storage of phonetically detailed auditory representations in the brain, nor the analysis of these within the first year which results in learning of language-specific phonological categories and sound patterns. Similarity of phonological categories across signed languages and the gross visual skills necessary to discern them may result in faster phonological learning past the critical age for spoken language phonology. Mimesis and iconicity in sign language may also speed lexical and grammatical acquisition.

How fast can phonology be learned?

International Sign language is used by the Deaf for communication at international events. It is structurally more complex than spoken pidgins, and has iconic and non-iconic signs, an extremely complex grammatical system, and a limited lexicon (Rosenstock 2004, Quinto-Pozos & Adam 2012). The phonology of this language is mobile, making use of handshapes from the signers' dominant language, contact languages, and conventional International Sign. Fast learning is legend, with training as short as 2-3 days. Could this fast learning reflect the liberation of phonology from auditory native-language neural commitment?

How is Evolutionary Phonology different?

- Attempts to explain recurrent sound patterns
- Attempts to explain sound pattern frequency
- Attempts to identify structural features that trigger or inhibit sound change
- Attempts to identify stable sound patterns
- Proposes testable hypotheses
- Makes no reference to phonological markedness
- Makes predictions in diachronic and synchronic domains, e.g. sub-theory of final devoicing