Locality and Iterativity in Jingulu Vowel Harmony

Rachel Walker
University of Southern California

Iterativity in Grammar Workshop
University of Leipzig
December 2, 2019

Introduction

Introduction

Iterativity

- In harmony systems, iterativity is often closely tied to locality and trigger-target relations
  - For example, in a string of multiple vowels that harmonize with a final vowel, the question arises as to what the trigger is for vowels at a distance from the final vowel. Two possibilities:
    - The trigger is always **adjacent** in the string, so that harmony is passed along in an **iterative** fashion.

    - The trigger is the **same** vowel for all segments, even if it is **non-adjacent**.

Introduction

Jingulu height harmony

- Height harmony in Jingulu engages these issues
  - Harmony in root vowels is initiated by a high suffix vowel.
  - However, high root vowels neither initiate nor transmit height harmony (Pensalfini 1997, 2002).
  - This pattern raises questions about trigger-target relations in the system, and whether harmony operates in a local, iterative fashion.

Introduction

Theoretical vantage point

- A positional licensing account is pursued (Walker 2005, 2011, Kaplan 2008a, b, 2011, 2015, Kalivoda 2012).
- Couched in an Agreement by Correspondence approach, where harmony is enforced over a chain of surface-corresponding vowels (Walker 2000a, b, 2001, Hansson 2001, 2010, Rose & Walker 2004).

Findings

- The analysis developed here shows that as a positional licensing phenomenon, Jingulu height harmony could be non-iterative.
- However, a requirement for a stable left anchor for the chain of surface-corresponding vowels drives harmony to persist until it reaches either a faithful vowel or an initial vowel.
- Harmony within the surface correspondence chain can be enforced strictly over chain-adjacent pairs.

Introduction

Road map

- Introduce Jingulu height harmony pattern
- Identify issues it raises involving iterativity and locality
- Develop positional-licensing analysis using ABC
- Stock-taking and discussion of alternatives.

Data

Height harmony in Jingulu

Jingulu: A language of North-Central Australia

- Three vowel phonemes: /i, a, u/
- Vowel height harmony from a high suffix vowel raises /a/ → [i] in a root.
  - Operates from /i, u/ in certain suffixes, usually unstressed
  - Harmony affects unbounded sequences of /a/ in a root (raised Vs are underlined).
  - Grammatical description and transcription based on Pensalfini (1997, 2002).

    Previous analyses by Nevins 2004, 2010, Kalivoda 2012

ng**a**rr**a**b**a**j**a** 'tell'	+/-w**u**rru-nu/ 3PL-DID	→	ng**i**rr**i**b**i**j**i**-w**u**rru-nu 'they told'
	+/-j**i**/ NEG.IMPV	→	ng**i**rr**i**b**i**j**i**-j**i** 'tell NEG.IMPV'

Pensalfini's orthographic conventions: <ng> velar nasal, <rr> alveolar rhotic, <rd> coronal retroflex stop, <rn> coronal retroflex nasal, <rl> coronal retroflex lateral, <r> coronal retroflex rhotic, <j> palatal stop, <ny> palatal nasal, <ly> palatal lateral, <y> palatal glide.

Height harmony in Jingulu

Further examples: Height harmony is triggered high vowels in by various suffixes

- Gender morphemes and certain tense/agreement/aspect morphemes.
- Triggering suffixes immediately follow the root.
- Pensalfini analyzes triggering suffixes as inflectional syntactic heads.

b**a**rd**a**rd**a** 'younger brother'	+ /-rn**i**/ F	→	b**i**rd**i**rd**i**-rn**i** 'younger sister'
bib**a** 'son'	+ /-rn**i**/ F	→	bib**i**-rn**i** 'daughter'
kuny**a**rrb**a** 'dog'	+ /-rn**i**/ F	→	kuny**i**rrb**i**-rn**i** 'bitch'
ng**a**j**a** 'see'	+ /-ng**u**rru-ju/ 1.PL.INCL-DO	→	ng**i**j**i**-ng**u**rru-ju 'we can see'
	+ /k**u**nyi-ju/ 2.DUAL-DO	→	ng**i**j**i**-k**u**nyi-ju 'you two can see'

Height harmony in Jingulu

Underlying high root vowels:

- Do not trigger harmony in either direction (left column)
- Halt height harmony (right column)

mam**a**mb**i**y**a**ka 'soft'	mam**a**mb**i**y**i**k**i**-m**i** 'soft VEG'
ank**i**l**a** 'cross cousin'	**a**nk**i**l**i**-rn**i** 'female cross cousin '
ng**a**m**u**rl**a** 'big'	ng**a**m**u**rl**i**-rn**i** 'big F '
warl**a**k**u** 'dog'	warl**a**k**u**-rn**i** 'bitch'

Height harmony in Jingulu

Low vowels in suffixes:

- The characteristic ending for the masculine gender is /-a/
- Low suffix vowels do not trigger height assimilation, i.e. lowering

bin**i**nj-**a** man-M	bardak**u**rr-**a** good-M	'good man M'

- Nor do they trigger raising, as gender suffixes with a high vowel do

jab**a**rrk-**a**	'liver M'
kiyin**a**rr-**a**	'vagina, vulva M'

Height harmony in Jingulu

Summary

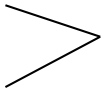
- Height harmony is triggered by high vowels in certain suffixes, affecting unbounded sequences of low vowels in adjacent syllables of a preceding root.
- Underlying high root vowels do not trigger or propagate height harmony.
- The harmony has a **phonological component**, because only high vowels are triggers.

Height harmony in Jingulu

Iterativity and locality

- Jingulu height harmony is **iterative** and **local** in the sense that it can affect unbounded sequences of vowels in contiguous syllables.
- Nevertheless, because high root vowels do not trigger or propagate harmony, the process **appears to be long-distance** rather than an iterative local process in the sense that a single suffix vowel triggers raising in all preceding vowels.

• Local • Identity enforced over vowels in adjacent syllables	birdirdi-rni
• Long-distance • Identity enforced with a single vowel	birdirdi-rni



?

Height harmony in Jingulu

Iterativity and locality

- Jingulu height harmony is **iterative** and **local** in the sense that it can affect unbounded sequences of vowels in contiguous syllables.
- Nevertheless, because high root vowels do not trigger or propagate harmony, the process **appears to be long-distance** rather than an iterative local process in the sense that a single suffix vowel seems to be the trigger for all raised vowels.

• Local • Identity enforced over vowels in adjacent syllables	birdirdi-rni
• Long-distance • Identity enforced with a single vowel	birdirdi-rni

This study pursues an approach in which Jingulu raising harmony is understood in terms of local chained identity relations

Analysis

Analysis

Aims for analysis

- Focus on phonological mechanisms that give rise to height harmony In Jingulu.
- Pursue an **Agreement by Correspondence (ABC)** approach

Positional licensing

- Positional licensing patterns involve an imperative that drives a licensing relation between a weak trigger and a prominent position in the word (Walker 2005, 2011, 2016, Kaplan 2008a, b, 2011, 2015).
- Jingulu height harmony can be understood as a **weak trigger** pattern (Kalivoda 2012).
  - Weak trigger – Affixal high vowel; Licensor – Root
- In the interests of focus
  - Preservation of height in the weak vowel at the cost of faithfulness in the root will not be treated here. (On approaches to weak trigger control, see Walker 2005, 2011.)
  - The morpho-syntactic issues will not be probed further.

Analysis

Why ABC?

- Surface correspondence provides a means of enforcing agreement and disagreement among segments in an output.
- Originating studies focused on consonant harmony (Walker 2000a, b, 2001, Hansson 2001, 2010, Rose & Walker 2004).
- Surface correspondence has since been applied to a range of phenomena
  - exx. vowel harmony, dissimilation, tone assimilation, vowel nasalization harmony, reduplication, consonant-tone interactions, restrictions on nasal-consonant sequences, among others (see Shih & Inkelas 2014).
- ABC has been expanded into analysis of vowel harmony systems, but its treatment of weak trigger patterns remains to be examined (e.g. Bowman & Lokshin 2014, Hansson 2006a, Sasa 2009, Rhodes 2012, Walker 2015, 2018, cf. Baković 2000, Krämer 2003).
- Jingulu is an interesting test case, because a single suffix vowel appears to trigger harmony in multiple preceding vowels, even at a distance.
- ABC has potential to shed light on locality and iterativity in this system.

Analysis

Basic elements of ABC

- **Surface correspondence driver**:
  - **CORR-XX[αF]** constraints enforce correspondence among segments in an output that are specified [αF] (e.g. [+vocalic] or [-son, -cont]).
- **Surface identity driver**:
  - **IDENT-XX[F]** constraints enforce identity for a feature [F] in surface-corresponding segments.
- **Faith-IO**:
  - **IDENT-IO[F]** constraints enforce identity for a feature [F] in input-output correspondents.
- Agreement by correspondence occurs when constraints that drive surface correspondence and surface identity both dominate Faith-IO

  CORR-XX[αF], IDENT-XX[F] >> IDENT-IO[F]

Analysis

Locality and transitivity in ABC

- **Local assessment** of drivers of identity for surface correspondents (IDENT-XX[F])
  - A violation is assigned for every pair of segments that are adjacent in the surface-correspondence chain that are not identical in specification for [F] (Hansson 2006b, 2007; see also Krämer 2003).
  - Hansson argues that local evaluation of IDENT-XX avoids problematic predictions regarding majority rule effects and indeterminacy of triggers.

    (cf. McMullin 2016, Hansson & McMullin 2019 for further discussion of long-distance dependencies in relation to ABC.)
- Surface correspondence relations are **transitive** (Bennett 2015b).
  - If $X_1 \mathcal{R} X_2$ and $X_2 \mathcal{R} X_3$, then $X_1 \mathcal{R} X_3$.

Analysis

Illustration

- Local evaluation of identity in surface correspondence chains

/ s … z … ʃ /	IDENT-XX[anterior]	Notes
a. / s_x … z_x … $ʃ_x$ /	*(z ~ ʃ)	*All fricatives correspond with each other*
b. / s_x … z_y … $ʃ_x$ /	*(s ~ ʃ)	*Only* [s] and [ʃ] correspond with each other

- IDENT-XX[ant] assigns violations for ***chain-adjacent*** pairs of segments that differ in specification for [anterior]
  - No violation for [s_x] ~ [$ʃ_x$] in (a), because they are not chain-adjacent.
  - Note that because [z] corresponds with both flanking fricatives in (a), [s] ~ [ʃ] will nonetheless correspond due to transitivity of surface correspondence.
  - In (b) [s_x] ~ [$ʃ_x$] are chain adjacent, so they incur a violation.

Analysis

Question

- If identity for surface correspondents is enforced locally, i.e. over chain-adjacent pairs, why do low root vowels in Jingulu show iterative raising?
  - The suffix vowel will be chain-adjacent with only one root vowel.
  - And (underlying) high root vowels do not trigger raising.

Illustration

- The vowels in [bi**b**i-rn**i**] 'daughter' will form a correspondence chain: [i_x i_x - i_x].
- The first root vowel is chain-adjacent with the second root vowel, but not the suffix vowel.
  - The first root vowel must therefore raise by virtue of identity enforced with the second root vowel.
- But this is puzzling, because (underlying) high root vowels block harmony.

Analysis

Elaborating CORR constraints for positional licensing

- Weak trigger effects using CORR-XX[αF](Licensee, Licensor)
- Introduces potential restrictors on correspondents based in weakness (licensee) and positional strength (licensor).

CORR-XX[+vocalic]([+high]$_{Af\text{-}Infl_0}$, Root) **Short form CORR-VV([+hi]$_{Af}$, Rt)**

Let X_1 be [+voc, +high] and belong to an affixal $Infl_0$.

Then assign a violation if there is not a surface correspondence relation between X_1 and some X_2 such that:

X_2 is [+vocalic] segment and belongs to a root.

(Infl restriction on X1 after Pensalfini 2002 and licensing proposal by Kalivoda 2012)

- This constraint can be satisfied by non-iterative or iterative height harmony in the root. In fact, harmony persists for reasons to be addressed shortly.

Analysis

Overview for ABC licensing approach for Jingulu

- Licensing between affix and root
  - Driven by a CORR-XX constraint
  - **Can be satisfied by a single (noniterative) surface correspondence relation.**

… i_x-i_x

- Further constraints governing correspondence chains
  - Prohibit correspondence chains with a leftmost vowel that is neither initial nor faithful.
  - Prevent a correspondence chain that gaps across a syllable.
  - **Produce the effect of iterative surface correspondence with locally enforced identity** that terminates in a faithful high root vowel (a) or an initial syllable (b).

(a) /ankila-mi/
$a_y$nki$_x$li$_x$-mi$_x$

(b) /bardarda-rni/
bi$_x$rdi$_x$rdi$_x$-rni$_x$

Analysis

Constraints

- **CORR-VV([+hi]$_{Af}$, Rt)**
  - Licensing imperative for raising harmony that targets a root vowel.
- **IDENT-XX[high]**
  - Let X_1 and X_2 be a pair of segments that are in correspondence with each other in the same output and that are chain-adjacent. If X_1 is [αhigh] and X_2 is [-αhigh], assign a violation.
- **IDENT-IO[high]**
  - Let X be a segment in the input and Y be a correspondent of X in the output. If X is [αhigh] and Y is [-αhigh], assign a violation.
- **SYLLADJ-XX**
  - Segments belonging to the same correspondence chain must occupy a contiguous span of syllables (Bennett 2015b).

Analysis

Observation

- Vocalic correspondence chains for height harmony in Jingulu begin with either a faithful vowel or a vowel in the stem-initial syllable.
- Both such positions could be considered stable (salient) contexts to anchor the beginning of a correspondence chain.
  - A faithful vowel is privileged because it is consistent with the stored lexical representation.
  - Initial syllables are prominent in speech planning, possibly receiving a higher level of activation (see Walker 2011 for a review).
  - Vowels in initial syllables undergo domain-initial strengthening in some languages (Barnes 2006).

Analysis

Proposal: Stable anchoring

- There is an imperative for correspondence chains to begin with a stable anchor.

ANCHOR(XX, Stb, L) Henceforth **STABLE-ANCHOR-XX-L**
Let Stb be a set of stable anchors {IO-faithful, σ_1}
Assign a violation if the leftmost element in a surface correspondence chain is not an element of Stb, i.e. a stable anchor.
(cf. ANCHOR formalism of McCarthy 2003 and CC-ANCHOR-R proposed by Bennett 2015b.)

- The set of stable anchors might vary to some extent by language, although it is expected to be limited.
- Whether left-edge faithfulness is enforced monolithically or is restricted to faithfulness for a specific feature, remains an open question.

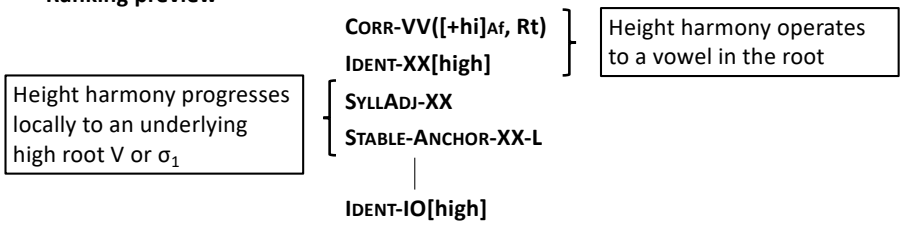
Analysis

Illustration: Various surface correspondence structures for /mamambiyaka-mi/ 'soft VEG'

/mamambiyaka-mi/	Comments
a. $a_3\ a_2\ i_{\mathbf{1}}\ i_{\mathbf{1}}\ i_{\mathbf{1}} – i_{\mathbf{1}}$ [mamambiyikimi]	**Optimal output.** Satisfies root-licensing constraint. Also satisfies STABLE-ANCHOR because leftmost V in chain '1' is faithful for [high].
b. $a_5\ a_4\ i_3\ a_2\ i_{\mathbf{1}} – i_{\mathbf{1}}$ [mamambiyakimi]	Satisfies root-licensing constraint with one less IDENT-IO[high] violation than (a) but violates STABLE-ANCHOR.
c. $a_4\ a_3\ i_2\ i_{\mathbf{1}}\ i_{\mathbf{1}} – i_{\mathbf{1}}$ [mamambiyikimi]	Same markedness violations as (b) but with one more IDENT-IO[high] violation.
d. $i_{\mathbf{1}}\ i_{\mathbf{1}}\ i_{\mathbf{1}}\ i_{\mathbf{1}}\ i_{\mathbf{1}} – i_{\mathbf{1}}$ [mimimbiyikimi]	Ties with (a) in satisfying root-licensing constraint and STABLE-ANCHOR (here, leftmost V in chain '1' is initial) but with two more IDENT-IO[high] violations.
e. $a_5\ a_4\ i_{\mathbf{1}}\ a_3\ a_2 – i_{\mathbf{1}}$ [mamambiyakami]	Ties with (a) in satisfying root-licensing constraint and STABLE-ANCHOR. Earns two less IDENT-IO[high] violations but violates SYLLADJ-XX.
f. $a_6\ a_5\ i_4\ a_3\ a_2 – i_{\mathbf{1}}$ [mamambiyakami]	Violates root-licensing constraint because affix vowel has no surface correspondent in the root.

Analysis

Ranking preview



- Root licensing **activates** STABLE-ANCHOR-XX-L
  - When root licensing causes a root-final vowel to be unfaithful, **STABLE-ANCHOR** drives extension of the correspondence chain to a stable anchor.
- High root vowels are ***icy targets*** (Jurgec 2011a, b)
  - An icy target participates in harmony but "freezes" propagation beyond it.
  - Emerges here as the effect of the left anchoring constraint.

Analysis: Height harmony in a root with an underlying high vowel (iterative to icy target)

Comments	/mamambiyaka-mi/	CORR-VV ([+hi]Af, Rt)	IDENT-XX [high]	SYLLADJ -XX	STABLE-ANCHOR -XX-L	IDENT-IO [high]
Harmony up to and including root /i/	a. → $a_3\ a_2\ i_1\ i_1\ i_1 – i_1$ [mamambiyikimi]					**
Harmony to root-final /a/	b. $a_5\ a_4\ i_3\ a_2\ i_1 – i_1$ [mamambiyakimi]				*! W	* L
Harmony up to vowel before root /i/	c. $a_4\ a_3\ i_2\ i_1\ i_1 – i_1$ [mamambiyikimi]				*! W	**
Harmony to initial /a/, through root /i/	d. $i_1\ i_1\ i_1\ i_1\ i_1 – i_1$ [mimimbiyikimi]					***!* W
Harmony with root /i/ only	e. $a_5\ a_4\ i_1\ a_3\ a_2 – i_1$ [mamambiyakami]			*! W		L
No harmony	f. $a_6\ a_5\ i_4\ a_3\ a_2 – i_1$ [mamambiyakami]	*! W				L
Height identity not enforced in corresponding Vs	g. $a_6\ a_5\ i_1\ a_1\ a_1 – i_1$ [mamambiyakami]		*!* W (i~a, a~i)			L

Analysis: Height harmony in a root with no underlying high vowel (iterative)

Comments	/bardarda-rni/	CORR-VV ([+hi]Af, Rt)	IDENT-XX [high]	SYLLADJ -XX	STABLE-ANCHOR -XX-L	IDENT-IO [high]
Harmony fully throughout root	a. → $i_1\ i_1\ i_1 – i_1$ [birdirdirni]					***
Harmony to root-final /a/ only	b. $a_3\ a_2\ i_1 – i_1$ [bardardirni]				*! W	* L
Harmony up to root-medial /a/	c. $a_3\ i_1\ i_1 – i_1$ [bardirdirni]				*! W	**L
Harmony with root-initial /a/ only	d. $i_1\ a_3\ a_2 – i_1$ [birdardarni]			*! W		* L
No harmony	e. $a_4\ a_3\ a_2 – i_1$ [bardardarni]	*! W				L
Height identity not enforced in corresponding Vs	f. $a_1\ a_1\ a_1 – i_1$ [bardardarni]		*! W (a ~ i)			L

Analysis: Height harmony in a root with a final underlying high vowel (non-iterative)

Comments	/warlaku-rni/	CORR-VV ([+hi]Af, Rt)	IDENT-XX [high]	SYLLADJ-XX	STABLE-ANCHOR -XX-L	IDENT-IO [high]
Harmony to root-final /u/	a. → $a_3\ a_2\ u_1 – i_1$ [warlakurni]					
No harmony	b. $a_4\ a_3\ u_2 – i_1$ [warlakurni]	*! W				
Harmony through /u/ to initial /a/	c. $i_1\ i_1\ u_1 – i_1$ [wirlikurni]					*!* W

Analysis

Summary

- On this account, Jingulu height harmony is understood as driven by a positional licensing imperative such that
  - Agreement by Correspondence is strictly enforced between a [+high] suffix vowel and a root vowel.
  - Raising of a root-final vowel activates a stable anchoring constraint governing a correspondence chain, requiring a faithful or initial leftmost element.
  - Result:
    - Harmony operates to an underlying high vowel.
    - If an underlying high root vowel is not reached, harmony operates to the initial syllable.
- In the correspondence chain, there are no gaps across syllables and identity for [high] is assessed locally over chain-adjacent vowels.

Alternatives

Alternative: Relational correspondence

Relational correspondence

- Preservation of plateau or contour relations between input values for segmental features and tones via ***contour correspondence constraints*** (Steriade 2012).
- Example of a contour correspondence constraint:

  CONTOURCORR-IO(height, plateau)

  If two vowels in contiguous syllables have identical values for height in the input, those vowels have height values that are identical to each other in the output.
- Prediction
  - Plateau preservation predicts across-the-board shifts in height for a sequence of vowels with the same height in the input.

Alternative: Relational correspondence

Applied to Jingulu height harmony

- A root-licensing constraint for [+high] would minimally compel raising in a root-final vowel.
- To preserve a plateau, CONTOURCORR-IO(height, plateau) would drive raising of the maximal contiguous sequence of underlying low vowels that contains the raised vowel (cf. Kalivoda 2012 on FAITH-SHARE).

Alternative: Relational correspondence

Comparison with ABC

- Relational correspondence (RC) employs a more powerful evaluation of identity than ABC.
  - ABC evaluates identity between segmental pairs in IO and XX correspondence.
  - RC additionally examines **sequences in the input**, and it compares the **identity of relations** across input and output sequences.

ABC identity evaluations		RC identity evaluations	
Input	a a	Input	a ↔ a
	↕ ↕		↕ ↕
Output	i_x ↔ i_x	Output	i_x ↔ i_x
IDENT-IO	a ~ i, a ~ i	IDENT-IO	a ~ i, a ~ i
IDENT-XX	i ~ i	RC-identity	$(a \sim a)_I \sim (i \sim i)_O$

Alternative: Needy root vowels

- Root vowels that potentially raise are lexically marked as requiring harmony for [high]; non-alternating root vowels are lexically [+high].
- A morphological condition restricts the harmony source to a non-root.
- If a needy V fails to find a source, it is assigned default [–high] (Nevins 2004, 2010).

ABC Licensing approach	Needy root vowels
Dependency operates from suffix vowel to root	Dependency operates from root vowels to suffix
Harmony is enforced via over chain-adjacent vowels over a contiguous span of syllables	Harmony is enforced iteratively from the leftmost (furthest) harmonizing root vowel to the suffix vowel
High vowels are icy targets – they terminate harmony because of their status as faithful	High vowels block harmony through defective intervention – they do not meet the morphological condition on a harmony source
Single input-output derivational step	Serial derivation

Conclusion

Conclusion

Jingulu height harmony

- A harmony pattern intersecting with several interesting issues, including locality, iterativity, triggering, and the nature of participation by blockers.

Some take-aways from the proposed account

- A weak trigger analysis implemented within an ABC approach.
- An imperative for [+high] vowels in certain affixes to be licensed by correspondence with the root drives minimal (non-iterative) harmony to the root-final vowel.
- Root-licensing can disrupt a stable left-anchor for a correspondence chain, which drives height harmony to persist until it reaches a faithful high vowel or an initial vowel.
- Even though the weak trigger is not adjacent to all harmonizing vowels, identity is assessed strictly over chain-adjacent vowel pairs.

Further research

Positional licensing in an ABC approach

- The suitability of an ABC approach to positional licensing remains to be explored further.
- Positional licensing phenomena depart from patterns that are classically analyzed using ABC because they are not usually characterized as similarity sensitive.
- In an ABC treatment of positional licensing, it is the licensee/licensor pairing that gives rise to surface correspondence.

Anchoring

- In another vein, further work is need to pursue the implications of edge-anchoring constraints on surface correspondence chains.

References

Baković, Eric. 2000. *Harmony, Dominance and Control.* PhD dissertation, Rutgers University.

Barnes, Jonathan. 2006. *Strength and Weakness at the Interface: Phonological Neutralization in Phonetics and Phonology*. Berlin: Mouton de Gryuter.

Bennett, William G. 2013. *Dissimilation, Consonant Harmony, and Surface Correspondence*. PhD dissertation, Rutgers University.

Bennett, William G. 2015a. Assimilation, dissimilation, and surface correspondence in Sundanese. *Natural Language & Linguistic Theory* 33, 371–415.

Bennett, William G. 2015b. *The Phonology of Consonants*. Cambridge: Cambridge University Press.

Bowman, Samuel R. & Benjamin Lokshin. 2014. Idiosyncratically transparent vowels in Kazakh. *Proceedings of the Annual Meeting on Phonology 2013*.

Hansson, Gunnar Ó. 2001. *Theoretical and Typological Issues in Consonant Harmony*. PhD Dissertation, UC Berkeley.

Hansson, Gunnar. Ó. 2006a. Locality and similarity in phonological agreement. Paper presented at the PhonologyFest Workshop, Indiana University, Bloomington, June 23, 2006.

Hansson, Gunnar Ó. 2006b. Understanding harmony as agreement. Paper presented at the annual meeting of the Linguistic Society of America, Albuquerque, NM, January 5-8 2006.

Hansson, Gunnar Ó. 2007. Blocking effects in agreement by correspondence. *LI* 38, 395-409.

Hansson, Gunnar Ó. 2010. *Consonant Harmony: Long-Distance Interaction in Phonology*. Berkeley: University of California Press.

Jurgec, Peter. 2011a. *Feature Spreading 2.0: A Unified Theory of Assimilation*. PhD dissertation, University of Tromsø.

Jurgec, Peter. 2011b. Icy targets. Ms., Meertens Instituut.

Kalivoda, Nick. 2012. Jingulu vowel harmony as weak-trigger licensing. *UGA Working Papers in Linguistics* 1.

Kaplan, Aaron. 2008a. Noniterativity is an Emergent Property of Grammar. PhD dissertation, University of California, Santa Cruz.

Kaplan, Aaron. 2008a. Licensing and noniterative harmony in Lango. *NELS* 37, 311–322.

Kaplan, Aaron. 2011. Gradualness and harmonic improvement without candidate chains in Chamorro. *Linguistic Inquiry* 42, 631–650.

Kaplan, Aaron. 2015. Maximal prominence and a theory of possible licensors. *Natural Language and Linguistic Theory* 33, 1235-1270.

Krämer, Martin. 2003. *Vowel Harmony and Correspondence Theory.* Berlin: Mouton de Gruyter.

McCarthy, John J. 2003. OT constraints are categorical. *Phonology* 20, 75–138.

McMullin, Kevin. 2016. *Tier-based locality in Long-distance Phonotactics: Learnability and Typology*. PhD dissertation, University of California, Berkeley.

McMullin, Kevin &, Gunnar Ó Hansson. 2019. Inductive learning of locality relations in segmental phonology. Laboratory Phonology: Journal of the Association for Laboratory Phonology 10(1), 14, 1–53.

Nevins, Andrew. 2004. *Conditions on (Dis)Harmony*. PhD dissertation, MIT.

Nevins, Andrew. 2010. *Locality in Vowel Harmony*. Cambridge, MA: MIT Press.

Pensalfini, Robert. 1997. *Jingulu Grammar, Dictionary, and Texts*. PhD dissertation, MIT.

Pensalfini, Robert. 2002. Vowel harmony in Jingulu. *Lingua* 112, 561-586.

Rhodes, Russell. 2012. Vowel harmony as Agreement by Correspondence. *UC Berkeley Phonology Lab Annual Report*, 138–168. University of California, Berkeley.

Rose, Sharon & Rachel Walker. 2004. A typology of consonant agreement as correspondence. *Language* 80, 475–531.

Sasa, Tomomasa. 2009. *Treatments of Vowel Harmony in Optimality Theory*. PhD dissertation, University of Iowa.

Shih, Stephanie S. & Sharon Inkelas (eds). 2014. Agreement by correspondence archive & bibliography. http://linguistics.berkeley.edu/phonlab/annual_report/documents/2014/annual_report_2014_ABCC.html

Steriade, Donca, 2012. Contour correspondence: Tonal and segmental evidence. Paper presented at Universitat Autònoma de Barcelona, March 20, 2012.

Walker, Rachel. 2000a. Long-distance consonantal identity effects. *WCCFL 19,* 532–545.

Walker, Rachel. 2000b. Yaka nasal harmony: Spreading or segmental correspondence? *BLS 26,* 321–332.
Walker, Rachel. 2001. Consonantal correspondence. In R. Kirchner, J. Pater & W. Wikeley, eds., *Proceedings of the Workshop on the Lexicon in Phonetics and Phonology*, 73-84. Papers in Experimental and Theoretical Linguistics 6. University of Alberta, Department of Linguistics.
Walker, Rachel. 2005. Weak triggers in vowel harmony. *Natural Language and Linguistic Theory* 23, 917–989.
Walker, Rachel. 2010. One-to-many relations. Presentation at the Manchester Phonology Meeting, May 20-22, 2010, University of Manchester, UK.
Walker, Rachel. 2011. *Vowel Patterns in Language*. Cambridge, UK: Cambridge University Press.
Walker, Rachel. 2015. Surface correspondence and discrete harmony triggers. *Proceedings of the Annual Meeting in Phonology 2014*.
Walker, Rachel. 2016. Positional prominence and consonantal interactions in metaphony and post-tonic harmony. In Francesc Torres-Tamarit, Kathrin Linke & Marc van Oostendorp, eds. *Approaches to Metaphony in the Languages of Italy*, 301–332. Berlin: de Gruyter.
Walker, Rachel. 2018. Feature identity and icy targets in Menominee vowel harmony. *Hana-bana: A Festschrift for Junko Itô and Armin Mester*, ed. by Ryan Bennett, Andrew Angeles, Adrian Brasoveanu, Dhyana Buckley, Shigeto Kawahara, Grant McGuire & Jaye Padgett. Department of Linguistics, University of California, Santa Cruz. https://itomestercelebration.sites.ucsc.edu/