Dissimilation by Correspondence in Sundanese

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1. Background and project

The Agreement-By-Correspondence framework (='ABC') is a theory of agreement developed (by Walker 2000a,b, Hansson 2001, and especially Rose & Walker 2004) to explain long-distance consonant harmony: patterns where non-adjacent consonants agree with each other, but do not interact with the other material that intervenes between them. In ABC, the basis for this agreement is Surface Correspondence ('SCorr'): correspondence relationships that hold between different consonants of the same output form. The arrangement of these correspondences affects the input-output mapping because there are constraints that take them into consideration when assessing violations.

Three types of constraints assess violations based on surface correspondences, and they play distinct roles in ABC analyses of consonant harmony. First, there are the CORR constraints, which assign violations when output consonants with some shared feature(s) are not in surface correspondence with each other. Their role is requiring certain consonants to correspond with each other, thereby picking out the class of interacting consonants in a harmony pattern. Next, there are the CC-IDENT constraints. These constraints assign violations when consonants that are in surface correspondence with each other disagree in some feature(s). They demand featural agreement among correspondents, which provides the impetus for long-distance assimilation. Finally, there are Structural SCorr constraints; they assign violations for correspondence between consonants that are in some particular morphological or prosodic configuration. In a harmony system, these constraints limit the extent of agreement, by allowing correspondence only under certain conditions.

The interaction of CORR, CC-IDENT, and Structural SCorr constraints can be seen in a simple ABC analysis of a consonant harmony system, such as Kikongo nasal consonant harmony (1) (see Rose & Walker 2004, Walker 2000b for more details). The basic generalization in Kikongo is that sonorants in the stem agree for nasality; this causes suffixes with /l/ (1a) to assimilate to [n] when the root contains a nasal consonant (1b). However, coda nasals are inert: they do not trigger the same agreement (1c).

(1) Kikongo nasal consonant harmony (Ao 1991)

a.	m-[bul-ulu]	'I was hit'	(perfective passive suffix /-ulu/)
b.	ma-[nik-unu]	'it was planted'	(/-ulu/ assimilates to [-unu] after nasals)
c.	tu-[biŋg-ulu]	'we were hunted'	(no assimilation to coda nasals)

The ABC analysis is driven by a CORR constraint, which forces [n] & [l] to be in correspondence with each other. CC-IDENT-[nasal] forces correspondents to agree for nasality; this causes /l/ to assimilate to [n] in (1b). A structural SCorr constraint, SROLE-CC, limits correspondence to only those consonants which have matching syllable roles; it stops codas from corresponding with onsets, and thus prevents a nasal coda from triggering agreement with an onset /l/ (1c).

The claim of this paper is that the theory of Surface Correspondence used in the ABC framework also predicts dissimilation; and, furthermore, that this mechanism of "Dissimilation-By-Correspondence" explains a pattern of R-dissimilation that occurs in Sundanese.

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Dissimilation emerges as a predicted outcome of the same constraints needed for ABC, because Surface Correspondence is rooted in similarity (Walker 2000a,b, Hansson 2001, Rose & Walker 2004). Correspondence is only ever demanded between consonants that share some feature(s). Dissimilar consonants aren't required to correspond with each other; therefore, dissimilating is a way to avoid violating correspondence-based constraints. The resulting theorem is that constraints which penalize surface correspondence also favor dissimilation.

Sundanese presents an example of dissimilation driven by surface correspondence. The generalization in Sundanese (Cohn 1992) is that a sequence /r…r/ dissimilates to [l…r], *unless* the two [r]s are the onsets of two adjacent syllables. Thus, dissimilation occurs when two [r]s are in non-adjacent syllables (2a), as well as when they are in the same syllable (2b). However, dissimilation fails when they are the onsets of two adjacent syllables (3).

(2) **R-dissimilation**: /r/ dissimilates to [l], before another [r]
   a. /a**r**/+/ŋumba**r**a/ → [ŋ=a**l**=umba**r**a] 'go abroad (pl.)'
   b. /a**r**/+/ho**r**mat/ → [h=a**l**=o**r**mat] 'respect (pl.)'

(3) R-dissimilation fails when two /r/s are the onsets of adjacent syllables:
   a. /a**r**/+/**r**ahit/ → [**r**=a**r**=ahit], *[**l**=a**r**=ahit] 'wounded (pl.)'
   b. /a**r**/+/cu**r**iga/ → [c=a**r**=u**r**iga], *[c=a**l**=u**r**iga] 'suspicious (pl.)'

The surface correspondence analysis of this pattern goes like this: a CORR constraint demands correspondence among [rhotic] consonants (i.e. [r]s). But, Structural SCorr constraints impose limits on where surface correspondence is permitted: it's allowed only for segments that are onsets of adjacent syllables. When affixation creates an input that has two /r/s in a configuration where correspondence between them is not permitted, the affix /r/ becomes [l] to escape the need for the illicit [r]~[r] correspondence. That is, R-dissimilation "applies" when two /r/s *cannot* correspond. No dissimilation is needed when two [r]s co-occur in a configuration where correspondence between them *is permitted*. Dissimilation happens to avoid violating the limits imposed on the correspondence (and not as the result of an OCP-like constraint against similar consonants).

The paper is organized as follows. In §2 I present the specific implementation of Surface Correspondence used here, and show how dissimilation emerges via interaction of the same constraints needed for harmony in ABC. §3 lays out the proposed analysis of Sundanese R-dissimilation as a case where dissimilation driven by Surface Correspondence. §4 presents the Sundanese generalizations in detail, and explains how the facts that underlie them are interpreted in terms of Surface Correspondence. §5 shows how the SCorr analysis captures the generalizations. §6 presents corroborating evidence from a pattern of lateral consonant harmony, and §7 has concluding discussion.

2. The Theory of Surface Correspondence

2.1. Formal definition of the Surface Correspondence relation

In the previous literature, there is not an established consensus about how the Surface Correspondence relation is defined, and what its exact properties are. I will begin by proposing the specific formal characterization of the SCorr relation that I will assume for the analysis (building on previous work by Walker 2000a,b, Hansson 2001, and Rose & Walker 2004).

Surface Correspondences are "established" in GEN. Included in each candidate is a Surface Correspondence relation that partitions the output consonants into some number of correspondence classes. Each consonant is 'in correspondence with' all and only the members of its correspondence class. The SCorr relation is thus transitive, symmetric, and reflexive (an equivalence relation).

GEN offers multiple choices for the Surface Correspondence structure of an output form. When outputs have more than one consonant, there is more than one possible way to partition them. These different correspondence possibilities all compete with each other: each distinct partition represents a distinct candidate, and the choice among them is left to the constraints and their ranking.

The table in (4) displays some possible candidates that differ only in their Surface Correspondence profiles. The space of possibilities ranges from candidates like (a), where each output consonant is in

its own correspondence class (and no consonant is in correspondence with any other), to candidates like (e), where all of the output consonants are in a single correspondence class (and each consonant corresponds with all of the others). Between these two extremes lie numerous other possibilities, illustrated by candidates like (b), (c), and (d); in these cases, some of the output consonants are in correspondence with each other, but do not correspond with some of the other consonants.

(4) Some possible candidates with different Surface Correspondence profiles

Output portion of candidate	SCorr $\mathcal{R}$ Structure	Remarks
a. **n$_1$** i **m$_2$** **p$_3$** a **l$_4$** a	{n} {m} {p} {l}	No correspondence between any segments; potentially violates numerous CORR constraints; satisfies all CC-IDENT constraints
↓ ↓ – – b. **n$_1$** i **m$_1$** **p$_2$** a **l$_3$** a	{n m} {p} {l}	{n m} in correspondence; satisfies CORR-[nasal] & CC-IDENT-[nasal]; violates CORR-[labial] & CORR-[sonorant], among others
↓ ↓ – ↓ c. **n$_1$** i **m$_1$** **p$_2$** a **l$_1$** a	{n m l} {p}	{n m l} in correspondence; all sonorants correspond; satisfies CORR-[sonorant] & CORR-[nasal]; violates CC-IDENT-[nasal]
– ↓ – ↓ d. **n$_1$** i **m$_2$** **p$_1$** a **l$_2$** a ↑ – ↑ –	{n p} {m l}	{n p} and {m l} each in correspondence; violates multiple CORR & CC-IDENT constraints; typically sub-optimal
↓ ↓ ↓ ↓ e. **n$_1$** i **m$_1$** **p$_1$** a **l$_1$** a	{n m p l}	All Cs in correspondence; satisfies all CORR constraints; correspondents agree for no features; violates multiple CC-IDENT constraints

(Indices mark correspondence classes; arrows highlight the groups of indices that match)

The table in (5) displays some candidates that, under the formulation of Surface Correspondence proposed here, are impossible because they require ill-formed structures of the correspondence relation. The candidate in (a) is one with an intransitive correspondence pattern; this is not possible, since the SCorr relation is transitive. In (b), the intent is one correspondence relationship among the coronal consonants, and another separate but overlapping correspondence relationship among the nasals. This is not possible because the SCorr relation is an equivalence relation. Consonants are either in the same correspondence class, or they are not: there is no way for two consonants to both correspond, and also *not* correspond, at the same time. The candidate in (c) represents the notion of a second correspondence within a bigger correspondence class. This is not possible since there is only a single Surface Correspondence relation: the output consonants get partitioned only once, so there is no way for the resulting correspondence classes to have recursive structure.

(5) Some *im*possible candidates, with impossible structures for the SCorr relation:

Output portion of candidate	Remarks
↓ ↓ – – a.* **n$_1$** i **m$_{1,2}$** **p$_2$** a **l$_3$** a – ↑ ↑ –	Intended correspondence between [n] & [m], and between [m] & [p], but without [n] & [p] being in correspondence with each other. Impossible because SCorr is a transitive relation.
↓ – – ↓ b.* **n$_{1,2}$** i **m$_2$** **p$_3$** a **l$_1$** a ↑ ↑ – –	Intended correspondence among nasals, and also among coronals. The SCorr relation is not relativized to specific features: consonants either correspond, or don't. Impossible for one partition to put [n] in two classes.
↓ ↓ ↓ ↓ c.* **n$_1$** i **m$_{1,2}$** **p$_{1,2}$** a **l$_1$** a – ↑ ↑ –	All consonants in correspondence, but {m p} also in a second correspondence relationship. Impossible because there is only a single SCorr relation.

2.2. Defining constraints in these terms

The Surface Correspondence structure of the winning output depends on CON. Surface Correspondence structures affect the choice of optima because CON includes constraints which assign violations depending on the Surface Correspondence profile of a candidate. Some examples are given below. CORR constraints are defined according to the schema in (6), and CC-IDENT constraints according to the one in (7). The constraints in (8) & (9) are structural SCorr constraints; they impose restrictions on correspondence based on syllable role and locality, respectively.

(6) **CORR-[αF]**: '[αF] consonants must be in surface correspondence with each other'
For each distinct pair of output consonants C1 & C2, assign a violation if:
(i) C1 & C2 are both [αF] consonants, *and*
(ii) C1 & C2 are not in the same surface correspondence class
(where F is some feature, and α is some value of F)

(7) **CC-IDENT-[±F]**: 'Correspondent Cs agree with each other for [±F]'
For each distinct pair of output consonants C1 & C2, assign a violation if:
(i) C1 & C2 are in the same surface correspondence class, *and*
(ii) C1 & C2 have different values for [±F].

(8) **CC-SROLE**: 'Correspondent Cs have the same syllable role (no onset-coda correspondence)'
For each distinct pair of output consonants C1 & C2, assign a violation if:
(i) C1 & C2 are in the same surface correspondence class, *and*
(ii) C1 & C2 do not have the same syllable role,
(where 'syllable role' ∈{onset, head-of-onset, nucleus, coda})[1]

(9) **CC-SYLLADJ**: 'Correspondence only between adjacent syllables'
For each distinct pair of output consonants C1 & C2, assign a violation if:
(i) C1 & C2 are in the same surface correspondence class, *and*
(ii) C1 & C2 are in non-adjacent syllables, *and*
(iii) there is a syllable intervening between C1 & C2 which contains no member of the same surface correspondence class as C1 & C2

None of the above constraints are new in spirit. They are my own interpretations of how the constraints proposed by Rose & Walker (2004) are defined, based on the formal characterization of the SCorr relation laid out in §2.1. I have adjusted the names to reflect that they are distinct from Rose & Walker's original formulations, and I have constructed new definitions to make it clear how they calculate violations. Otherwise, (6)-(9) are wholly analogous, respectively, to the constraints 'CORR-C↔C', 'IDENT-CC(F)', 'SROLE-CC', and 'PROXIMITY', that Rose & Walker propose based on consonant harmony patterns cross-linguistically.

2.3. How Surface Correspondence constraints lead to dissimilation

CORR constraints require surface correspondence based on shared features. Structural SCorr constraints operate by prohibiting surface correspondence under the wrong conditions. Dissimilation offers a way to satisfy both of those demands at the same time. When consonants dissimilate, they stop sharing some feature. If two consonants stop sharing features, they no longer need to be in correspondence with each other. This interaction is schematically illustrated in the tableau in (10).

[1] The distinction between the syllable roles 'onset' and 'head of onset' is made to separate [r]s which *are* onsets from [r]s which are members of onset clusters (i.e. [.**r**a.] vs. [.b**r**a.]), a division that is empirically necessary for Sundanese. For purposes of this paper, I take the head of the onset to be its least sonorous consonant; thus, the [r] in [.ra.] has the structural role 'head-of-onset', while [r] in [.bra.] has the role 'onset'.

(10) The Dissimilation-By-Correspondence interaction

Input: /rohira/		CORR-[rhotic]	CC-SYLLADJ	IDENT-[rhotic]
☞ a.	**r**$_1$o.h$_2$i.**l**$_3$a SCorr $\mathcal{R}$:{r}{h}{l}	**0**	**0**	1
~ b.	**r**$_1$ o.h$_2$i.**r**$_1$a SCorr $\mathcal{R}$:{r r}{h}	0	**1!** (**W**)	0 (L)
~ c.	**r**$_1$o.hi$_2$.**r**$_3$a SCorr $\mathcal{R}$:{r}{h}{r}	**1!** (**W**)	0	0 (L)

(Correspondence classes shown as sets, and marked by indices)

In this illustrative example, CORR-[rhotic] demands correspondence between [+rhotic] consonants; this rules out the faithful, non-correspondent, candidate (c). CC-SYLLADJ forbids correspondence between consonants in non-adjacent syllables; this rules out the faithful, correspondent, candidate (b). Dissimilation (a) satisfies both CORR-[rhotic] *and* CC-SYLLADJ. The dissimilated [l] isn't a rhotic consonant, so it doesn't need to correspond with the remaining [r]. Since the [r] & [l] don't correspond with each other, their non-proximity isn't an issue; this candidate incurs no CC-SYLLADJ violations. The result is that CORR-[rhotic] & CC-SYLLADJ, together, penalize sequences of two [r]s in non-adjacent syllables, and thereby favor dissimilation of one /r/ to a non-rhotic alternative like [l].

The point here is that the constraints used in ABC to explain consonant harmony also predict dissimilation. This outcome emerges simply from the interaction of constraints that demand correspondence, and constraints that limit it. It does not require any extra facilitating assumptions (cf. 'BIJECTIVITY' of Walker 2000a), and it does not employ the OCP or other anti-similarity constraints posited specifically to account for dissimilation. Rather, dissimilation arises simply from Surface Correspondence and limits imposed on it. I claim this is a good prediction, because R-dissimilation in Sundanese behaves in exactly this way. In what follows, I present a Surface Correspondence analysis of the Sundanese case, and show how it explains the pattern of dissimilation observed.

3. Proposal

3.1. Sundanese R-Dissimilation: a consequence of Surface Correspondence

Sundanese (Cohn 1992) has a plural[2] affix /ar/, which alternates between two surface forms – [ar] & [al]. This affix is a prefix before vowel-initial roots, and an infix following the first consonant of a consonant-initial root. Thus, the affixation of /ar/ yields the two configurations illustrated in (11) & (12). Cohn (1992:201) notes that this infixation is typical for /VC/ prefixes in Sundanese.

(11) **aR**-VCVC [**ar**-ajɨm] 'patient (pl.)'

(12) C-**aR**-VCVC(V) [k=**ar**=usut] 'messy (pl.)'

The affix /ar/ dissimilates to its alternate form [al] when the root contains a following /r/ (13), (14), *unless the two /r/s are the onsets of adjacent syllables* (15), (16) (examples repeated from (2) & (3) above).

(13) /a**r**/+/ŋumba**r**a/ → [ŋ=a.**l**=um.ba.**r**a] 'go abroad (pl.)'
c=a.**R**=v.cv.**R**v → c=a.**L**=v.cv.**R**v (R-dissimilation occurs)

(14) /a**r**/+/ho**r**mat/ → [h=a.**l**=o**r**.mat] 'respect (pl.)'
c=a.**R**=v**R**.cvc → c=a.**L**=v**R**.cvc (R-dissimilation occurs)

[2] According to Cohn (1992:fn.1), the /ar/ affix technically has distributed meaning rather than plural, but that's irrelevant for the purposes of this analysis. I will follow Cohn in referring to it as 'plural' for convenience.

(15)	/a**r**/+/**r**ahɨt/	→	[**r**=a.**r**=a.hɨt]	'wounded (pl.)'
	R=a.**R**=v.cvc	→	**R**=a.**R**=v.cvc	(no dissimilation)
(16)	/a**r**/+/cu**r**iga/	→	[c=a.**r**=u.**r**i.ga]	'suspicious (pl.)'
	c=a.**R**=v.**R**v.cv	→	c=a.**R**=v.**R**v.cv	(no dissimilation)

The Surface Correspondence explanation for this pattern is that Sundanese R-dissimilation results from failed correspondence. Sundanese requires [r]s to be in correspondence with each other. But, correspondence is permitted only between consonants that are in adjacent syllables, and have matching structural roles within the syllable (e.g both are onsets). R-dissimilation happens in order to meet these conditions on Surface Correspondence. Thus, dissimilation occurs when two /r/s are in a configuration where correspondence between them is disallowed. When two /r/s are in a configuration where correspondence between them *is* allowed, R-dissimilation fails.

3.2. Representational assumptions

Sundanese has two liquid consonants, [l] & [r].[3] I assume that these segments differ only on one, binary, feature. I take this feature to be [±lateral]: [l] is [+lateral], while [r] is [–lateral]. For expository convenience, I will use the term "rhotic" as shorthand for "[–lateral]".

3.3. The relevant constraints and their ranking

The constraints on Surface Correspondence which are relevant for the analysis of R-dissimilation in Sundanese are listed in (17)-(20). The first two, (17) & (18), are CORR constraints. They are defined according to the schema given in (6); one demands correspondence among rhotic consonants, while the other demands correspondence among all liquids (whether rhotic or lateral). The other two correspondence-related constraints are the same structural SCorr constraints previously defined in (8) & (9).

(17) **CORR-[rhotic]**: 'Rhotics must be in surface correspondence'
(18) **CORR-[liquid]**: 'Liquids must be in surface correspondence'

(19) **CC-SROLE**: 'No onset-coda correspondence'
(20) **CC-SYLLADJ**: 'Correspondence only between adjacent syllables'

The remaining two constraints used in the analysis are familiar Input-Output faithfulness. The first, (21) is IDENT-[rhotic], which demands faithfulness for rhoticity; it penalizes the /r/→[l] change seen in dissimilation. The other, in (22), is its cousin IDENT-Root-[rhotic], a positional faithfulness constraint (Beckman 1998) that demands faithfulness only for rhotic consonants that are in the root.

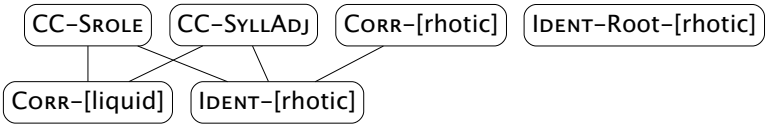
(21) **IDENT-[rhotic]**: 'Faithfulness for [rhotic]'
For any input segment X and its output correspondent X', assign 1 violation if:
(i) X & X' have different values for the feature [±lateral]

(22) **IDENT-Root-[rhotic]**: 'Faithfulness for [rhotic], for segments in the root'
For any input segment X and its output correspondent X', assign 1 violation if:
(i) X & X' have different values for the feature [±lateral] *and*
(ii) X is a segment in a morphological root

[3] The phonetic realization of both segments shows variation, though there seems to be little information about this in the literature. For the consultant I worked with, the segment transcribed here as [r] may be realized as either a tap or a trill in non-initial position. The segment transcribed as [l] seems consistently lateral, but may be strongly velarized [ɬ], particularly word-finally. This range of variation does not seem to bear on the phonological pattern.

The ranking conditions that explain Sundanese R-dissimilation are shown in the diagram in (23). This ranking enforces a requirement that rhotic consonants correspond with each other, but limits correspondence to consonants in adjacent syllables, with matching syllable roles. Where two rhotic consonants cannot correspond without violating those limits, one dissimilates; this violates IDENT-[rhotic] instead of the higher-ranked CORR-[rhotic].

(23) Sundanese ranking:



4. The Sundanese Facts

The essential generalization is that a pair of /r/s undergoes dissimilation, *unless* they are the onsets of two adjacent syllables. The empirical basis for this generalization is that the plural affix /ar/ surfaces as [al] when attached to roots containing an /r/ in some positions, but not others; these cases are considered here in more detail.

The plural affix /ar/ dissimilates to [al] whenever the root contains another /r/, and the two /r/s are in positions with different syllable roles. Thus, R-dissimilation occurs when the root /r/ is a coda and the affix /r/ is an onset. This is shown in (24), where the root /r/ is in a syllable following the affix /r/, and in (25), where the /r/s are the onset and coda of the same syllable. The dissimilation also occurs when the root contains an /r/ inside a complex onset (26). (Sundanese examples in this section are from Cohn (1992), except where noted otherwise; syllabification is done using the same algorithm as Cohn.)

(24) Root /r/ is coda of a syllable following the affix /r/: R-dissimilation applies

a.	b=a.**l**=ɨŋ.ha**r**	'rich (pl.)'	
b.	n=a.**l**=u.hu**r**.-kɨn	'dry (pl.)'	(Cohn 1990)
c.	(ʔ)=a.**l**=u.**l**u**r**	'lower on a rope (pl.)'	(own data)[4]

(25) Root /r/ is coda of same syllable containing affix /r/: R-dissimilation applies

a.	h=a.**l**=o**r**.mat	'respect (pl.)'
b.	p=a.**l**=ə**r**.ce.ka	'handsome (pl.)'

(26) Root /r/ is part of a complex onset following affix /r/: R-dissimilation applies

a.	c=a.**l**=om.b**r**ek	'cold (pl.)'
b.	m=a.**l**=o.t**r**et	'take a picture (pl.)'

The Dissimilation-By-Correspondence interpretation of these cases is that two [r]s cannot correspond with each other if they have different syllable roles. Since they cannot correspond, they must dissimilate in order to satisfy the requirement that rhotic consonants correspond with each other.

R-dissimilation also occurs when two /r/s are in non-adjacent syllables, even if they have matching syllable roles. This is shown in (27). In these forms, the root /r/ and the affix /r/ are both in onset positions, but they are not onsets of two adjacent syllables; R-dissimilation occurs here.

(27) Root /r/ and affix /r/ are onsets of non-adjacent syllables: R-dissimilation applies

a.	ŋ=a.**l**=um.ba.**r**a	'go abroad (pl.)'
b.	s=a.**l**=i.du.**r**u	'sit by a fire (pl.)'

[4] Van Syoc (1959) reports glottal stops before all post-pausal vowels in Sundanese. I did not perceive a prominent glottal stop at the beginning of this word in the speech of my consultant, but it's here for parity.

The Surface Correspondence interpretation of this case is that [r]s cannot correspond if they are not in adjacent syllables (regardless of what their syllable roles are).

R-dissimilation does not happen in all cases, though: two /r/s *can* co-occur when they are the onsets of two adjacent syllables. As such, there is no dissimilation when the affix /r/ is followed by another syllable with [r] as its onset (28). Likewise, dissimilation does not occur when /ar/ is infixed following a root-initial /r/ (29).

(28) Root /r/ is the onset of the syllable following affix /r/: no R-dissimilation

a.	c=a.**r**=u.**r**i.ga	'suspicious (pl.)'	
b.	di-.k=a.**r**=i.**r**im	'sent (passive) (pl.)'	
c.	t=a.**r**=i.**r**is	'cold (pl.)'	(own data)

(29) Root /r/ is the onset of a syllable before affix /r/ (= root-initial): no R-dissimilation

a.	**r**=a.**r**=a.hit	'wounded (pl.)'	
b.	**r**=a.**r**=i.wat	'startled (pl.)'	
c.	**r**=a.**r**=u.ge.l-an	'do often (pl.)'	(own data)

The lack of dissimilation in these cases is the result of successful correspondence. In these forms, the two [r]s are in adjacent syllables, and have matching syllable roles. Correspondence between them is therefore permitted, and so no dissimilation is needed.

Finally, there is no dissimilation when the root contains no /r/s:

(30) Root contains no /r/s at all: no R-dissimilation

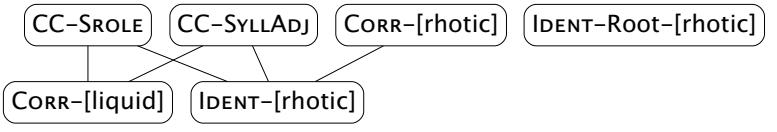
a.	k=a.**r**=u.sut	'messy (pl.)'	
b.	p=a.**r**=o.ho	'forget (pl.)'	(Hansson 2001)
c.	m=a.**r**=i.hak	'take sides (pl.)'	(Cohn 1990)

In this case, the affix /r/ is the only rhotic consonant. In the absence of other rhotics, no correspondence is required of this lone /r/, so it just emerges faithfully as [r].

5. The Dissimilation-By-Correspondence explanation

The ranking that explains the Sundanese R-dissimilation pattern is repeated in (31).

(31) Ranking obtained for Sundanese:



5.1. Explaining R-dissimilation

Since R-dissimilation happens for /r/s in non-adjacent syllables, correspondence must be limited to adjacent syllables only. This is explained by CORR-[rhotic] and CC-SYLLADJ each dominating IDENT-[rhotic]. The result is that rhotics in non-adjacent syllables are required to correspond, but forbidden from doing so. This makes dissimilation optimal, as shown in the tableau in (32).[5]

[5] The tableauxs in this section use a hybrid comparative format. Winning candidates are always given in row (a), and other rows represent comparisons between the winner and an alternative, losing, candidate. Integers in parentheses show the constraint violations for each candidate in the comparison; Ws & Ls indicate a constraint's preference for the Winner or the Loser (Prince 2002). SCorr indices are not shown for non-liquids, and the [r]s & [l]s in each candidate are capitalized for visibility.

(32) CC-SYLLADJ, CORR-[rhotic] » IDENT-[rhotic]

Input: /ar-ŋumbara/ Output: [ŋ=a.**l**=um.ba.**r**a]		CC-SYLLADJ	CORR-[rhotic]	IDENT-[rhotic]
☞ a.	ŋ=a.**L₂**=um.ba.**R₅**a SCorr $\mathcal{R}$:{ŋ}**{l}**{m}{b}**{r}**	(0)	(0)	(1)
~ b.	ŋ=a.**R₂**=um.ba.**R₂**a SCorr $\mathcal{R}$:{ŋ}**{r r}**{m}{b}	**W** **(0~1)**		**L** **(1~0)**
~ c.	ŋ=a.**R₂**=um.ba.**R₅**a SCorr $\mathcal{R}$:{ŋ}**{r}**{m}{b}**{r}**		**W** **(0~1)**	**L** **(1~0)**

R-dissimilation in onset-coda situations shows that onsets cannot correspond with codas. So, the syllable-role constraint CC-SROLE must dominate IDENT-[rhotic] too, as shown in (33).[6]

(33) CC-SROLE » IDENT-[rhotic]

Input: /ar-hormat/ Output: [h=a.**l**=o**r**.mat]		CC-SROLE	CC-SYLLADJ	CORR-[rhotic]	IDENT-[rhotic]
☞ a.	h=a.**L₂**=o**R₃**.mat SCorr $\mathcal{R}$:{h}**{l}{r}**{m}{t}	(0)	(0)	(0)	(1)
~ b.	h=a.**R₂**=o**R₂**.mat SCorr $\mathcal{R}$:{h}**{r r}**{m}{t}	**W** **(0~1)**			**L** **(1~0)**
~ c.	h=a.**R₂**=o**R₃**.mat SCorr $\mathcal{R}$:{h}**{r}{r}**{m}{t}			**W** **(0~1)**	**L** **(1~0)**

Dissimilation happens in order to avoid an unacceptable Surface Correspondence structure: one /r/ becomes [l] so that it isn't forced into unacceptable correspondence with the other [r]. It follows that when R-dissimilation happens, correspondence must not be required between the resulting [l] and [r]. This means that each of the constraints which limits correspondence also must dominate any other CORR constraint(s) that favor correspondence between [r]s & [l] (represented here by CORR-[liquid]). This is shown in the two tableauxs below, for CC-SYLLADJ (34) and CC-SROLE (35) respectively.

(34) CC-SYLLADJ » CORR-[liquid]

Input: /ar-ŋumbara/ Output: [ŋ=a.**l**=um.ba.**r**a]		CC-SROLE	CC-SYLLADJ	CORR-[rhotic]	IDENT-[rhotic]	CORR-[liquid]
☞ a.	ŋ=a.**L₂**=um.ba.**R₅**a SCorr $\mathcal{R}$:{ŋ}**{l}**{m}{b}**{r}**	(0)	(0)	(0)	(1)	(1)
~ b.	ŋ=a.**L₂**=um.ba.**R₂**a SCorr $\mathcal{R}$:{ŋ}**{l r}**{m}{b}		**W** **(0~1)**		e (1~1)	**L** **(1~0)**

(35) CC-SROLE » CORR-[liquid]

Input: /ar-hormat/ Output: [h=a.**l**=o**r**.mat]		CC-SROLE	CC-SYLLADJ	CORR-[rhotic]	IDENT-[rhotic]	CORR-[liquid]
☞ a.	h=a.**L₂**=o**R₃**.mat SCorr $\mathcal{R}$:{h}**{l}{r}**{m}{t}	(0)	(0)	(0)	(1)	(1)
~ b.	h=a.**L₂**=o**R₂**.mat SCorr $\mathcal{R}$:{h}**{l r}**{m}{t}	**W** **(0~1)**			e (1~1)	**L** **(1~0)**

[6] The same ranking also explains the occurrence of R-dissimilation when the root /r/ is in an onset cluster, in forms like [c=a.**l**=om.b**r**ek] (26a). Here, one /r/ has the syllable role 'head-of-onset', while the other has the role 'onset'. Correspondence between them is ruled out exactly as in the onset-coda condition in (33).

This ranking also predicts no dissimilation for two /r/s in codas of adjacent syllables. I know of no combinations of Sundanese morphemes that yield pairs of coda /r/s, so I have not been able to test this prediction.

Since root-internal /r/s do not alternate, the winning candidates never violate IDENT-Root-[rhotic]; this constraint is taken as undominated. Undominated IDENT-Root-[rhotic] explains the direction of dissimilation: it's always the affix /r/ that dissimilates, never the /r/ in the root. This is shown in (36).

(36) Undominated IDENT-Root-[rhotic] explains the direction of dissimilation:

Input: /ar-hormat/ Output: [h=a.l=or.mat]		IDENT-Root-[rhotic]	CC-SROLE	CC-SYLLADJ	CORR-[rhotic]	IDENT-[rhotic]	CORR-[liquid]
☞ a.	h=a.$\mathbf{L_2}$=o$\mathbf{R_3}$.mat SCorr $\mathcal{R}$:{h}**{l}{r}**{m}{t}	(0)	(0)	(0)	(0)	(1)	(1)
~ b.	h=a.$\mathbf{R_2}$=o$\mathbf{L_3}$.mat SCorr $\mathcal{R}$:{h}**{r}{l}**{m}{t}	**W** **(0~1)**				e (1~1)	e (1~1)

5.2. Explaining where R-dissimilation fails

When two /r/s are the onsets of adjacent syllables, nothing prevents them from corresponding with each other; both can surface faithfully, as rhotics. This is shown in (37). In the winning candidate (a), the root [r] and the affix [r] are in correspondence with each other. Having this correspondence satisfies both CORR-[rhotic] & CORR-[liquid], and incurs no violations of CC-SROLE or CC-SYLLADJ.

(37) No R-dissimilation where correspondence between [r]s is not penalized:

Input: /ar-hormat/ Output: [h=a.l=or.mat]		IDENT-Root-[rhotic]	CC-SROLE	CC-SYLLADJ	CORR-[rhotic]	IDENT-[rhotic]	CORR-[liquid]
☞ a.	$\mathbf{R_1}$=a.$\mathbf{R_1}$=a.hɨt SCorr $\mathcal{R}$:**{r r}**{h}{t}	(0)	(0)	(0)	(0)	(0)	(0)
~ b.	$\mathbf{R_1}$=a.$\mathbf{R_2}$=a.hɨt SCorr $\mathcal{R}$:**{r}{r}**{h}{t}				**W** **(0~1)**		**W** **(0~1)**
~ c.	$\mathbf{R_1}$=a.$\mathbf{L_2}$=a.hɨt SCorr $\mathcal{R}$:**{r}{l}**{h}{t}					**W** **(0~1)**	**W** **(0~1)**

Thus, R-dissimilation fails to occur where correspondence is permitted. The lack of dissimilation in adjacent-syllable onsets is due to the lack of restrictions against correspondence in this configuration.

6. More supporting evidence: Sundanese lateral harmony

In addition to R-dissimilation, Sundanese liquids also exhibit a pattern of consonant harmony for [±lateral] (Cohn 1992). The same plural affix /ar/ that exhibits the R-dissimilation effect also surfaces as [al] when it follows a root-initial /l/ (38).

(38) Sundanese lateral harmony:

a.	l=a.l=ɨ.tik	'little (pl.)'	(Cohn 1992)
b.	l=a.l=ə.ga	'wide (pl.)'	(Cohn 1992)
c.	l=a.l=i.ren	'take a break (pl.)'	(own data)

This lateral harmony happens only under the conditions where R-dissimilation fails. The /r/ in the /ar/ affix assimilates to [l] when infixed after a root-initial /l/ – a situation when both liquids are the onsets of adjacent syllables. /r/ does not assimilate to agree with an [l] in a coda or complex onset, nor to agree with an [l] in a non-adjacent syllable. Consequently, the two patterns have nearly opposite distributions: lateral harmony *only* applies to onsets of adjacent syllables, and R-dissimilation *never* applies to onsets of adjacent syllables.

The inverse relationship between harmony & dissimilation in Sundanese dovetails with the 'Dissimilation-By-Correspondence' analysis proposed here. Lateral harmony is understood as agreement among corresponding consonants (Rose & Walker 2004), so its occurrence indicates correspondence between the agreeing consonants. The explanation for R-dissimilation posits that Sundanese allows surface correspondence between consonants only when they have matching syllable roles, and are in adjacent syllables. The fact that lateral harmony applies in this situation confirms that Sundanese does indeed permit correspondence between consonants in this arrangement. The absence of lateral harmony between onsets and codas, and between non-adjacent syllables, is also consistent with the assumption that correspondence is prohibited in these cases. R-dissimilation fails in those situations where correspondence is permitted; lateral harmony provides independent evidence that correspondence is permitted in those situations.

7. Summary and Conclusions

In this paper, I have claimed that the same theory of Surface Correspondence used to explain consonant harmony in the ABC framework also predicts dissimilation, as a way of avoiding penalized correspondence. This prediction emerges because Surface Correspondence is required on the basis of similarity between consonants: this means that constraints which limit surface correspondence necessarily favor dissimilation as an alternative. I have further claimed that this kind of dissimilation is attested by Sundanese, in which R-dissimilation occurs *only* in those situations where correspondence is penalized. The Surface Correspondence restrictions posited in order to explain R-dissimilation are also corroborated by a separate pattern of consonant harmony in Sundanese.

The proposed explanation does not invoke any theoretical machinery specific to dissimilation, like the OCP or anti-similarity constraints (cf. Suzuki 1998, among others). Dissimilation arises, under the theory advanced here, from just the interaction of constraints that demand Surface Correspondence, and constraints that penalize it. The constraints that explain Sundanese R-dissimilation are not new or ad hoc: they are the same constraints needed to explain consonant harmony in the Agreement-By-Correspondence framework. The CORR constraints that demand correspondence are independently motivated by the typology of consonant harmony (Hansson 2001, Rose & Walker 2004), and the two structural SCorr constraints CC-SROLE & CC-SYLLADJ are drawn from analyses Rose & Walker (2004) propose for nasal harmony in Bantu languages.

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