Class 3
Correspondence and Reduplicative Opacity

4/18/2023

1 Overapplication, Underapplication, and Normal Application in Reduplication

- Early generative phonology assumed that phonological processes (which include distributional restrictions) should apply equally to reduplicants as to unreduplicated words.
  - Assumption is that reduplicative copying happens first, then phonological processes apply.

- Wilbur (1973) first observed that this is not always the case.
  - McCarthy & Prince (1995) build on this, pointing out that all such cases promote identity between base and reduplicant.
  - ⇒ This is the motivation for positing BR correspondence.

⋆ Caveat: a lot of this data has been challenged since it was first used as evidence for these sorts of interactions.
  - We'll start looking deeper at some of these challenges over the next few weeks.
  - The validity of this data is crucial to adjudicating between different frameworks for reduplication.

1.1 Normal Application

- "Normal application" refers to cases where the process/distribution that holds generally of the language holds also in reduplication.
  - The distribution of [d] ∼ [ɾ] in Tagalog is one such example.

- Tagalog has an intervocalic flapping process.

(1) a. /d/ → [ɾ] / V_V
b. /d/ → [d] elsewhere (namely, #_ & C_)

- This distribution does hold in reduplication, even if it means that a [d] corresponds to a [ɾ]:

(2) Flapping in Tagalog (McCarthy & Prince 1995:3; Carrier 1979:150)

	Stem	Reduplicated			Gloss
a.	datiŋ	d̲-um-ā̲-ɾatiŋ	*ɾ̲-um-ā̲-ɾatiŋ	*d̲-um-ā̲-datiŋ	'arrive'
b.	diŋat	ka-ɾ̲i̲ŋ̲a̲t̲-diŋat	*ka-ɾ̲i̲ŋ̲a̲t̲-ɾiŋat	*ka-d̲i̲ŋ̲a̲t̲-diŋat	'suddenly'

- In (2a), the reduplicant-initial consonant is not intervocalic, so (1a) should not apply to it, i.e. it should surface as [d]. It is [d], therefore *normal application*.
- In (2a), the root-initial consonant is intervocalic, so (1a) should apply to it, i.e. it should surface as [ɾ]. It is [ɾ], therefore *normal application*.
- In (2b), the contexts are reversed, but both still exhibit the expected outcomes of (1), therefore *normal application*.

1.2 Overapplication

- In terms of rule application, "overapplication" refers to cases where a phonological rule appears to apply in the reduplicant even though the environment for the rule is not met by the reduplicant.
  - The environment for the rule *is* met in the base, and it applies there as expected.

- The distribution of [h] in Javanese is such a case.
  - Javanese has a deletion process that deletes *h* intervocalically:

(3) a. /h/ → Ø / V_V
    b. /h/ → [h] elsewhere (namely, _C)

- The application of these rules outside of reduplication is illustrated by (4a).

(4) Javanese *h* deletion (McCarthy & Prince 1995:2)

	Stem	i. _+C	ii. _+V	iii. *"Expected" Red*	Gloss
a.	anɛh	anɛh-ku	anɛ.-e	—	'strange'
b.	bəḍah	bəḍah-bəḍah	bəḍa-bəḍa.-e	*bəḍa[h]-bəḍa.-e	'broken'
c.	ḍajɔh	ḍajɔh-ḍajɔh	ḍajɔ-ḍajɔ.-e	*ḍajɔ[h]-ḍajɔ.-e	'guest'

∗ I assume the reduplicant is the first copy not the second, but this ultimately makes little difference.

- This distribution doesn't fully hold in reduplication (4b,c):

1. When the base is followed by a consonant or nothing (column i.), [h] appears in both copies.
   - In both positions, it should not be subject to the deletion rule (3a), and it evidently is not.

2. When the base is followed by a V-initial suffix (column ii.), the second copy meets the context for the deletion rule (3a), so we expect deletion, and we get it.
   - However, the context at the juncture between the copies has not changed — it does not meet the environment for the deletion rule (3a) — so we should not expect the deletion rule to apply.
   - ⋆ Yet it does appear to "apply", since the *h* appears to be "deleted".

→ This is "**overapplication**" because the deletion rule has seemingly applied outside of its context.

- This case at least can be analyzed through rule ordering, assuming that reduplicative copying is a rule that can be ordered, and it is ordered after *h*-deletion.

(5) Copying rule ≈ if you have RED, copy the root material present at that stage of the derivation

(6) Javanese rule ordering

		/anɛh-ku/	/anɛh-e/	/RED-bəḍah/	/RED-bəḍah-e/
Rule 1.	*h*-deletion	—	anɛ.-e	—	RED-bəḍa-e
Rule 2.	Copying	—	—	bəḍah-bəḍah	bəḍa-bəḍa-e
		[anɛhku]	[anɛ.e]	[bəḍahbəḍah]	[bəḍabəḍa.e]

- This is essentially a counterbleeding interaction, because *h*-deletion would not have applied if the order were reversed.
  - Overapplication can thus be thought of as a type of opacity

(7) Javanese rule ordering reversed — wrong outcome

		/anɛh-ku/	/anɛh-e/	/RED-bəḍah/	/RED-bəḍah-e/
Rule 2.	Copying	—	—	bəḍah-bəḍah	bəḍah-bəḍah-e
Rule 1.	*h*-deletion	—	anɛ.-e	—	bəḍah-bəḍa-e
		[anɛhku]	[anɛ.e]	[bəḍahbəḍah]	*[bəḍahbəḍa.e]

- McCarthy & Prince (1995:2) define overapplication independent of framework as:

> "A phonological mapping will be said to overapply when it introduces, in reduplicative circumstances, a disparity between the output and the lexical stem that is not expected on purely phonological grounds."

- Put another way, overapplication means that the reduplicant resembles the base more than the root.
  - "*h*-deletion" "applies" in the reduplicant because it applied in the base.
  - This is at the heart of the rule ordering analysis
    - The reduplicant copies a constituent which has already undergone the process.
    - It does not undergo the process *per se*.

1.3 Underapplication

- Underapplication is the opposite, but notionally equivalent.

- In terms of rule application, "underapplication" refers to cases where a phonological rule *fails* to apply in the reduplicant even though the environment for the rule *is* met in the reduplicant.
  - The environment for the rule *is not* met in the base, and it does not apply there, as expected.

- Akan has a reduplication pattern that seems work this way.
  - Akan has a CV reduplicant, where the V is always [ɪ], regardless of the base vowel.
  - Akan disallows velars and *h* (maybe others) before high front [ɪ] (and maybe others):

(8) a. /k,h/ → [tɕ,ç] / _ ɪ
b. /k,h/ → [k,h] elsewhere

∗ N.B.: McCarthy, Kimper, & Mullin (2012:211–212) argue this isn't an active phonological process.

- This distribution does not hold in reduplication:
  - The palatalization process fails to apply — i.e. "underapplies" — in the reduplicant.

(9) Akan palatalization (M&P:3)

	Stem	Reduplicated	"Expected"	Gloss
a.	kaʔ	kɪ-kaʔ	*tɕɪ-kaʔ	'bite'
b.	hawʔ	hɪ-hawʔ	*çɪ-hawʔ	'trouble'

- This sort of underapplication is also amenable to a rule ordering analysis.
  - If the palatalization rule applies before the reduplicant [ɪ] is introduced into the derivation, palatalization will be *counterfed*.
  - Underapplication can therefore also be view as an opaque interaction.

(10) Akan rule ordering 1

		/RED-kaʔ/	/kɪʔ/ (hypothetical)
Rule 1.	Palatalization	—	tɕɪʔ
Rule 2.	Reduplication w/ [ɪ]	kɪ-kaʔ	—
		[kɪ-kaʔ]	[tɕɪʔ]

(11) Akan rule ordering 2

		/RED-kaʔ/	/kɪʔ/ (hypothetical)
Rule 1.	Reduplication	ka-kaʔ	—
Rule 2.	Palatalization	—	tɕɪʔ
Rule 3.	Reduction to [ɪ]	kɪ-kaʔ	—
		[kɪ-kaʔ]	[tɕɪʔ]

- McCarthy & Prince (1995:3) describe underapplication independent of framework as:

> "...the general phonological pattern of the language leads us to expect a disparity between the underlying stem (with *k*) and the reduplicant (where we ought to see *tɕɪ*), and we do not find it. The effect is to make the actual reduplicant more closely resemble the stem."

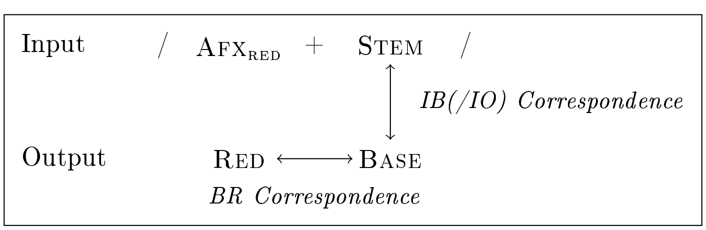
- Therefore, both overapplication and underapplication seem to be operating so as to make the base and reduplicant more similar.

2 Base-Reduplicant Correspondence Theory

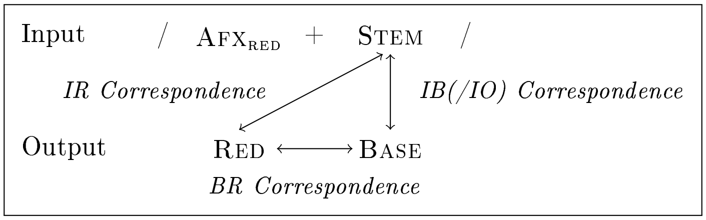
- The fact that overapplication and underapplication exist, and that they can be characterized as enhancing the similarity between base and reduplicant, led McCarthy & Prince (1995, 1999) to propose the notion of **Correspondence** between base and reduplicant, and indeed along other dimensions.

(12) Base-Reduplicant Correspondence Theory (McCarthy & Prince 1995:4)

a. Basic Model



b. Full Model



- Faithfulness constraints are defined over each correspondence relation.
  - In theory, *the same* faithfulness constraints should be definable across all correspondence relations.
  - → The theory of faithfulness constraints is independent of the theory of correspondence relations.

- Faithfulness constraints along any correspondence dimension may be freely ranked with respect to faithfulness constraints along any other (or the same) correspondence dimension
  - There may need to be restrictions on IR faithfulness...

- To derive standard cases of normal application, overapplication, and underapplication, we just need three types of constraints:

  1. Markedness constraints
  2. IO faithfulness constraints
  3. BR faithfulness constraints

∗ IR faithfulness constraints are only necessary to model different / more complicated cases.

- In all cases where we are dealing with some kind of "application", we necessarily have a phonological process.
  - Phonological processes entail the ranking Markedness ≫ IO-Faithfulness
- The main question, then, is how do BR faithfulness constraints rank relative to this ranking fragment?
  - Also: what happens when there are additional markedness constraints and/or IO faithfulness constraints in play?

2.1 Excursus: Distributions in OT

- For any two sounds, there are four different kinds of basic distributions:

(13) Kinds of distributions
  a. Full contrast
  b. Neutralization
  c. Allophony
  d. No contrast

- In OT, these distributions fall out from the factorial typology of three types of basic constraints:

(14) Three different kinds of constraints
  a. Faithfulness constraints — e.g. Ident[voice]-IO
  b. *Context-free* Markedness constraints — e.g. NoVoicedObs (*D)
  c. *Context-sensitive* Markedness constraints — e.g. NoIntervocalicVoicelessObs (*VTV)

2.1.1 Language 1: Full Contrast

- In Language 1 (15), voiced and voiceless obstruents contrast in all positions. This follows from the ranking in (16), where faithfulness outranks all of the markedness constraints (thus markedness plays no role).

(15) **Language 1: Full Contrast**

Word-final	Intervocalic
/pat/ → [pat]	/pat-o/ → [pato]
/pad/ → [pad]	/pad-o/ → [pado]

(16) **Full Contrast ranking**

𝔽	≫	$\mathbb{M}_{CS}$	,	$\mathbb{M}_{CF}$
Ident[voice]	≫	*VTV	,	*D

- This is demonstrated with the following tableaux:

(17)

/pat/	Ident[voice]	*VTV	*D
☞ a. [pat]			
b. [pad]	*!		*

(18)

/pad/	Ident[voice]	*VTV	*D
a. [pat]	*!		
☞ b. [pad]			*

(19)

/pat-o/	Ident[voice]	*VTV	*D
☞ a. [pat-o]		*	
b. [pad-o]	*!		*

(20)

/pad-o/	Ident[voice]	*VTV	*D
☞ a. [pat-o]	*!	*	
b. [pad-o]			*

2.1.2 Language 2: Neutralization

- In Language 2 (21), voiced and voiceless obstruents contrast in most positions (e.g. word-finally), but are neutralized to voiced in intervocalic position (driven by the context-sensitive markedness constraint). This follows from the ranking in (22).

(21) **Language 2: Neutralization**

Word-final	Intervocalic
/pat/ → [pat]	**/pat-o/ → [pado]**
/pad/ → [pad]	/pad-o/ → [pado]

(22) **Neutralization ranking**

$\mathbb{M}_{CS}$	≫	𝔽	≫	$\mathbb{M}_{CF}$
*VTV	≫	Ident[voice]	≫	*D

- This is demonstrated with the following tableaux:

(23)

/pat/	*VTV	Ident[voice]	*D
☞ a. [pat]			
b. [pad]		*!	*

(24)

/pad/	*VTV	Ident[voice]	*D
a. [pat]		*!	
☞ b. [pad]			*

(25)

/pat-o/	*VTV	Ident[voice]	*D
a. [pat-o]	*!		
☞ b. [pad-o]		*	*

(26)

/pad-o/	*VTV	Ident[voice]	*D
☞ a. [pat-o]	*!	*	
b. [pad-o]			*

2.1.3 Language 3: Allophony

- In Language 3 (27), voiced and voiceless obstruents both appear, but they never contrast.
  - We observe the voiced obstruent in intervocalic position (driven by the context-sensitive markedness constraint), but the voiceless obstruent everywhere else (driven by the context-free markedness constraint).
  - This is an allophonic (complementary) distribution, where the value of voicing in obstruents is completely predictable.

- This follows from the ranking in (28), where only markedness ever plays a role (faithfulness is irrelevant).

(27) **Language 3: Allophony**

Word-final	Intervocalic
/pat/ → [pat]	/pat-o/ → [pado]
/pad/ → [pat]	/pad-o/ → [pado]

(28) **Allophony ranking**

$\mathbb{M}_{CS}$	≫	$\mathbb{M}_{CF}$	≫	$\mathbb{F}$
*VTV	≫	*D	≫	IDENT[voice]

- This is demonstrated with the following tableaux:

(29)

/pat/	*VTV	*D	IDENT[voice]
☞ a. [pat]			
b. [pad]		*!	*

(30)

/pad/	*VTV	*D	IDENT[voice]
☞ a. [pat]			*
b. [pad]		*!	

(31)

/pat-o/	*VTV	*D	IDENT[voice]
a. [pat-o]	*!		
☞ b. [pad-o]		*	*

(32)

/pad-o/	*VTV	*D	IDENT[voice]
a. [pat-o]	*!		*
☞ b. [pad-o]		*	

2.1.4 Language 4: No Contrast

- In Language 4 (33), voiced obstruents never appear; we only observe voiceless obstruents (driven by the context-free markedness constraint). This follows from the ranking in (34), where only the context-free markedness constraint ever plays a role (faithfulness is irrelevant).

(33) **Language 4: No Contrast**

Word-final	Intervocalic
/pat/ → [pat]	**/pat-o/ → [pato]**
/pad/ → [pat]	**/pad-o/ → [pato]**

(34) **No Contrast ranking**

$\mathbb{M}_{CF}$	≫	$\mathbb{M}_{CS}$	,	$\mathbb{F}$
*D	≫	*VTV	,	IDENT[voice]

- This is demonstrated with the following tableaux:

(35)

/pat/	*D	*VTV	IDENT[voice]
☞ a. [pat]			
b. [pad]	*!		*

(36)

/pad/	*D	*VTV	IDENT[voice]
☞ a. [pat]			*
b. [pad]	*!		

(37)

/pat-o/	*D	*VTV	IDENT[voice]
☞ a. [pat-o]		*	
b. [pad-o]	*!		*

(38)

/pad-o/	*D	*VTV	IDENT[voice]
☞ a. [pat-o]		*	*
b. [pad-o]	*!		

→ It will be useful to keep the analysis of these basic distributions in mind when we look at the way processes interact with reduplication.

2.2 Analyzing normal application

- Tagalog shows normal application:

(39) a. /d/ → [ɾ] / V_V
b. /d/ → [d] elsewhere (namely, #_ & C_)

(40) Flapping in Tagalog (McCarthy & Prince 1995:3; Carrier 1979:150)

	Stem	Reduplicated			Gloss
a.	datiŋ	d-um-ā-ɾatiŋ	*ɾ-um-ā-ɾatiŋ	*d-um-ā-datiŋ	'arrive'
b.	diŋat	ka-ɾiŋat-diŋat	*ka-ɾiŋat-ɾiŋat	*ka-diŋat-diŋat	'suddenly'

- This is an allophonic distribution, so we need the schema : $\mathbb{M}_{\text{CS}} \gg \mathbb{M}_{\text{CF}} \gg$ FAITH-IO

(41) Flapping ranking: *[VdV] ≫ *[ɾ] ≫ IDENT[F]-IO

- ○ [F] could be [±continuant], [±sonorant], maybe others.
- ○ If the markedness constraints were more general (i.e. not restricted to coronal place and [+voice]), other constraints would be needed to rule out alternations at other places/values for voicing.

(42) Intervocalic flapping (w/ maximally unfaithful input)

/ada/	*[VdV]	*[ɾ]	IDENT[F]-IO
a. ada	*!		
b. ☞ aɾa		*	*

(43) Non-intervocalic [d] (w/ maximally unfaithful input)

/ɾa/	*[VdV]	*[ɾ]	IDENT[F]-IO
a. ☞ da			*
b. ɾa		*!	

- **Questions:**
  1. Where must IDENT[F]-BR rank to derive normal application?
  2. What would the results be if IDENT[F]-BR ranked somewhere else?

- **Answer to Q1:** IDENT[F]-BR has to rank below *both* markedness constraints.
  - ○ This ensures that it will play no role in determining which segment appears in any given position.
  - ○ Only markedness will play a role, therefore normal application.

(44) Normal application in reduplication

/ka, RED, diŋat/	*[VdV]	*[ɾ]	IDENT[F]-IO	IDENT[F]-BR
a. ka-diŋat-diŋat	*!			
b. ka-ɾiŋat-ɾiŋat		**!	*	
c. ☞ ka-ɾiŋat-diŋat		*		*
d. ka-diŋat-ɾiŋat	*!	*	*	*

(45) Normal application in reduplication

/um, RED, datiŋ/	*[VdV]	*[ɾ]	IDENT[F]-IO	IDENT[F]-BR
a. d-um-ā-datiŋ	*!			
b. ɾ-um-ā-ɾatiŋ		**!	*	
c. ɾ-um-ā-datiŋ	*!	*		*
d. ☞ d-um-ā-ɾatiŋ		*	*	*

- What if IDENT[F]-BR ranked between the two markedness constraints?
  ⇒ **Overapplication and Back-Copying Overapplication**

(46) Back-copying overapplication

/ka, RED, diŋat/			*[VdV]	IDENT[F]-BR	*[ɾ]	IDENT[F]-IO
a.		ka-diŋat-diŋat	*!			
b.	☞	ka-ɾiŋat-ɾiŋat			**	*
c.		ka-ɾiŋat-diŋat		*!	*	
d.		ka-diŋat-ɾiŋat	*!	*	*	*

- ○ Back-copying is when a process applies normally to the reduplicant, and overapplies in the base due to BR-faithfulness.

(47) Overapplication

/um, RED, datiŋ/			*[VdV]	IDENT[F]-BR	*[ɾ]	IDENT[F]-IO
a.		d-um-ā-datiŋ	*!			
b.	☞	ɾ-um-ā-ɾatiŋ			**	*
c.		ɾ-um-ā-datiŋ	*!	*	*	
d.		d-um-ā-ɾatiŋ		*!	*	*

- What if IDENT[F]-BR ranked above the top markedness constraint?
  ⇒ Same thing — **Overapplication and Back-Copying Overapplication**

(48) Back-copying overapplication

/ka, RED, diŋat/			IDENT[F]-BR	*[VdV]	*[ɾ]	IDENT[F]-IO
a.		ka-diŋat-diŋat		*!		
b.	☞	ka-ɾiŋat-ɾiŋat			**	*
c.		ka-ɾiŋat-diŋat	*!		*	
d.		ka-diŋat-ɾiŋat	*!	*	*	*

(49) Overapplication

/um, RED, datiŋ/			IDENT[F]-BR	*[VdV]	*[ɾ]	IDENT[F]-IO
a.		d-um-ā-datiŋ		*!		
b.	☞	ɾ-um-ā-ɾatiŋ			**	*
c.		ɾ-um-ā-datiŋ	*!	*	*	
d.		d-um-ā-ɾatiŋ	*!		*	*

2.3 Analyzing overapplication

- Javanese was a case of overapplication.
  - ○ Since there is no obvious way to distinguish which copy is the base and which is the reduplicant, we don't know if it's back-copying or regular overapplication.

(50) a. /h/ → Ø / V_V
b. /h/ → [h] elsewhere (namely, _C)

(51) Javanese *h* deletion (McCarthy & Prince 1995:2)

	Stem	i. _+C	ii. _+V	iii. *"Expected" Red*	Gloss
a.	anɛh	anɛh-ku	anɛ.-e	—	'strange'
b.	bəḍah	bəḍah-bəḍah	bəḍa-bəḍa.-e	*bəḍah-bəḍa.-e	'broken'
c.	ḍajɔh	ḍajɔh-ḍajɔh	ḍajɔ-ḍajɔ.-e	*ḍajɔh-ḍajɔ.-e	'guest'

- This is a neutralizing distribution (the contrast between *h* and Ø is neutralized intervocalically, but maintained elsewhere), so we need the ranking schema: $\mathbb{M}_{CS}$ ≫ FAITH-IO ≫ $\mathbb{M}_{CF}$

(52) *h*-deletion Ranking: *[VhV] ≫ MAX[h]-IO ≫ *[h]

(53) Intervocalic *h*-deletion

/anɛh-e/	*[VhV]	MAX[h]-IO	*[h]
a. anɛhe	*!		*
b. ☞ anɛ.e		*	

(54) /h/ retained elsewhere

/anɛh-ku/	*[VhV]	MAX[h]-IO	*[h]
a. ☞ anɛhku			*
b. anɛku		*!	

- The relevant BR-faithfulness constraint is DEP-BR.
  - If this ranks above the IO-faithfulness constraint, we derive overapplication.
- This is what we saw with the ranking permutations for Tagalog:
  - We derived overapplication when the BR-faithfulness constraint outranked at least the second constraint in the ranking that determined the normal distribution.

(55) Overapplication of *h*-deletion

/RED-bəḍah-e/	*[VhV]	DEP[h]-BR	MAX[h]-IO	*[h]
a. bəḍah-bəḍah-e	*!			**
b. bəḍah-bəḍa-e		*!	*	*
c. ☞ bəḍa-bəḍa-e			*	
d. bəḍa-bəḍah-e	*!			*

- This may not actually be the clearest case though, when we scrutinize the candidates.
  - Notice that none of these constraints promote having [h] in the reduplicant when it is deleted in the base, i.e. candidate (55b).
  - Therefore, given the current other constraints, we actually don't need DEP[h]-BR: low-ranked *[h] is enough to prefer (55c).

- One constraint that *would* promote the reduplicant [h] in this scenario is MAX-**IR** (if it exists).
  - Another possibility in this particular case is ANCHOR-R-BR, because the relevant [h] is the rightmost segment of the base.

- If Max-IR exists, Dep[h]-BR ≫ Max[h]-IR will still get us the right result.

(56) Overapplication of *h*-deletion

/red-bəḍah-e/			*[VhV]	Dep[h]-BR	Max[h]-IR
a.		bəḍah-bəḍah-e	*!		
b.		bəḍah-bəḍa-e		*!	
c.	☞	bəḍa-bəḍa-e			*
d.		bəḍa-bəḍah-e	*!		*

- But Max[h]-IR must dominate *[h], or else it would not surface in the reduplicant in the general case.

(57) *h*-retention in the general case

/red-bəḍah/			*[VhV]	Dep[h]-BR	Max[h]-IO	Max[h]-IR	*[h]
a.	☞	bəḍah-bəḍah					**
b.		bəḍah-bəḍa		*!	*		*
c.		bəḍa-bəḍa			*!	*!	
d.		bəḍa-bəḍah				*!	*

2.4 Analyzing underapplication

- Underapplication can't be derived from these types of constraints alone.
  - Underapplication requires there to be another (markedness) constraint that penalizes overapplication.
  - Underapplication results when BR-faithfulness must be satisfied and that other constraint blocks overapplication.

- Akan is our example of underapplication:

(58) a. /k,h/ → [tɕ,ç] / _ ɪ
b. /k,h/ → [k,h] elsewhere

(59) Akan palatalization (M&P:3)

	Stem	Reduplicated	"Expected"	Gloss
a.	kaʔ	kɪ-kaʔ	*tɕɪ-kaʔ	'bite'
b.	hawʔ	hɪ-hawʔ	*çɪ-hawʔ	'trouble'

- M&P (1995) assume that palatalization in Akan is fully allophonic (albeit without alternations), which would require the same sort of ranking as in Tagalog.

(60) Palatalization (w/ maximally unfaithful input)

/kɪ/			*[kɪ]	*[tɕ]	Ident[F]-IO
a.		kɪ	*!		
b.	☞	tɕɪ		*	*

(61) No palatals elsewhere

/tɕa/			*[kɪ]	*[tɕ]	Ident[F]-IO
a.	☞	ka			*
b.		tɕa		*!	

- Underapplication occurs to render the base and reduplicant more similar.
  - But we don't get underapplication when we just add IDENT[F]-BR to the top of the ranking.
  - Instead we just get overapplication.

(62) Underapplication of palatalization fails

/RED, kaʔ/	IDENT[F]-BR	*[kɪ]	*[tɕ]	IDENT[F]-IO
a. ☹ kɪ-kaʔ		*!		
b. tɕɪ-kaʔ	*!		*	
c. 💣 tɕɪ-tɕaʔ			**	*

- To get underapplication, we need another constraint that penalizes the overapplication candidate.
  - M&P propose OCP-PAL, which penalizes two palatals in a row.

(63) Underapplication of palatalization succeeds

/RED, kaʔ/	OCP-PAL	IDENT[F]-BR	*[kɪ]	*[tɕ]	IDENT[F]-IO
a. ☞ kɪ-kaʔ			*		
b. tɕɪ-kaʔ		*!		*	
c. tɕɪ-tɕaʔ	*!			**	*

- Notice now that placing IDENT[F]-BR *between* the two allophonic markedness constraints rather than *above* them both reverts back to normal application.

(64) Normal application with blocker

/RED, kaʔ/	OCP-PAL	*[kɪ]	IDENT[F]-BR	*[tɕ]	IDENT[F]-IO
a. kɪ-kaʔ		*!			
b. ☞ tɕɪ-kaʔ			*	*	
c. tɕɪ-tɕaʔ	*!			**	*

2.5 General recipes for different types

(65) a. Normal application
MARKEDNESS ≫ IO-FAITHFULNESS ≫ BR-FAITHFULNESS
b. Overapplication
BR-FAITHFULNESS, MARKEDNESS ≫ IO-FAITHFULNESS
c. Underapplication
BR-FAITHFULNESS + BLOCKER ≫ MARKEDNESS ≫ IO-FAITHFULNESS

3 Templatic back-copying — is it real?

- The "Kager-Hamilton Problem"/Condundrum: Phonological properties get back-copied, but the "template" itself never gets back-copied (McCarthy & Prince 1999:258–267).

- *What would templatic back-copying look like?*
  → The base is truncated to match the shape of the partial reduplicant.

- If we observed a Diyari-like system that was subject to templatic back-copying, it would truncate the base down to two syllables to match the disyllabic reduplicant:

(66) Diyari-like reduplication with templatic back-copying (real data is from Austin 1981:38–40)

Non-reduplicated stem			Reduplicated stem			
Two syllable bases					(No difference from KHP)	
a.	‘woman’	*wilha*	*wilha-wilha*	[wíd̪l̪ʌ-wíd̪l̪ʌ]		
b.	‘to talk’	*yatha*	*yatha-yatha*	[jέt̪ʌ-jέt̪ʌ]		
c.	‘boy’	*kanku*	*kanku-kanku*	[kʌ́nku-kʌ́nku]		
Three syllable bases					(*KHP version)	
d.	bird type	*tyilparku*	*tyilpa-tyilparku*	[tʲílpʌ-tʲílpʌrku]	(**tyilpa-tyilpa*	*[tʲílpʌ-tʲílpʌ])
e.	‘mother’s mother’	*kanhini*	*kanhi-kanhini*	[kʌ́d̪n̪i-kʌ́d̪n̪ini]	(**kanhi-kanhi*	*[kʌ́d̪n̪i-kʌ́d̪n̪i])
f.	‘father’	*ngapiri*	*ngapi-ngapiri*	[ŋʌ́pi-ŋʌ́piri]	(**ngapi-ngapi*	*[ŋʌ́pi-ŋʌ́pi])
g.	‘cat fish’	*ngankanthi*	*nganka-ngankanthi*	[ŋʌ́nkʌ-ŋʌ́nkʌn̪t̪i]	(**nganka-nganka*	*[ŋʌ́nkʌ-ŋʌ́nkʌ])

- We *can* do this with the constraints we’re using:

(67) **KHP ranking:** SIZE RESTRICTOR / TEMPLATIC CONSTRAINT ≫ MAX-BR ≫ MAX-IO

(If MAX-IO ≫ MAX-BR, we go back to normal.)

(68) Deriving KHP Diyari (schematic)

INPUT: /RED, $\sigma_1\sigma_2\sigma_3\sigma_4$/ BASE: [$\acute{\sigma}_1\sigma_2\grave{\sigma}_3\sigma_4$] (1020)		*CLASH	ALIGN-ROOT-L	MAX-BR	MAX-IO
a. $\acute{\sigma}_1$-$\acute{\sigma}_1\sigma_2\grave{\sigma}_3\sigma_4$	[1-1020]	*!	*	***	
b. $\acute{\sigma}_1\sigma_2$-$\acute{\sigma}_1\sigma_2\grave{\sigma}_3\sigma_4$	[10-1020]		**	*!*	
c. ☞ $\acute{\sigma}_1\sigma_2$-$\acute{\sigma}_1\sigma_2$	[10-10]		**		**
d. $\acute{\sigma}_1\sigma_2\grave{\sigma}_3\sigma_4$-$\acute{\sigma}_1\sigma_2\grave{\sigma}_3\sigma_4$	[1020-1020]		***!*		

- There’s a problem though (maybe): given this ranking, the size restrictor outranks MAX-IO.
  - This means that we should see deletion of input material to satisfy the size restrictor.

- If it’s ALIGN-ROOT-L, then this means that the only prefix in the language is going to be reduplication.
  - The reduplicant is “protected” by MAX-BR, while fixed prefixes wouldn’t be.
  - ...Plenty of languages with prefixal reduplication seem to not have any other prefixes, only suffixes...

- If it’s general *STRUC, then the language is completely null, because it’s worse to have *anything* than to delete it.
  - ...This is why *STRUC is probably a bad idea...

- Thinking about the ramifications of the relative ranking isn’t really a consideration if we’re using RED = FT, because that’s specific to reduplication.
  - It is still a consideration with traditional GTT, since that should impose canonical shapes on all morphemes of the same category as the reduplicative morpheme.

- Spaelti (1997:38) (as cited by Caballero 2006:276) seeks to rule the KHP using a universal meta-ranking:

(69) **Spaelti’s meta-ranking:** MAX-IO ≫ SIZE RESTRICTOR ≫ MAX-BR

⋆ *Do we want to go to these lengths to rule out the KHP?*

3.1 Guarijío

- As far as I know, there has been exactly one compelling case of this sort of templatic back-copying reported in the literature: Guarijío (Uto-Aztecan, northern Mexico; Caballero 2006).

- In one of Guarijío's reduplication patterns — the inceptive — the reduplicant is a single syllable and **the base is truncated down to one syllable**, seemingly to match the reduplicant.
  - Acute accent marks position of stress. Stress seems a bit tricky in this language, but Caballero seems to think that it isn't a significant factor in this pattern.

(70) Basic cases of inceptive reduplication (Caballero 2006:278, citing Miller 1996:65–66)

	Root		Inceptive reduplication	
a.	toní	'to boil'	to-tó	'to start boiling'
b.	sibá	'to scratch'	si-sí	'to start scratching'
c.	čonó	'to fry (intr)'	čo-čó	'to start frying'
d.	nogá	'to move'	no-nó	'to start moving'
e.	kusú	'to sing (animals)'	ku-kú	'to start singing'
f.	suhku	'to scratch body'	su-sú	'to start scratching the body'
g.	muhíba	'to throw'	mu-mú	'to start throwing'

- Caballero also provides inceptive forms with "glottal prosody".
  - There's a set of roots that surface with a "glottal stop" after their first vowel (transcribed [']).
  - In inceptive reduplication, these roots have a glottal stop after the vowel of their first member.

(71) Inceptive reduplication with "glottal prosody" (Caballero 2006:278, citing Miller 1996:65–66)

	Caballero's Root UR	Root		Inceptive reduplication	
a.	/[+c.g.], pena/	pe'ná	'to gather'	pe'-pé	'to start gathering'
b.	/[+c.g.], čii/	či'í	'to suck'	či'-čí	'to start sucking'
c.	/[+c.g.], tona/	to'ná	'to knock'	to'-tó	'to start knocking'
d.	/[+c.g.], koa/	ko'á	'to eat'	ko'-kó	'to start eating'
e.	/[+c.g.], yoa/	yo'á	'to throw up'	yo'-yó	'to start throwing up'
f.	/[+c.g.], čona/	čo'ná	'to grind'	čo'-čó	'to start grinding'
g.	/[+c.g.], kiču/	ki'čú	'to bite'	ki'-kí	'to start biting'
h.	/[+c.g.], wona/	wo'ná	'to bark'	wo'-wó	'to start barking'

- The language doesn't seem to allow codas other than this "glottal stop".
  - This makes me think it's just a phonation contrast — i.e. creaky voice — possibly restricted to word-initial position.
  - → Assuming the restriction to word-initial syllables, it's not surprising that it doesn't surface in the second member (low-ranked IDENT[c.g.]-BR; doesn't tell us which member is the reduplicant).

(72) Inceptive reduplication with phonation contrast

	New Root UR	Root		Inceptive reduplication	
a.	/pḛna/	pḛná	'to gather'	pḛ-pé	'to start gathering'
b.	/čḭi/	čḭí	'to suck'	čḭ-čí	'to start sucking'
c.	/to̰na/	to̰ná	'to knock'	to̰-tó	'to start knocking'
d.	/ko̰a/	ko̰á	'to eat'	ko̰-kó	'to start eating'
e.	/yo̰a/	yo̰á	'to throw up'	yo̰-yó	'to start throwing up'
f.	/čo̰na/	čo̰ná	'to grind'	čo̰-čó	'to start grinding'
g.	/kḭču/	kḭčú	'to bite'	kḭ-kí	'to start biting'
h.	/wo̰na/	wo̰ná	'to bark'	wo̰-wó	'to start barking'

3.2 Local summary

⋆ For some reason, this pattern hasn't gained traction in the literature, and people seem to think the KHP is still a P.

- Unless someone can show why the data isn't real (which I don't think anyone has), then the KHP represents an argument *in favor of* BRCT, not an argument against.
  - → Most theories that have been proposed in response to BRCT can't derive the KHP, which they think is a good thing, but this says it's a bad thing.
  - ○ Morphological Doubling Theory (Inkelas & Zoll 2005) can derive this, as Caballero (2006) demonstrates, but MDT can get just about anything.

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