

Stress Restricts Reduplication

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1 Introduction

1.1 Reduplication and Stress

- **Partial reduplication:** “copy” some substring of a word to indicate a new morphological category.

(1) Diyari diminutive reduplication (Austin 1981 [2013]:64)

- a. *kinthala* ‘dog’ → *kintha-kinthala* ‘little dog, puppy’
- b. *wilhapina* ‘old woman’ → *wilha-wilhapina* ‘little old woman’
- c. *pirta* ‘tree’ → *pirta-pirta* ‘small tree’

- Languages vary in how much material they copy in partial reduplication.

- The Diyari pattern in (1) is consistently *disyllabic*. This is a common pattern cross-linguistically.
- Another very common pattern is *monosyllabic* reduplication, as in Sanskrit:

(2) Sanskrit perfect reduplication (forms from Whitney 1885 [1988]; see Steriade 1988, *a.o.*)

- a. $\sqrt{\text{dar-}}$ ‘pierce’ → *da-dár-a* ‘I have pierced’
- b. $\sqrt{\text{beud}^h\text{-}}$ ‘wake’ → *bū-bud^h-úr* ‘They have woken’
- c. $\sqrt{\text{paiṣ-}}$ ‘crush’ → *pī-piṣ-úr* ‘They have crushed’

- **Question:** Why does a language display some particular partial reduplication pattern, not some other one?

⇒ I will argue that the interaction between reduplication and *stress* provides answers.

- **Why should we be thinking about stress when we think about reduplicant shape?**

- Reduplicant shapes tend to look like prosodic categories: *a syllable*, *a foot* (≈ two syllables), *etc.* (McCarthy & Prince 1986 [1996], *et seq.*; see also Hyman 1985).
- Stress deals with prosodic categories, so maybe there’s a connection...

- **Observation:** Reduplicant shape appears to depend in a particular way on a language’s stress pattern.

1.2 A Typological Gap

- **Empirical claim:** Languages with the stress properties in (3) always have a disyllabic reduplicant.

- (3)
- A prohibition on stress clash (no adjacent stressed syllables)
 - A fixed stress relative to an edge with a reduplicant (e.g. initial stress and prefixal reduplicant)
 - Cyclic stress (stress in derived forms is affected by stress in their morphological bases)

- **Typological gap:** No *monosyllabic* reduplicants at the same edge as the fixed stress in these sorts of languages, despite monosyllabic reduplication being a common pattern cross-linguistically. **Why?**

- Among languages with the stress properties in (3), there are many reduplication systems like Diyari (Austin 1981 [2013]), but none like Diyari', Diyari'', or Diyari''', as shown in (4).

- ◊ Reduplicants are underlined.
- ◊ Stress indicated by acute \acute{V} (distinction between primary and secondary stress suppressed).

- The attested Diyari pattern (4.i) has a disyllabic reduplicant (stress on 1st syll, no stress on 2nd syll).
- The unattested *Diyari primes* (4.ii–iv) together represent all viable configurations of stress with a **monosyllabic reduplicant**.

- (4) Attested and unattested patterns in restrictive languages (Data from Austin 1981 [2013]:38–40)

	BASE	i. ✓ Diyari	ii. ✗ Diyari'	iii. ✗ Diyari''	iv. ✗ Diyari'''
2sylls:	$\acute{\sigma}\sigma$	<u>$\acute{\sigma}\sigma$</u> - $\acute{\sigma}\sigma$	<u>$\acute{\sigma}$</u> - $\acute{\sigma}\sigma$	σ - $\acute{\sigma}\sigma$	<u>$\acute{\sigma}$</u> - $\sigma\sigma$
	<i>yátha</i> <i>wílha</i>	<u>yátha</u> -yátha <u>wílha</u> -wílha	yá-yátha wí-wílha	ya-yátha wí-wílha	yá-yatha wí-wilha
3sylls:	$\acute{\sigma}\sigma\sigma$	<u>$\acute{\sigma}\sigma$</u> - $\acute{\sigma}\sigma\sigma$	<u>$\acute{\sigma}$</u> - $\acute{\sigma}\sigma\sigma$	σ - $\acute{\sigma}\sigma\sigma$	<u>$\acute{\sigma}$</u> - $\sigma\sigma\sigma$
	<i>tyílparku</i> <i>kánhini</i>	<u>tyílpa</u> -tyílparku <u>kánhi</u> -kánhini	tyí-tyílparku ká-kánhini	tyi-tyílparku ka-kánhini	tyí-tyilpárku ká-kanhíni
4sylls:	$\acute{\sigma}\sigma\sigma\sigma$	<u>$\acute{\sigma}\sigma$</u> - $\acute{\sigma}\sigma\sigma\sigma$	<u>$\acute{\sigma}$</u> - $\acute{\sigma}\sigma\sigma\sigma$	σ - $\acute{\sigma}\sigma\sigma$	<u>$\acute{\sigma}$</u> - $\sigma\sigma\sigma\sigma$
	<i>wílhapína</i>	<u>wílha</u> -wílhapína	wí-wílhapína	wí-wílhapína	wí-wilhápina
Problem w/ RED:		nothing	Clash (3a)	Edge (3b)	Not cyclic (3c)

⇒ This gap arises because the constraints that generate the stress properties in (3) conspire to make a monosyllabic reduplicant at the same edge as the fixed stress hopelessly ill-formed.

- ◊ This gap holds across multiple stress parameters (more on this below).

- **Intuition:** This restriction gives us some insight into how reduplicant size is calculated.

- Specifically: reduplicant size always obeys **high-ranked constraints on stress placement**.
- No languages enforce a preferred reduplicant size that leads to violations of otherwise surface-true stress considerations.

- **Why would this be?**

1.3 The Distribution of Marked Structures

- A corollary of *the emergence of the unmarked* (McCarthy & Prince 1994a; cf. McCarthy & Prince 1995, Spaelti 1997, Alderete et al. 1999):

(5) Distribution of marked structures

Marked structure allowed in base?	Yes	No
Marked structure allowed in reduplicant?	Yes	a. ✓ b. ✗
	No	c. ✓ d. ✓

- Marked structure allowed across-the-board
- *Marked structure allowed only in reduplicant** (no “emergence of the *marked*”)
- Marked structure allowed only in bases (*emergence of the unmarked*)
- Marked structure *disallowed* across-the-board

- In Optimality Theory (OT; Prince & Smolensky 1993/2004), (5a,c,d) are easily derivable.
 - Asymmetric relationship to the input between base and reduplicant: base subject to IO-Faith, reduplicant not (McCarthy & Prince 1995, *et seq.*).

- (6)
- IO-FAITH, BR-FAITH \gg MARKEDNESS
 - IO-FAITH \gg MARKEDNESS \gg BR-FAITH
 - MARKEDNESS \gg IO-FAITH, BR-FAITH

- The factorial typology of these constraint types does not permit (5b).

\Rightarrow Only the introduction of a new type of constraint – such as the *templatic constraint* – could permit (5b).

1.4 Templatic Constraints and Template Satisfaction

- The “traditional” way of explaining facts about reduplicant size/shape, specifically cases in which copying is *non-minimal*, is w/ constraints relating the reduplicant to particular prosodic/morphological categories.

(i) **Templatic Constraints**

Templatic constraints require reduplicants to be coextensive with particular **prosodic** categories, e.g. RED = FOOT or RED = PROSODICWORD (McCarthy & Prince 1993b; cf. McCarthy & Prince 1993a).

- Based on earlier approach using *underlying* prosodic templates (McCarthy & Prince 1986 [1996]).
- Templatic URs/constraints are specified as an item from the prosodic hierarchy (*syllable, foot, prosodic word*), or some particular type of one of those items (*light syllable, heavy syllable, “core syllable”*):

(7) Prosodic Categories for Templates (McCarthy & Prince 1986 [1996]:6)

Wd	‘prosodic word’
F	‘foot’
σ	‘syllable’
σ_{μ}	‘light (monomoraic) syllable’
$\sigma_{\mu\mu}$	‘heavy (bimoraic) syllable’
σ_c	‘core syllable’ [= (C)V]

- “**Generalized Template Theory**” (GTT): Constraints dictate that reduplicants be interpreted as particular **morphological** categories, namely RED = STEM, with constraints on the realization of stems leading to non-minimality (McCarthy & Prince 1994a,b, 1995, *et seq.*, Urbanczyk 1996, 2001).

(ii) “A-templatic” Reduplication

There are no templatic constraints;¹ only independently necessary constraints can induce non-minimality (cf. Spaelti 1997, Gafos 1998, Riggle 2006, *a.o.*).

- Minimality is the default, driven by “size restrictor” constraints that penalize additional material in the reduplicant (Spaelti 1997, Hendricks 1999, *a.o.*).
- Extension can be motivated by prosodic constraints like *CLASH, segmental phonotactics like OCP.

⇒ I’ll ultimately be advocating for a version of the a-templatic approach (ii), though there will still be residue that’s hard to explain.

- But the best way to understand why this is the optimal framework is to see how templatic constraints would have to interact with the grammar.

- **Question:** If the grammar has templatic constraints (or other constraints directly relating to reduplicant shape), how can they be ranked, how are they satisfied?

- McCarthy & Prince (1993b) propose the “Template Satisfaction Condition”:

(8) **Template Satisfaction Condition** (McCarthy & Prince 1993b:110,145)

- Clause 1:* Templatic constraints may be **undominated**, in which case they are satisfied fully.
- Clause 2:* Templatic constraints may be **dominated**, in which case they are violated minimally, in accordance with general principles of OT.

- **Generalization:** Templatic morphology never induces violations of otherwise surface-true phonotactics.
- ◇ Therefore, Clause 1 is problematic: an undominated templatic constraint could introduce an otherwise prohibited marked structure into the reduplicant.

- For example, a language that generally has only open syllables (i.e. no codas) could have a templatic constraint requiring a heavy syllable, forcing codas to appear in the reduplicant:

(9) Hypothetical unattested: RED = $\sigma_{\mu\mu}$ >> NOCODA >> IO-FAITH

- pa.ta.ka* → pat.-*pa.ta.ka*
- **pat.ka* → *pat.-*pat.ka*

- Pima (Riggle 2006), in (10), represents a typical case where phonotactics override size preferences; Pima’ (11), where size preferences override phonotactics, is not attested. (See also Yates 2017 on Cupeño.)

- Pima generally has a minimal reduplicant, C (infix after first V) (10a) – induced by *size restrictor*.
- When copying just C would result in violation of important phonotactics (e.g. ban on coda laryngeal consonants), an extra V is copied too (10b).

(10) Pima: *LAR]_σ >> SIZE RESTRICTOR (>>) IO-FAITH

- mavit* ‘lion’ → *ma-m-vit* ‘lions’
- hodai* ‘rock’ → *ho-ho-dai* ‘rocks’ (**ho-h-dai*) *LAR]_σ

(11) *Pima’: SIZE RESTRICTOR >> *LAR]_σ >> IO-FAITH

- hodai* → *ho-h-dai* (**ho-ho-dai*)
- **hohdai*

¹On this, see also my work on “templatic” effects in Arabic nonconcatenative morphology (Zukoff 2016, in prep).

- ◇ The gap discussed above – no monosyllabic reduplication at same edge as fixed stress in cyclic, clash avoiding languages – is equivalent to the Pima case, but with *prosodic* rather than *segmental* phonotactics.
- ⇒ Regardless of the approach to reduplicant shape, we need to place some **condition on the operation of constraints on reduplicant shape** in order to properly account for the facts.

1.5 Proposal

- **Provisional implementation:** Impose a meta-ranking condition on grammars:

- Within an OT approach to stress and reduplication, the distribution of reduplicant shapes can be modeled by a meta-ranking condition on two types of constraints:

(12)

- a. Constraints enacting size preferences for the reduplicant: “REDSIZE” or “**R**” constraints
- b. Constraints enacting stress requirements (i.e. unviolated stress constraints): “STRESSREQ” or “**S**” constraints

- The typological gap is predicted if there is an *a priori* ranking of STRESSREQ constraints over REDSIZE constraints:

(13) Stress-Reduplication Meta-Ranking: STRESSREQ \gg REDSIZE (**S** \gg **R**)

- If the reverse ranking were permitted, we predict languages with fixed reduplicant shapes that countermand the language’s stress properties.
- ⇒ It is precisely this situation which seems not to be attested.
- **Possible extension:** The constraints that enact size preferences for the reduplicant are always subordinated to otherwise surface-true **phonotactics** of any kind, be they segmental or prosodic.
- **Long term goal:** Have this condition emerge without stipulation over rankings.
 - ◇ *Possible avenue for explanation* – it emerges as a by-product of the learning/acquisition process: e.g. how much data learners get about different patterns (and when), what learners attend to (when).

1.6 Roadmap

- **Section 2:** Stress directly generates a fixed disyllabic reduplicant in Australian languages with a certain stress profile.
 - Typological evidence shows that the unrestricted interaction between stress constraints and templatic constraints leads to over-generation.
 - The **S** \gg **R** meta-ranking properly regulates this interaction in order to avoid over-generation.
- **Section 3:** Prosodically-variable yet predictable reduplication in Ponapean (Rehg & Sohl 1981) can also be reduced directly to the interaction of stress constraints and phonotactics, given the **S** \gg **R** meta-ranking.
- **Section 4:** An apparent counter-example to the typological generalization regarding Australian languages, Ngan’gityemerri (Reid 2011), actually perfectly conforms to the **S** \gg **R** meta-ranking.
- **Section 5:** Ramifications and interpretations of the **S** \gg **R** meta-ranking; explore the idea that the set of data examined might be better explained without any reference to templates at all.

While much of the discussion will be framed in terms of the **S** >> **R** meta-ranking, the broader takeaway is that patterns of reduplicant shape can be driven by prosodic markedness constraints, and obey the generalizations about where marked structures can and cannot occur.

2 Reduplication in Australian languages and the over-generation problem

- Australian languages commonly display quantity insensitive left-to-right alternating stress (QI L→R) without stressed final syllables (left-to-right syllabic trochees, in foot-based terms).
 - Many also display cyclic stress (Poser 1989, Crowhurst 1994, Kenstowicz 1998, Berry 1998, Alderete 2009, Stanton 2014).
 - Typological survey: when these languages display prefixal partial reduplication, **it is always disyllabic**.
- ⇒ This property follows from the **S** >> **R** meta-ranking.

Section Roadmap

- Exemplify the stress system; show how to analyze it.
- Show that the stress system generates the reduplication pattern.
- Support the typological generalizations with a survey.
- Connect generalizations to the **S** >> **R** meta-ranking.

2.1 Diyari Stress

- One of the most well-studied of these Australian languages is Diyari (Austin 1981 [2013]). It will serve here as the representative example for this pattern of stress and reduplication.
- In monomorphemic forms, Diyari displays the basic QI L→R pattern, as illustrated by the data in (14):

(14) Diyari simplex stress (Austin 1981 [2013]:38–40)

- a. 2 syllables: **óσ** — *wílha* ‘woman’, *kánku* ‘boy’, *yátha* ‘to talk’
- b. 3 syllables: **óσσ** — *pínarru* ‘old man’, *tyílparku* (bird type), *kánhini* ‘mother’s mother’
- c. 4 syllables: **óσòσ** — *ngándrawàlka* ‘to close’, *wílhapìna* ‘old woman’

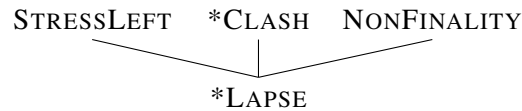
- In a foot-free stress framework, the stress behavior of Diyari (and other QI L→R stress languages) can be modeled with the constraints in (15):

(15) Foot-free stress constraints for QI L→R cyclic stress systems (based in part on Gordon 2002)


- a. **STRESSLEFT**: Assign one * if the initial syllable is not stressed. (= *#ò)
- b. **NONFINALITY**: Assign one * if the word-final syllable is stressed. (= *ó#)
- c. ***CLASH**: Assign one * for each sequence of two adjacent stressed syllables. (= *óó)
- d. ***LAPSE**: Assign one * for each sequence of two adjacent unstressed syllables. (= *òò)

- The ranking of these constraints shown in (16), where *LAPSE is the only dominated constraint, generates the basic stress pattern of Diyari and other similar languages, as demonstrated in tableau (17).

(16) Simplex stress ranking in Diyari



(17) Stress in 3 syllable simplex words: Diyari /pɪnaru/ → [pɪnaru] ‘old man’ (Austin 1981 [2013]:39)

/pɪnaru/	STRESSLEFT	*CLASH	NONFINALITY	*LAPSE
a.  pɪnaru [100]				*
b. pɪnaru [102]			*!	
c. pɪnaru [120]		*!		
d. pɪnaru [010]	*!			

- In three syllable words, (at least) one of the four constraints **must** be violated. Diyari chooses to violate *LAPSE, as in optimal candidate (17a).
 - Candidate (17b): avoids lapse by stressing the final syllable; violates NONFINALITY.
 - Candidate (17c): avoids lapse by stressing second syllable; violates *CLASH.
 - Candidate (17d): avoids lapse by stressing medial syllable not initial; violates STRESSLEFT.
- The data in (18) demonstrates that Diyari stress is cyclic.
 - The stress pattern of a morphological base must be adhered to in its morphological derivatives, even if this leads to new violations of markedness constraints.

(18) Diyari cyclic stress (a,b from Austin 1981 [2013]:40, c,d from Berry 1998:39)

- a. i. ‘man’ *kárna*
 ii. ‘man-LOC’ *kárna-nhi*
 iii. ‘man-LOC-IDENT’ *kárna-nhi-màtha* (not **kárna-nhi-matha*)
- b. i. ‘man’ *kárna*
 ii. ‘man-PL’ *kárna-wàra*
 iii. ‘man-PL-LOC’ *kárna-wàra-ngu*
 iv. ‘man-PL-LOC’ *kárna-wàra-ngu-màtha* (not **kárna-wàra-ngù-matha*)
- c. ‘hill-CHARAC-PROP’ *máda-la-nthu* (not **máda-là-nthu*) [presumed bases: *máda*, *máda-la*]
 d. ‘mud-LOC’ *púlyudu-nhi* (not **púlyudù-nhi*) [presumed base: *púlyudu*]
 (cf. simplex (14c): *ngándrawàlka*, not **ngándrawalka*)

- This behavior can be explained by the Base-Derivative faithfulness constraint (following Benua 1997; see also Stanton 2014) defined in (19):

(19) **BD-IDENT(stress)**: Assign one * for each syllable in the derivative in which the presence or absence of stress differs from the corresponding syllable of the base.

- When this constraint is ranked above *LAPSE (just as the other constraints needed to be to explain the simplex pattern), it derives the cyclic behavior, especially in concert with NONFINALITY:²

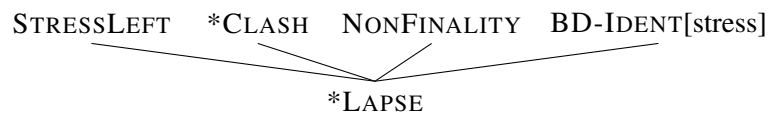
²The combination of BD-IDENT(stress) and NONFINALITY make it such that (i) no root-final syllables ever bear stress, because they are word-final in simplex forms, and (ii) no monosyllabic suffixes ever bear stress, because they are word-final when they are the rightmost suffix.

(20) Cyclic stress: Diyari /mada-la-ntu/ → [má.dΛ-lΛ-n̩̩.tu] ‘hill-CHARAC-PROP’ (Berry 1998:39)

INPUT: /mada-la- <u>ntu</u> /	NONFINALITY	BD-IDENT[stress]	*LAPSE
BASE: [má.dΛ-lΛ]			
a. má.dΛ-lΛ- <u>n̩̩</u> .tu [10-0-0]			**
b. má.dΛ-l̩̩- <u>n̩̩</u> .tu [10-2-0]		*!	
c. má.dΛ-lΛ- <u>n̩̩</u> .tù [10-0-2]	*!		*

- The double lapse in optimal candidate (20a) is forced by the requirement to retain the same stress values as the base ([má.dΛ-lΛ]), namely that the first suffix [-lΛ] was *unstressed* (due to NONFINALITY).
- This yields the total stress ranking in (21):

(21) Total stress ranking in Diyari



- Recall that the **S** >> **R** hypothesis consists of two pieces: (i) the identification of two constraint meta-categories (22), and (ii) a meta-ranking condition on those two categories (23).

(22) a. “REDSIZE” (**R**): Constraints enacting size preferences for the reduplicant
 b. “STRESSREQ” (**S**): Constraints enacting stress requirements (unviolated stress constraints)

(23) Stress-Reduplication Meta-Ranking: STRESSREQ >> REDSIZE (**S** >> **R**)

- With this in mind, we can identify Diyari’s “STRESSREQs” based on the ranking in (21):

(24) STRESS REQUIREMENTS in Diyari: STRESSLEFT, *CLASH, NONFINALITY, BD-IDENT[stress]

- The STRESSREQ constraints will, on their own, be sufficient to generate the disyllabic reduplication pattern, when incorporated into the **S** >> **R** structure.

2.2 How stress determines Diyari reduplication

- Diyari, like many other Australian languages, has a consistent prefixal disyllabic reduplication pattern (Austin 1981 [2013]; for analyses see McCarthy & Prince 1986 [1996], 1994a,b, *et seq.*). The pattern is illustrated in (25):

(25) Diyari Reduplication (Austin 1981 [2013]:38–40)

Non-reduplicated stem		Reduplicated stem	
Two syllable bases			
a. ‘woman’	<i>wilha</i>	<i>wilha-wilha</i>	[wídl̩̩-l̩̩-wídl̩̩]
b. ‘to talk’	<i>yatha</i>	<i>yatha-yatha</i>	[jé̩̩t̩̩-l̩̩-jé̩̩t̩̩]
c. ‘boy’	<i>kanku</i>	<i>kanku-kanku</i>	[ká̩̩nku-ká̩̩nku]
Three syllable bases			
d. bird type	<i>tyilparku</i>	<i>tyilpa-tyilparku</i>	[t̩̩ílp̩̩-l̩̩-t̩̩ílp̩̩rk̩̩]
e. ‘mother’s mother’	<i>kanhini</i>	<i>kanhi-kanhini</i>	[ká̩̩dn̩̩-l̩̩-ká̩̩dn̩̩n̩̩]
f. ‘father’	<i>ngapiri</i>	<i>ngapi-ngapiri</i>	[ŋá̩̩p̩̩-l̩̩-ŋá̩̩p̩̩ri]
g. ‘cat fish’	<i>ngankanthi</i>	<i>nganka-ngankanthi</i>	[ŋá̩̩nk̩̩-l̩̩-ŋá̩̩nk̩̩t̩̩h̩̩]

- If we follow the **S** \gg **R** meta-ranking, and subordinate any and all constraints dictating the size of the reduplicant to the STRESSREQs enumerated in (24), we derive this disyllabic reduplicant before any REDSIZE constraints can enter into the evaluation.

◊ I include both $RED = \sigma$ and $RED = 2\sigma$ ($\approx RED = FOOT$) as REDSIZE constraints for illustrative purposes, though *any* REDSIZE constraint – templatic or otherwise – would make the same point: they play no role here.

(26) Schematic Diyari reduplication according to **S** \gg **R**

INPUT: /RED, $\sigma\sigma\sigma\sigma$ /		*CLASH	STRESSL	BD-ID[stress]	RED = σ	RED = 2σ
BASE: [$\acute{\sigma}\sigma\grave{\sigma}$] (1020)						
a. $\acute{\sigma}\sigma\grave{\sigma}\grave{\sigma}$ [10-1020]					*	✓
b. $\acute{\sigma}\acute{\sigma}\grave{\sigma}\grave{\sigma}$ [1-1020]		*!			✓	*
c. $\sigma\acute{\sigma}\sigma\grave{\sigma}$ [0-1020]			*!		✓	*
d. $\acute{\sigma}\sigma\grave{\sigma}\sigma$ [1-0200]				*!***	✓	*

- Any candidate w/ a monosyllabic reduplicant incurs a fatal violation of one of the STRESSREQ constraints.
 - Candidate (26b): faithful to base stress, stresses leftmost syllable; but **creates a clash**.
 - Candidate (26c): faithful to base stress, no clash; but **doesn't stress leftmost syllable**.
 - Candidate (26d): stresses leftmost syllable, no clash; but **re-stresses base**.
- Adding an extra “buffer” syllable to the reduplicant escapes all of these problems.
 - Candidate (26a) can stress the initial syllable without causing a clash or re-stressing the base.

As long as the templatic constraints (i.e. REDSIZE constraints) are subordinated to the STRESSREQs, they play no role in the evaluation.

- Since this is a disyllabic (\approx foot) “template,” the same result would obtain from having $RED = 2\sigma$ at the top of the ranking, regardless of the stress constraints.
 - Such a ranking would be an example of Clause 1 of the Template Satisfaction Condition (8a).
 - But, as just demonstrated, the templatic constraint is *not necessary* to generate the pattern.
- But, if we took this approach to the disyllabism – where a REDSIZE constraint is undominated – we predict languages where $RED = \sigma$ is highest ranked instead.
 - If $RED = \sigma$ can be freely ranked with respect to the Diyari STRESSREQs, we (over-)generate (at least) three **unattested** patterns.
 - These patterns' unattested status is confirmed by a systematic survey of Australian languages with Diyari-like stress systems.

◊ Though not yet systematically surveyed, a number of languages outside of Australian, which differ along various stress parameters, also support the broader generalization that reduplicant shape doesn't override basic stress considerations.

2.3 The typology of reduplication systems with freely rankable RED = σ

- If RED = σ were freely rankable w.r.t. the STRESSREQ constraints of the cyclic QI L→R stress systems represented by Diyari (STRESSL, *CLASH, BD-IDENT[stress]), we would expect (at least) the four patterns in (27).
- These four patterns correspond to the four candidates in tableau (26), which themselves correspond to the patterns presented above in (4) as Diyari and the *Diyari primes*, respectively.

(27) Unrestrained reduplication typology

- Candidate (26a) $\acute{\sigma}\sigma\text{-}\acute{\sigma}\sigma\grave{\sigma}$ [10-1020] = Diyari
Would win if : STRESSL, *CLASH, BD-IDENT[stress] \gg RED = σ
- Candidate (26b) $\acute{\sigma}\text{-}\acute{\sigma}\sigma\grave{\sigma}$ [1-1020] = *Diyari'
Would win if : RED = σ \gg *CLASH
- Candidate (26c) $\underline{\sigma}\text{-}\acute{\sigma}\sigma\grave{\sigma}$ [0-1020] = *Diyari''
Would win if : RED = σ \gg STRESSL
- Candidate (26d) $\acute{\sigma}\text{-}\sigma\grave{\sigma}\sigma$ [1-0200] = *Diyari'''
Would win if : RED = σ \gg BD-IDENT[stress]

- We have already seen that the first pattern is attested in Diyari. The question is: **which of these other patterns are attested in other languages with a Diyari-like stress system?**
- I conducted a survey to address this question, looking for cyclic QI L→R Australian languages.³
 - I discarded those languages without evidence of prefixal partial reduplication and without (some) evidence of cyclic stress (as well as those which were not truly QI L→R).
 - This search yielded 12 Australian languages (including Diyari) with prefixal partial reduplication and cyclic QI L→R stress:

(28) Cyclic QI L→R languages with prefixal reduplication:

Arabana-Wangkangurru (Hercus 1994), Bagandji (Hercus 1982), Diyari (Austin 1981 [2013]), Dyirbal (Dixon 1972), Kalkatungu (Blake 1979a), Mayi (Breen 1981), Pitta Pitta (Blake 1979b), Walmatjari (Hudson 1978), Wambaya (Nordlinger 1998), Warlpiri (Nash 1980), Warrwa (McGregor 1994), Wirangu (Hercus 1999)

- Among these languages, the only attested prefixal partial reduplication pattern is indeed the disyllabic pattern (27.i).
- ⇒ The monosyllabic patterns (27.ii–iv) are all **unattested** in the surveyed languages.
- Monosyllabic reduplication is very common cross-linguistically, so this gap is quite surprising.
 - ◇ One seeming counterexample, Ngan'gityemerri (Reid 2011) (§4 below), will turn out to be the exception that proves the rule.

³The initial list was assembled based on Gordon's (2002) survey of quantity insensitive languages, and was supplemented by searching of WALS (wals.info). Of the languages on this list, I was able to access data for a large majority. These were accessed through a number of means available through MIT Libraries (MIT Hayden Library, Boston Library Consortium, Borrow Direct, Inter-Library Loan) and freely available electronic resources. In most cases, the data was drawn directly from fieldwork grammars.

- There is a common link that characterizes the unattested monosyllabic patterns (27.ii–iv) to the exclusion of the attested disyllabic pattern (27.i):
 - In each of these rankings, $RED = \sigma$ dominates one of the STRESSREQs.
 - This ranking possibility can thus be identified as the locus of over-generation.

⇒ By instituting the **S** >> **R** meta-ranking, we prohibit exactly this set of rankings, and avoid the over-generation problem.

2.4 Interim conclusions

- A survey of QI L→R cyclic stress systems in Australian languages has revealed that all such languages conform to the **S** >> **R** meta-ranking hypothesis.
 - In these systems, preferences for reduplicant shape are invariably subordinated to the stress requirements of the language.
 - In the case of cyclic QI L→R systems, this means that **monosyllabic** prefixal reduplication is **impossible**.
- ⇒ By enforcing the meta-ranking of STRESSREQ >> REDSIZE, we capture all of the attested patterns and prohibit the unattested but otherwise logically possible patterns.

NB: The disyllabic shape is the minimal reduplicant length that can satisfy all the stress STRESSREQs. Therefore, this result holds whether REDSIZE constraints are *templatic* constraints, or rather a-templatic *size restrictor* constraints.

3 Ponapean

- In Australian prefixal reduplication, fixed-stress placement restricts the possible reduplication patterns that may occur at the same edge as the fixed stress.
- Ponapean (Austronesian; Rehg & Sohl 1981, Rehg 1993) represents an example of fixed stress and reduplication occurring at opposite ends of the word: rightmost stress, leftmost reduplication.
 - The fact that Ponapean has *strictly alternating* stress brings it within the scope of the present discussion.
- Ponapean reduplicant size is *prosodically-variable*, but *predictable*.
 - This comes about because REDSIZE constraints are subordinated to the stress constraints that demand alternating rhythm, in addition to the constraints that demand fixed stress.

Section Roadmap

- Exemplify and analyze the stress system.
- Demonstrate that the interaction of stress requirements and phonotactics explains variability in reduplicant shape.
- Show that the analysis supports the **S** >> **R** meta-ranking.

3.1 Ponapean Stress

- In Ponapean, the rightmost mora always bears primary stress (Rehg 1993; Kennedy 2002:223), assuming final consonants are non-moraic. (Medial codas are moraic.)

(29) **STRESSR_μ**: Assign one * if the final mora is unstressed.

(= **μ*#)

- Counting leftward from this main stress, there is strictly alternating stress by mora:

- (30) a. *CLASH_μ: Assign one * for each sequence of two adjacent stressed moras. (= *μ̂μ̂)
 b. *LAPSE_μ: Assign one * for each sequence of two adjacent unstressed moras. (= *μ̃μ̃)

- Predictable difference in the stress of the initial mora of a word depending on its moraic parity:

- (31) i. **Odd moraic parity words will have stress on the initial mora:**
 1μ: *pá*; 3μ: *lì.aán, dùupék*
 ii. **Even moraic parity words will not have stress on the initial mora:**
 2μ: *duné, dilíp*; 4μ: *ri.àalá, toòroór, soùpisék*; 6μ: *waàntùuké*

- This difference will be crucial in explaining the distribution of reduplicant shapes.

3.2 Ponapean Reduplication

- Kennedy (2002) (building on McCarthy & Prince 1986 [1996]) shows that the data can be grouped based on mora count of the stem and mora count of the reduplicative prefix.

- (32) Ponapean reduplication (Kennedy 2002:225)

	1-mora stem	2-mora stem	3-mora stem	4-mora stem
2-mora reduplicant	<u>pàa</u> .pá	<u>duh̃</u> _μ .du.né	<u>dùu</u> .dùu.pék	<u>rî</u> .ri.àa.lá
	<u>tè.pi</u> .tép	<u>si.pì</u> .si.péd	<u>mèe</u> .mèe.lél	
	<u>dòn</u> _μ .dód	<u>diñ</u> _μ .di.líp	<u>hì</u> .lì.aán	
1-mora reduplicant		<u>dù</u> .duúp		<u>tò</u> .toò.roór <u>sò</u> .soù.pi.sék

- Also one example of a 6μ stem: *waàn.tùu.ké* → wà.*waàn.tùu.ké* (Kennedy 2002:224)

- The key to explaining the pattern: **the reduplicant must always bear a stress** (Kennedy 2002:225–226)

- (33) **STRESS-TO-RED**: All reduplicants must have at least one stressed mora.

- This potentially conflicts with undominated *CLASH_μ for **odd parity** stems.
 - Odd parity stems have initial stress due to the alternating rhythm (31.i).
 - If the reduplicant were monomoraic, and bore its required stress, then there would be a **clash**.
 - To avoid this, odd parity stems always have **bimoraic reduplicants**:⁴

- (34) Odd parity stems have bimoraic reduplicants
- pá*_μ → pàa_μ.*pá*_μ (not *pà_μ.*pá*_μ)
 - tép*_μ → tè.pi_μ.*tép*_μ (not *tè_μ.*tép*_μ)
 - dód*_μ → dòn_μ.*dód*_μ (not *dò_μ.*dód*_μ)
 - hì.a.á*_μ*n* → hì.i_μ.*hì.a.á*_μ*n* (not *hì_μ.*hì.a.á*_μ*n*)
 - dùu.pé*_μ*k* → dùu_μ.*dùu.pé*_μ*k* (not *dù_μ.*dùu.pé*_μ*k*)

⁴The difference in outcomes of the bimoraic reduplicant (for any stem parity) is driven by phonotactic restrictions on possible codas. I will not provide a full analysis here – see Kennedy (2002) for details.

(35) Odd parity stems → bimoraic reduplicants: (34d) $\underline{\text{li}}_{\mu}.\text{a}_{\mu}\acute{\text{a}}_{\mu}\text{n} \rightarrow \underline{\text{li}}_{\mu}\text{i}_{\mu}-\underline{\text{li}}_{\mu}.\text{a}_{\mu}\acute{\text{a}}_{\mu}\text{n}$

/RED, $\text{li}_{\mu}\text{a}_{\mu}\text{a}_{\mu}\text{n}$ /	STRESS-TO-RED	*CLASH $_{\mu}$	RED = μ	RED = 2 μ
a. $\underline{\text{li}}_{\mu}-\underline{\text{li}}_{\mu}.\text{a}_{\mu}\acute{\text{a}}_{\mu}\text{n}$ [0-201]	*!		✓	*
b. $\underline{\text{li}}_{\mu}-\underline{\text{li}}_{\mu}.\text{a}_{\mu}\acute{\text{a}}_{\mu}\text{n}$ [2-201]		*!	✓	*
c. $\underline{\text{li}}_{\mu}\text{i}_{\mu}-\underline{\text{li}}_{\mu}.\text{a}_{\mu}\acute{\text{a}}_{\mu}\text{n}$ [20-201]			*	✓

- Even parity stems are unencumbered by the clash problem.
 - The alternating rhythm places stress on the peninitial mora, rather than the initial one (31.ii).
 - This means that a monomoraic reduplicant can be stressed without ever causing a clash.
- This is indeed the case: even parity stems *with a (super)heavy initial syllable* have a **monomoraic reduplicant** – the preferred reduplicant shape.

(36) Heavy-syllable–initial even parity stems have monomoraic reduplicants

- a. $\text{du}_{\mu}\acute{\text{u}}_{\mu}\text{p} \rightarrow \underline{\text{dù}}_{\mu}-\text{du}_{\mu}\acute{\text{u}}_{\mu}\text{p}$ (not $*\underline{\text{dù}}_{\mu}\text{u}_{\mu}-\text{du}_{\mu}\acute{\text{u}}_{\mu}\text{p}$, $*\underline{\text{du}}_{\mu}\text{ù}_{\mu}-\text{du}_{\mu}\acute{\text{u}}_{\mu}\text{p}$)
- b. $\text{to}_{\mu}\grave{\text{o}}_{\mu}.\text{ro}_{\mu}\acute{\text{o}}_{\mu}\text{r} \rightarrow \underline{\text{tò}}_{\mu}-\text{to}_{\mu}\grave{\text{o}}_{\mu}.\text{ro}_{\mu}\acute{\text{o}}_{\mu}\text{r}$ (not $*\underline{\text{tò}}_{\mu}\text{o}_{\mu}-\text{to}_{\mu}\grave{\text{o}}_{\mu}.\text{ro}_{\mu}\acute{\text{o}}_{\mu}\text{r}$, $*\underline{\text{to}}_{\mu}\grave{\text{o}}_{\mu}-\text{to}_{\mu}\grave{\text{o}}_{\mu}.\text{ro}_{\mu}\acute{\text{o}}_{\mu}\text{r}$)
- c. $\text{so}_{\mu}\grave{\text{u}}_{\mu}.\text{pi}_{\mu}.\text{sé}_{\mu}\text{k} \rightarrow \underline{\text{sò}}_{\mu}-\text{so}_{\mu}\grave{\text{u}}_{\mu}.\text{pi}_{\mu}.\text{sé}_{\mu}\text{k}$ (not $*\underline{\text{sò}}_{\mu}\text{u}_{\mu}-\text{so}_{\mu}\grave{\text{u}}_{\mu}.\text{pi}_{\mu}.\text{sé}_{\mu}\text{k}$, $*\underline{\text{so}}_{\mu}\grave{\text{u}}_{\mu}-\text{so}_{\mu}\grave{\text{u}}_{\mu}.\text{pi}_{\mu}.\text{sé}_{\mu}\text{k}$)
- d. $\text{wa}_{\mu}\grave{\text{a}}_{\mu}\text{n}_{\mu}.\text{tù}_{\mu}\text{u}_{\mu}.\text{ké}_{\mu} \rightarrow \underline{\text{wà}}_{\mu}-\text{wa}_{\mu}\grave{\text{a}}_{\mu}\text{n}_{\mu}.\text{tù}_{\mu}\text{u}_{\mu}.\text{ké}_{\mu}$
 (not $*\underline{\text{wà}}_{\mu}\text{a}_{\mu}-\text{wa}_{\mu}\grave{\text{a}}_{\mu}\text{n}_{\mu}.\text{tù}_{\mu}\text{u}_{\mu}.\text{ké}_{\mu}$, $*\underline{\text{wa}}_{\mu}\grave{\text{a}}_{\mu}-\text{wa}_{\mu}\grave{\text{a}}_{\mu}\text{n}_{\mu}.\text{tù}_{\mu}\text{u}_{\mu}.\text{ké}_{\mu}$)

NB: The preference for monomoraic reduplication could be implemented using a templatic constraint (RED = μ), but it also follows from the *size restrictor* approach, as it is minimal.

- When an even parity stem begins with a *light* initial syllable, it displays a bimoraic reduplicant, contrary to the preferred monomoraic shape, despite not needing it for clash purposes.

(37) Light-syllable–initial even parity stems have bimoraic reduplicants

- a. $\text{du}_{\mu}.\text{né}_{\mu} \rightarrow \underline{\text{du}}_{\mu}\grave{\text{n}}_{\mu}-\text{du}_{\mu}.\text{né}_{\mu}$ (not $*\underline{\text{dù}}_{\mu}-\text{du}_{\mu}.\text{né}_{\mu}$)
- b. $\text{dí}_{\mu}.\text{lí}_{\mu}\text{p} \rightarrow \underline{\text{dì}}_{\mu}\grave{\text{n}}_{\mu}-\text{dí}_{\mu}.\text{lí}_{\mu}\text{p}$ (not $*\underline{\text{dì}}_{\mu}-\text{dí}_{\mu}.\text{lí}_{\mu}\text{p}$)
- c. $\text{si}_{\mu}.\text{pé}_{\mu}\text{d} \rightarrow \underline{\text{sì}}_{\mu}\grave{\text{p}}_{\mu}-\text{si}_{\mu}.\text{pé}_{\mu}\text{d}$ (not $*\underline{\text{sì}}_{\mu}-\text{si}_{\mu}.\text{pé}_{\mu}\text{d}$)
- d. $\text{ri}_{\mu}.\grave{\text{a}}_{\mu}\text{a}_{\mu}.\text{lá}_{\mu} \rightarrow \underline{\text{rì}}_{\mu}\grave{\text{i}}_{\mu}-\text{ri}_{\mu}.\grave{\text{a}}_{\mu}\text{a}_{\mu}.\text{lá}_{\mu}$ (not $*\underline{\text{rì}}_{\mu}-\text{ri}_{\mu}.\grave{\text{a}}_{\mu}\text{a}_{\mu}.\text{lá}_{\mu}$)

- The variation within even parity stems is not stress-related, but instead due to a phonotactic restriction:
 - A monomoraic reduplicant here would lead to two identical light (i.e. monomoraic) syllables next to each other.
 - Therefore, a constraint which bans adjacent identical light syllables generates the data.⁵
- I propose to use a version of Yip's (1995) *REPEAT constraint:

(38) *REPEAT(light): No identical adjacent light syllables.

⁵The restriction to light syllables is crucial here, since, in trimoraic stems with an initial long vowel, the reduplicant is identical to the first syllable of the root: e.g. (34e) $\text{dù}_{\mu}\text{u}_{\mu}.\text{pé}_{\mu}\text{k} \rightarrow \underline{\text{dù}}_{\mu}\text{u}_{\mu}-\text{dù}_{\mu}\text{u}_{\mu}.\text{pé}_{\mu}\text{k}$, not $*\underline{\text{du}}_{\mu}\text{ù}_{\mu}\text{pi}_{\mu}-\text{dù}_{\mu}\text{u}_{\mu}.\text{pé}_{\mu}\text{k}$. A general constraint against all sorts of adjacent identical syllables would rule out such forms, and thus is not the formulation we want.

- Kennard (2004) employs this constraint (without the restriction to light syllables) in her analysis of durative reduplication in Tawala.
 - Tawala is an Austronesian language related to Ponapean (both are in the Oceanic sub-group).
 - Given that the Ponapean reduplication pattern under discussion is indeed the durative, this serves as comparative evidence for the use of such a constraint in the analysis.
- The ranking $*REPEAT(light) \gg RED = \mu$ causes light-syllable-initial roots to extend their reduplicants to two moras, but has no effect on heavy-syllable-initial roots.

(39) Light-syllable-initial even parity stems \rightarrow $*REPEAT$ effect: (37d) $ri_\mu \cdot \grave{a}_\mu a_\mu \cdot lá_\mu \rightarrow ri_\mu \grave{i}_\mu - ri_\mu \cdot \grave{a}_\mu a_\mu \cdot lá_\mu$

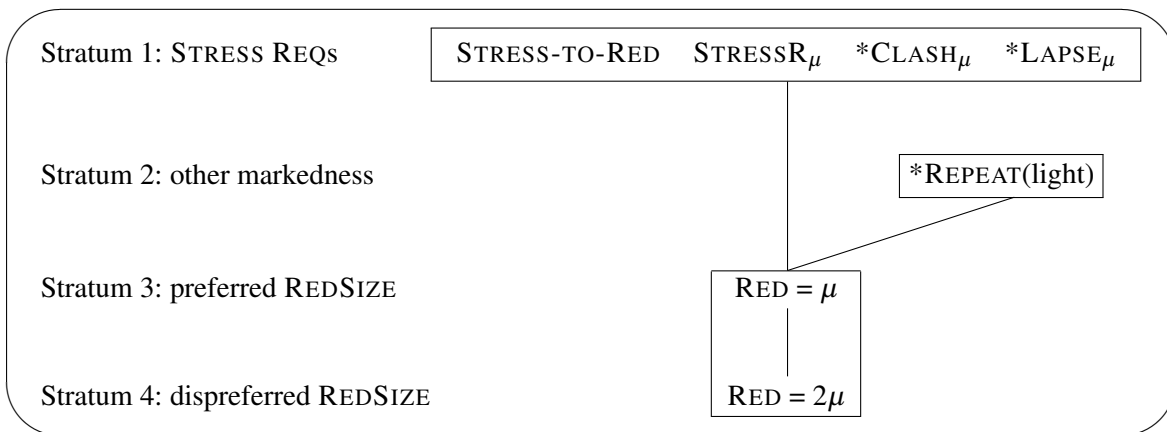
/RED, $ri_\mu a_\mu a_\mu lá_\mu$ /	STRESS-TO-RED	$*LAPSE_\mu$	$*REPEAT$ (light)	RED = μ	RED = 2μ
a. $\underline{ri}_\mu - ri_\mu \cdot \grave{a}_\mu a_\mu \cdot lá_\mu$ [0-0201]	*!	*!	*	✓	*
b. $\underline{ri}_\mu - ri_\mu \cdot \grave{a}_\mu a_\mu \cdot lá_\mu$ [2-0201]			*!	✓	*
c. $\overset{\text{☞}}{\underline{ri}_\mu \grave{i}_\mu} - ri_\mu \cdot \grave{a}_\mu a_\mu \cdot lá_\mu$ [02-0201]				*	✓
d. $\underline{ri}_\mu \grave{i}_\mu - ri_\mu \cdot \grave{a}_\mu a_\mu \cdot lá_\mu$ [20-0201]		*!		*	✓

(40) Heavy-syllable-initial even parity stems \rightarrow no $*REPEAT$ effect: (36a) $du_\mu \acute{u}_\mu p \rightarrow \underline{du}_\mu - du_\mu \acute{u}_\mu p$

/RED, $du_\mu u_\mu p$ /	STRESS-TO-RED	$*LAPSE_\mu$	$*REPEAT$ (light)	RED = μ	RED = 2μ
a. $\underline{du}_\mu - du_\mu \acute{u}_\mu p$ [0-01]	*!	*!		✓	*
b. $\overset{\text{☞}}{\underline{du}_\mu} - du_\mu \acute{u}_\mu p$ [2-01]				✓	*
c. $\underline{du}_\mu \grave{u}_\mu - du_\mu \acute{u}_\mu p$ [02-01]				*!	✓
d. $\underline{du}_\mu \acute{u}_\mu - du_\mu \acute{u}_\mu p$ [20-01]		*!		*	✓

- This gives us the following ranking:

(41) Ponapean stress and reduplication ranking



- The crucial point vis-à-vis $S \gg R$ is the alternation between (i) bimoraic reduplicants in odd parity stems, and (ii) monomoraic reduplicants in even parity stems not extended by $*REPEAT(light)$.
- The extension in the monomoraic stems is driven by a need to satisfy $*CLASH_\mu$.
- This comes at the expense of creating a longer reduplicant, which is dispreferred by the constraint preferring monomoraic reduplicants.

- **This is precisely the sort of relationship predicted by $S \gg R$, where constraints which are unviolated in the general language necessarily override preferences for reduplicant shape.**

- Ponapean shows the same single-unit reduplicant gap that the Australian languages display, but with a number a stress parameters switched:

	Stress parameters	Australian	Ponapean
(42)	Unit of metrical computation	<i>syllable</i>	<i>mora</i>
	Orientation of fixed stress	<i>left</i>	<i>right</i>
	Position of fixed stress relative to edge	<i>edgemoſt</i>	<i>edgemoſt</i>
	Permission of lapses	<i>yes</i>	<i>no</i>

- This demonstrates that the requirement that reduplicant shape not countermand stress requirements is not isolated to the limited set of Australian cyclic QI L→R languages.

4 Ngan’gityemerri

- Among the languages examined in the survey of Australian languages, one language has QI L→R characteristics but also permits leftward monosyllabic reduplication: Ngan’gityemerri (Reid 2011).
- What sets Ngan’gityemerri apart from the other QI L→R Australian languages is its **permission of stress clashes** in certain morphological contexts.
 - *CLASH is therefore not a member of the STRESSREQ set in this language.
 - $S \gg R$ thus allows for the possibility that a REDSIZE constraint could outrank *CLASH in this language, which is indeed the case.

⇒ Therefore, monosyllabic reduplication in this language is $S \gg R$ -compliant.

4.1 Ngan’gityemerri Stress

- The stress pattern in this language is fairly complex, and differs significantly by morphological domain.

4.1.1 Monomorphemic nominals

- In monomorphemic nominals, Ngan’gityemerri shows classic QI L→R behavior:

- (43) Stress in monomorphemic nominals (Reid 2011:90, ex 2-95)⁶
- 2σ : fépi ‘rock, hill’, mípur ‘man’, dágum ‘dew’, gánggi ‘high, upstream’
 - 3σ : détyengi ‘today’, mínati ‘big’
 - 4σ : ápuđerri ‘pubescent girl’, ánemùni ‘sweetheart’

- These can be explained with the same constraint ranking used for Diyari:

- (44) Monomorphemic nominals stress ranking: STRESSL, *CLASH, NONFINALITY \gg *LAPSE.

⁶Transcribed < ny, ty, y > = IPA [ɲ, tɨ, j]; < y > never indicates a vowel.

4.1.2 Complex verbs

- Stress operates very differently in the verbal domain (Reid 2011:97–99).
- Serial (“complex”) verbs are composed of an auxiliary stem (light verb + agreement affixes) plus a verbal stem (lexical verb + valence/aspect affixes). This is schematized in (45).
 - The symbol “=” indicates the stem-stem boundary; “-” indicates a morpheme boundary.

(45) Ngan’gityemerri complex verb: [[$\acute{\sigma}$ σ ...]_{AUX STEM} = [$\acute{\sigma}$ σ ...]_{VERBAL STEM}]_{“COMPLEX” VERB}

- In the normal case, such a word has two and only two stresses:
 - One primary stress on the leftmost syllable of the auxiliary stem (leftmost syllable of the word)
 - One secondary stress on the leftmost syllable of the verbal stem

(46) Basic stress in the complex verb (examples from Reid 2011:97–99)⁷

- yéniny=pàp ‘He climbed up’
- yú=tyèrr-dum ‘Shut the door!’
- yénim=mì-wap-nyine ‘She’s married now’
- ngárim=fì-tyat ‘I built it’
- wárrangiti=fì-pal-endi-pe ‘They’ll come back for me later’

- This basic pattern can be captured with the constraints in (47), ranked as in (48).

(47) Stress constraints for the Ngan’gityemerri complex verb

- STRESSL-STEM:** Assign one violation * for each stem (i.e. auxiliary stem and verbal stem) whose leftmost syllable does not bear a stress.
- ONESTRESS(complex verb):** The complex verb (i.e. auxiliary stem and verbal stem) should have exactly one stress. Assign one violation * for each additional stress.⁸
- *LAPSE:** Assign one violation * for each sequence of two unstressed syllables.

(48) Ranking: STRESSL-STEM \gg ONESTRESS(complex verb) \gg *LAPSE

- This is demonstrated for *wárrangiti=fì-pal-endi-pe* in (49).

(49) Basic stress pattern for complex verbs: *wárrangiti=fì-pal-endi-pe* (46e)

/wárrangiti=fì-pal-endi-pe/	STRESSL-STEM	ONESTRESS(complex verb)	*LAPSE
a. wárrangiti=fì-pal-endi-pe	*!		*****
b. wárrangiti=fì-pal-endi-pe		*	*****
c. wárrangiti=fì-pal-èndi-pe		**!*	*

- STRESSL-STEM also interacts with the other basic stress constraints in (44).
 - Each stem bears stress on its leftmost syllable, even if this results in a stressed final syllable (46a).

(50) STRESSL-STEM \gg NONFINALITY: *yéniny=pàp* (46a)

/yeniny=pap/	STRESSL-STEM	NONFINALITY
a. yéniny=pàp		*
b. yéniny=pap	*!	

⁷Following Reid (2011:§3), I omit morphological boundaries within the auxiliary stem.

⁸Similar to CULMINATIVITY (Prince 1983, Hyman 2006).

- Each stem bears stress on its leftmost syllable, even if this results in a clash (46b).

(51) STRESSL-STEM \gg *CLASH: *yú=tyèrr-dum* (46b)

	/yu=tyerr-dum/	STRESSL-STEM	*CLASH
a. ☞	yú=tyèrr-dum		*
b.	yú=tyerr-dum	*!	
c.	yu=tyérr-dum	*!	

- ◇ Both of these rankings are also evidenced in nominal compounding (Reid 2011:91–92):

- For example, *fírr=ngàri* ‘toenail’, *míl-míl=mà* ‘cosmetic stick (for scraping skin etc.)’

⇒ Notice that this means both NONFINALITY and (crucially) *CLASH are not unviolated constraints in the language, i.e. **not STRESSREQs**.

- The verbal stem of the complex verb can include reduplication.
 - This reduplication is usually *monosyllabic*, perhaps contrary to expectation.
 - Coupled with the stress facts just enumerated, the stress facts in §4.1.3 provide the last piece of the explanation of the reduplicant shape pattern, which I’ll lay out in the following section.

4.1.3 Complex verbs with reduplication

- One exception to generalization that complex verbs bear stresses only on their stem-initial syllables:
 - If the verbal-stem-initial syllable is part of a reduplicant or a reduplicative base, the stem-initial syllable and the syllable it stands in Base-Reduplicant correspondence with **both bear a stress**, as in (52):

(52) Additional stresses in reduplication (Reid 2011:97–99; Red is underlined, Base+Red in { })

i. *Leftward partial reduplication*

a.	ngíni={ <u>kù</u> -kùluk}-tye	‘I was coughing’
b.	yémingiti={fì-fityi}-pagu-pe	‘Roll me some (smokes)!’

ii. *Rightward total reduplication*

c.	ngúdum={fírrkity-fírrkity}	‘I swung (the goanna) round ‘n round’
d.	wíringgu={dà-dà}	‘They (dl.) are singing’
e.	ngúdum={bàt-bít}	‘I whacked it on the ground’
f.	wáddi={wà-wù}-tye	‘They used to collect (rations)’
g.	wíribem={mírr-mírr}-nyine	‘(The car) is running now’

- This behavior can be explained using Base-Reduplicant faithfulness to stress:

(53) **BR-IDENT[stress]**: Assign one violation * for each pair of vowels standing in BR-correspondence that do not have identical values for stress. (See Stanton & Zukoff 2016a,b for further discussion.)

- This is Base-Reduplicant version of Base-Derivative stress faithfulness constraint proposed for Diyari (15e).

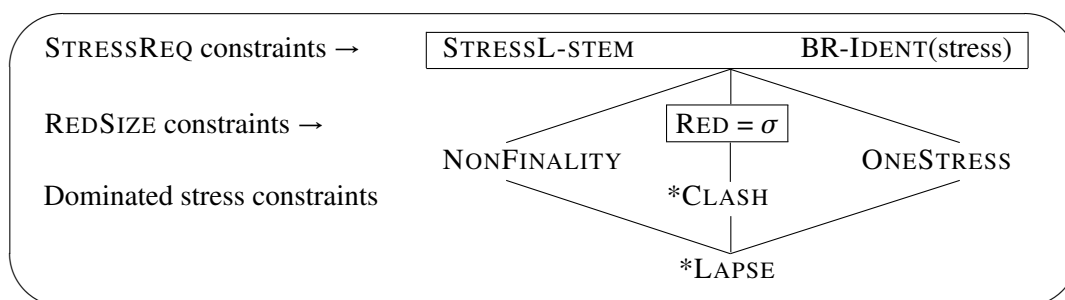
- If STRESSL-STEM requires a stress on either the base or the reduplicant, BR-IDENT[stress] requires a stress on the other correspondent: BR-IDENT[stress] \gg ONESTRESS(complex verb).

(54) Additional stress with stem-initial BR: *yémingiti={fì-fityi}-pagu-pe* (52b)

	/yemingiti={RED-fityi}-pagu-pe/	STRESSL-STEM	BR-IDENT[stress]	ONESTRESS
a. ☞	yémingiti={ <u>fì</u> -fityi}-pagu-pe			**
b.	yémingiti={fì-fityi}-pagu-pe		*!	*
c.	yémingiti={fì-fityi}-pagu-pe	*!		

- But, the stress rankings that we observe from the complex verb, when viewed from the perspective of **S** \gg **R**, explains why monosyllabic reduplicants are permitted in this language.
 - There are only two conditions that are fully surface-true, and thus could fall into the category of “STRESSREQ”: STRESSL-STEM and BR-IDENT(stress).
 - Even though *CLASH is never violated in simplex nominals, the verbal system shows that it is violable in service of STRESSL-STEM (and also BR-IDENT(stress)).
 - Since *CLASH can be violated, *it is not a stress requirement in this language*.
- According to **S** \gg **R**, REDSIZE constraints are only required to be dominated by STRESSREQ constraints; otherwise violated stress constraints **can be subordinated to REDSIZE constraints**.
 - Since *CLASH is not a STRESSREQ, the REDSIZE constraint RED = σ is permitted to dominate it.
 - Therefore, the ranking in (59), demonstrated in tableau (60), is consistent with the **S** \gg **R** hypothesis.

(59) Ngan’gityemerri stress and reduplication ranking



- ◊ This total ranking raises interesting questions about the relationship between REDSIZE constraints and dominated stress constraints.

(60) Deriving monosyllabic reduplicants: *yémingiti={fì-fityi}-pagu-pe* (52b)

/yemingiti={ <u>RED</u> -fityi}-pagu-pe/	STRESSL STEM	BR-IDENT [stress]	RED = σ	*CLASH	ONE STRESS
a. $\text{yémingiti}=\{\underline{\text{f}}\dot{\text{i}}\text{-fityi}\}\text{-pagu-pe}$			✓	*	**
b. $\text{yémingiti}=\{\text{f}\dot{\text{i}}\text{y}\dot{\text{i}}\text{-fityi}\}\text{-pagu-pe}$			*!		**
c. $\text{yémingiti}=\{\underline{\text{f}}\dot{\text{i}}\text{-fityi}\}\text{-pagu-pe}$		*!	✓		*
d. $\text{yémingiti}=\{\underline{\text{f}}\text{-fityi}\}\text{-pagu-pe}$	*!		✓		

- The requirements to stress the left edge of the stem and for BR stress identity can be met by either a one syllable or two syllable reduplicant ((60a) & (60b)).
 - The ranking RED = σ \gg *CLASH thus can select the monosyllabic reduplicant (60a).
- ⇒ Ngan’gityemerri thus actually perfectly conforms to the **S** \gg **R** hypothesis, since the REDSIZE constraint can be dominated by the stress constraints which are unviolated and still exert its force.

NB: As in Ponapean, the preferred reduplicant shape (monosyllabic) is minimal, so it can be implemented either with a templatic constraint (RED = σ) or a *size restrictor*.

5 Conclusion and Discussion

5.1 $S \gg R$

- We have now seen several different types of languages where the application of unviolated stress considerations restricts the range of possible reduplication patterns:
 - §2: Cyclic QI L→R stress prevents monosyllabic reduplication in Australian languages.
 - §3: Strictly alternating stress induces prosodic variability in Ponapean reduplication.
 - §4: The permission of clashes licenses monosyllabic reduplication in Ngan’gityemerri.
- These effects are consistent with a meta-ranking condition holding of the relationship between stress requirements and reduplicant size preferences (repeated from (13)):

(61) Stress-Reduplication Meta-Ranking: STRESSREQ \gg REDSIZE ($S \gg R$)

5.2 Template Satisfaction

- $S \gg R$ asserts that templatic constraints may never be undominated (*contra* McCarthy & Prince 1993b).
 - The possibility of undominated templatic constraints over-generates:
 - It predicts that monosyllabic reduplicants should be possible for cyclic QI L→R stress systems.
 - The survey of Australian languages (and informal checking of other systems) indicates that these patterns are unattested.
 - This gap can be accounted for by prohibiting undominated templatic constraints (at least in cases where they would conflict with the stress requirements), as with the $S \gg R$ meta-ranking.
- Invariant template satisfaction occurs only when the stress requirements happen to be compatible with the preferred templatic constraint.
 - This is the case for Diyari and other similar Australian languages, in which the fixed disyllabic (or foot-sized) reduplicant turns out to be the only shape which fully satisfies the STRESSREQs.
- Invariant template satisfaction could also be achieved in non-stress languages, where the $S \gg R$ requirement will be vacuous, as the STRESSREQ set is the empty set (see below).
 - ◊ It is an interesting question whether any similar relationships exist between tone and reduplicant shape.
- Similarly, there will be no effect of the meta-ranking in languages where the STRESSREQ constraints happen not to interact with reduplication.
 - For example, languages that place a single stress at the opposite edge of the word from the reduplicant.

5.3 Meta-categories and Learning

- The $S \gg R$ proposal introduces two constraint *meta-categories*: STRESSREQ and REDSIZE.
 - The nature of the system gives STRESSREQ constraints a sort of priority which is unusual in standard conceptions of OT.
 - The determination of the membership of the STRESSREQ set must be made prior to constructing the ranking for reduplication.¹¹

¹¹Ngan’gityemerri shows that this calculation takes (at least some) morphological information into account: it is evidence of stressing stem boundaries in the complex verb (and also nominal compounding) that reveals that *CLASH is not a STRESSREQ in the language.

- We might wonder if this could be an effect of the learning/acquisition process. Speculatively, perhaps:
 - (i) (The morphophonology of) partial reduplication patterns are acquired relatively late in the time course of acquisition, after the details of the stress system have already been fixed.
 - Learners don't attend to reduplicant shape early?
 - Learners don't receive right sort of evidence early?
 - Constraints which ultimately constitute STRESSREQs are evidenced in virtually all forms of the language from the earliest stages of the learning process.
 - This causes them to accrue a very high constraint weight, which REDSIZE can never overcome.
 ⇒ This approach would resemble Stanton's (2014) "Visibility Hypothesis":
 - Constraints with a lot of positive evidence for their activity ("highly visible" constraints) necessarily dominate constraints with little/no positive evidence for their activity ("invisible" constraints).
 - Stanton (2014:6–9) uses visibility to filter out unattested rankings among stress constraints in cyclic QI L→R Australian languages.
 - (ii) The constraint types differ significantly in their plasticity and/or initial bias:
 - STRESSREQs are markedness constraints, and thus are expected to have high plasticity and/or high initial weights.
 - If REDSIZE constraints have low plasticity and/or low initial weight, there may not be enough evidence to overtake STRESSREQs.
 - If learners wait to attend to REDSIZE constraints, a general decrease in plasticity will make it difficult for REDSIZE constraints to overtake STRESSREQs.
- Evidence from the acquisition of reduplication in Turkish may suggest that this could be on the right track (Sofu 2005), but much further investigation is required.
- ◇ **Possible prediction:** If $S \gg R$ is related to the amount of evidence a learner receives, it is likely that any *bona fide* counter-examples to $S \gg R$ will be languages where reduplicated forms have unusually high frequency in (early) learning input.

5.4 Do we need templates at all?

- The nature of the REDSIZE constraints also bears further discussion. The templatic constraints have done very little work in generating forms.
- In each case examined here, the optimal form in every circumstance has been the **minimal phonotactically-licit reduplicant** that satisfies all high-ranked markedness constraints.
 - In Ponapean, the reduplicant is only extended beyond its monomoraic minimum when *CLASH or *REPEAT(light) are in danger of violation.
 - Diyari's disyllabic reduplicant is the shortest reduplicant that simultaneously satisfies all STRESSREQs.
 - Ngan'gityemmerri's light monosyllabic reduplicant is the shortest possible (phonotactically-licit) reduplicant; no higher-ranked constraints force extension.

- These facts point to a solution (at least for these sorts of languages) without templatic constraints (see Gafos 1998, Hendricks 1999), but rather with a **size restrictor** constraint (Spaelti 1997; cf. Riggle 2006).
 - In one way or another, size restrictors penalize additional material in the reduplicant.

(62) Some proposed size restrictor constraints

- ALL-FEET/ σ -L/R (McCarthy & Prince 1994b, Spaelti 1997, *a.o.*)
- *STRUC(TURE)-SEG/ σ (Riggle 2006; cf. Zoll 1994)
- ALIGN-ROOT-L/R (Hendricks 1999, Zukoff 2017, *a.o.*; cf. Riggle 2006)
- DEP(Seg)-BD/OO (Gouskova 2004)
- INTEGRITY-IO (Spaelti 1997; cf. Riggle 2006, Saba Kirchner 2010, 2013)

- When the size restrictor dominates MAX-BR (which requires maximal copying from the base; McCarthy & Prince 1995), the reduplicant will be as small as possible, subject to the needs of higher-ranked constraints. (Total reduplication would be achieved with the reverse ranking.)

⇒ When reduplicant size is determined by the interaction of the size restrictor with **prosodic** constraints, we derive McCarthy & Prince’s (1986 [1996]) generalization that reduplicative “templates” must take the shape of prosodic categories, without any mention of templates.

- **Caveat:** As of yet, this approach leaves unexplained non-minimal partial copying patterns that are not obviously induced by prosodic constraints.
 - Well-known case: the consistently disyllabic reduplication found in many Bantu languages (see Hyman 2009 for overview). In Kinande, e.g., various copying strategies converge on a disyllabic reduplicant:

(63) Verbal reduplication in Kinande (Mutaka & Hyman 1990)

· *Root in italics, reduplicant underlined, pre-stem/stem boundary marked by ‘=’*

- e-ri=*hum*-a ‘to beat’ → e-ri=hum.a-*hu.m*-a (M&H 85)
- e-rí=*twal*-a ‘to bring’ → e-rí=twal.la-*twa.l*-a (M&H 86)
- e-rí=*byl*-y-a ‘to ask’ → e-rí=byl.ya-*by.l*-y-a (M&H 86)
- e-ri=*sw*-a ‘to grind’ → e-ri=swa.swa-*sw*-a (M&H 87)
- e-ry=*oh*-a ‘to pick’ → e-ry=o.ho.h-*o.h*-a (M&H 88)
- e-ri=*hum-ir*-a ‘to beat for’ → e-ri=hu.ma-*hu.m-i.r*-a (M&H 91)
- e-ri=*sw-er*-a ‘to grind for’ → e-ri=swe.ra-*sw-e.r*-a (M&H 91)
- e-rí=*bugul*-a ‘to find’ → **no reduplication** (M&H 106)

- Additional morphological complications all robustly adhere to an apparent disyllabic template.
- Kinande and the other Bantu languages are tone languages, and do not show any obvious signs of stress.
 - Therefore, a stress-based account of the disyllabism is a non-starter.
 - A similar tone-based approach could be imagined (say, the reduplicant is in a prosodic or morphological position that must bear two tones), but there is no obvious evidence for any such behavior in Kinande.
- Mutaka & Hyman (1990:111–114) speculate that the disyllabic shape of the reduplicant might be tied to disyllabic minimal word effects (morpheme (non-)realization in the imperative, clitic allomorphy).
 - If the verb “word” can be divided into the right sorts of constituents, this line of attack could be amenable to a GTT-type approach: perhaps RED = STEM + (prosodic) constraints on stems.

5.5 Takeaway

- The distribution of reduplicant shape suggests that the grammar is equipped with *constraint meta-categories*, which can have ranking restrictions on them.
 - Significant implications for the organization of the grammar, and connections with learning.
- The **S** \gg **R** hypothesis coupled with the a-templatic size restrictor approach (where the size restrictor(s) play the role of REDSIZE constraints) provides a restrictive account of the cross-linguistic typology of reduplicant shape in partial reduplication.

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