

# Post-syntactic altruism\*

Emily Clem  
University of California, San Diego  
eclem@ucsd.edu

Nicholas Rolle  
Princeton University  
nrolle@princeton.edu  
NELS 50, 10/26/19

Virginia Dawson  
University of California, Berkeley  
virginia.dawson@berkeley.edu

## 1 Introduction

- A long tradition of work in syntax has sought to understand the motivations for narrow syntactic movement
  - Movement is *greedy* – an element moves to satisfy its own requirements (Bošković, 1995, 2007; Chomsky, 1995, a.o.)
  - Movement can be *altruistic* – an element can move to satisfy requirements of a distinct element (Lasnik, 1995, 2003; Zyman, 2017, a.o.)
- In addition to movement that occurs in the narrow syntax, various instances of displacement and reordering occur in the post-syntax (Marantz, 1988; Embick and Noyer, 2001; Matushansky, 2006; Arregi and Nevins, 2012, 2018, a.o.)
- We argue that, just as narrow syntactic movement can be greedy or altruistic, so can post-syntactic displacement
- We present evidence for altruism in the post-syntax from a process of morpheme inversion and doubling in Tiwa (Tibeto-Burman; India)
  - In Tiwa verbal morphology, focus marking can sometimes intervene between tense and agreement in the base-generated order
  - When T-FOC-AGR base order occurs, T doubles or inverts with FOC in the post-syntax to result in surface adjacency between T and AGR

- (1) a. Base-generated order  
V-ASP-**T**-FOC-AGR
- b. Surface order with inversion  
V-ASP-FOC-**T**-AGR
- c. Surface order with doubling  
V-ASP-**T**-FOC-**T**-AGR

---

\*We would like to thank the members of the Tiwa community, particularly Bibiana Maslai and Juliana Maslai, for their collaboration. Primary data were collected by Virginia Dawson. We are grateful for the feedback from Laura Kalin, Sharon Inkelas, the attendees of UC Berkeley's Syntax & Semantic Circle, and the anonymous NELS reviewers.

- We argue that inversion and doubling of T is altruistic: it is motivated by requirements of AGR
- The Tiwa data thus suggest that post-syntactic displacement can be altruistic just as narrow syntactic movement can be
- **Roadmap:**
  - §1: Introduction
  - §2: Tiwa verbal morphology and allomorphy
  - §3: Inversion and doubling in Tiwa
  - §4: The analysis: Post-syntactic altruism
  - §5: Comparison to post-syntactic greed
  - §6: Morphotactics and altruism beyond Tiwa
  - §7: Conclusion

## 2 Tiwa verbal morphology and allomorphy

- The finite verb in Tiwa can host several affixes that occur in a fixed order
  - The slot closest to the root can be occupied by either aspect or negation (but not both)
  - Tense follows aspect
  - Subject agreement<sup>1</sup> follows tense

(2) [ root - ASP/NEG - TENSE - AGR ]

-do	IPFV	-∅	NPST	-ng/-âng	1SG
-ga	PFV	-m	PST		
-o/-w	NEUT				
-ya	NEG				

---

<sup>1</sup>Here we do not take a stance on whether this marker is the result of true agreement or clitic doubling and use the term "agreement" for convenience.

- Subject agreement is only overt for first person singular subjects and is optional

(3) **khôna-ya-m(-âng)**  
hear-NEG-PST-1SG  
'I did not hear.'

- Agreement can double a full pronoun and is derived transparently from the 1SG pronoun

(4) **âng hât-jíng lí-do-m-âng**  
I market-to go-IPFV-PST-1SG  
'I had gone to market.'

- 1SG agreement has two allomorphs: *-ng* [-ɲ] or *-âng*, the latter with a full vowel and falling tone

(5) a. **lí-ya-Ø-*ng***  
go-NEG-NPST-1SG  
'I will not go.'  
b. **lí-ya-m-âng**  
go-NEG-PST-1SG  
'I did not go.'

- The *-âng* allomorph of 1SG only surfaces after the tense marker *-m* PST
- We therefore analyze 1SG allomorphy as being morphosyntactically conditioned

(6) a. [1SG] ↔ *-âng* / [PST]\_  
b. *-ng* / elsewhere

### 3 Inversion and doubling in Tiwa

- Further evidence for the close relationship between subject agreement and tense comes from patterns of tense inversion and doubling
- Tiwa has several focus clitics, which are typically merged outside of agreement

(7) 'I did not go.'

- a. *-bo*  
/root-NEG-PST-AGR-FOC/  
/lí-ya-m-âng-**bo**/ [líyamângbo]
- b. *-se*  
/root-NEG-PST-AGR-FOC/  
/lí-ya-m-âng-**se**/ [líyamângse]
- c. *-lo*  
/root-NEG-PST-AGR-FOC/  
/lí-ya-m-âng-**lo**/ [líyamânglo]

- Focus can sometimes instead adjoin to a smaller structure and be merged *inside* agreement
- When focus merges inside agreement it splits tense and agreement, triggering two operations: inversion or doubling of tense
  - *-m* PST can invert with focus to appear adjacent to *-âng* 1SG on the surface
  - *-m* PST can double to occur on both sides of focus, also yielding surface adjacency between *-m* PST and *-âng* 1SG
  - Typologically, the doubled X-Y-X pattern resembles 'alternating multiple exponence' (Harris, 2017)

(8) 'I would have gone.'

- a. High FOC, No Displacement  
/root-NEUT-PST-AGR-FOC/  
/lí-w-**m**-âng-bo/ [líwmângbo]
- b. Low FOC, Inversion  
/root-NEUT-PST-FOC-AGR/  
/lí-w-**m**-bo-âng/ → lí-w-bo-**m**-âng [líwbomâng]
- c. Low FOC, Doubling  
/root-NEUT-PST-FOC-AGR/  
/lí-w-**m**-bo-âng/ → lí-w-**m**-bo-**m**-âng [límbomâng]

- Inversion and doubling ensure that in all surface forms there is adjacency between *-m* PST and *-âng* 1SG
- Crucially, without overt 1SG agreement, *-m* PST can never invert with focus or double

- (9) ‘(S)he would have gone.’
- a. /root-NEUT-PST-FOC/  
/lí-w-**m**-bo/ [lí**m**bo]
- b. /root-NEUT-PST-FOC/  
/lí-w-**m**-bo/ → \*lí-w-bo-**m** \*[líwb**om**]
- c. /root-NEUT-PST-FOC/  
/lí-w-**m**-bo/ → \*lí-w-**m**-bo-**m** \*[lí**m**b**om**]
- The ungrammaticality of the order FOC-PST in the absence of *-âng* 1SG indicates that focus does not simply have a lower possible adjunction site below tense (i.e. \*/root-NEUT-FOC-PST/)
  - The unavailability of inversion and doubling without *-âng* 1SG suggests that these instances of displacement are post-syntactic
    - The post-syntactic insertion of the allomorph *-âng* 1SG appears to feed displacement, with inversion and doubling of *-m* PST strictly dependent upon the presence of *-âng* 1SG
    - If T underwent narrow syntactic movement as a precondition for the insertion of the allomorph *-âng* 1SG, we would expect syntactic movement to be possible without subsequent insertion of *-âng* 1SG
  - ▶ We argue that *-m* PST undergoes inversion and doubling altruistically in the post-syntax, to meet requirements of *-âng* 1SG

## 4 The analysis: Post-syntactic altruism

- We assume that morphemes can be specified with two types of conditions that reference their local context (following ongoing work in Kalin and Rolle, in prep.)
  - **Conditions on insertion:** The pre-conditions that must exist in an environment in order for insertion of a Vocabulary Item to be possible (used to license contextual allomorphy)
  - **Conditions on position:** The conditions that a Vocabulary Item imposes on its linear environment (used to govern relative position, e.g. 2nd position clitics, infixes, templatic effects, etc.)
- ▶ We argue that a condition on insertion licenses the insertion of the allomorph *-âng* 1SG, while a condition on position of *-âng* triggers the altruistic inversion or doubling of *-m* PST

- We couch our analysis of post-syntactic altruistic displacement within a hybrid framework OT-DM (Rolle, 2019), combining the core architectural assumptions of Distributed Morphology (DM; Halle and Marantz, 1993), but with constraint-based input-output computation allowing for parallel application of operations (à la Optimality Theory; Prince and Smolensky, 1993)<sup>2</sup>
  - Non-lexicalist (“syntax all the way down”)
  - Realizational (“late insertion” of phonological primitives via Vocabulary Items)
  - Constraint-based and output-oriented

### 4.1 Conditions on insertion

- Each Vocabulary Item may contain a condition on insertion, which specifies the context within which it can be inserted
  - These are the contextual realization rules of DM
- As stated, for 1SG we assume that its allomorphs differ in their conditions on insertion

- (10) a. [1SG] ↔ -âng / [PST]\_  
b. -ng / elsewhere

- When FOC is merged between PST and 1SG, general linearization principles (e.g. the Mirror Principle; Baker, 1985) will yield the order in (11a)
- In this context, *-âng* is still inserted rather than the default *-ng*, yielding the post-exponence structure in (11b)

- (11) a. /...-PST-FOC-1SG/  
b. /...-**m**-bo-**âng**/ \* /...-**m**-bo-**ng**/

<sup>2</sup>The OT-DM framework is recently supported in Rolle 2019, with many predecessors (Noyer, 1992; Trommer, 2001a,b, 2002; Wolf, 2008; Dawson, 2017; Foley, 2018, a.o.). This framework may come in a strong version in which all post-syntactic operations take place in parallel at spell-out, or a weaker version in which one set of post-syntactic operations takes place at spell-out, while another takes place in a later input-output computation. This latter computation can be interpreted either as a separate pre-phonology morphological module, or interleaved within the phonological module itself. Within this analytic range, post-syntactic altruism remains regardless, our main point here.

- These data demonstrate that the locality conditions on insertion need not be evaluated in terms of strict linear adjacency
  - This follows a growing body of work demonstrating similar patterns, whose empirical content require us to minimally loosen locality restrictions in allomorphy (Merchant, 2015; Moskal, 2015a,b; Moskal and Smith, 2016; Kastner and Moskal, 2018; Božič, 2019; Smith et al., 2019, a.o.)
- Crucially, conditions on insertion do not alter the structure within which they are placed
- ▶ “No self-licensing principle”:<sup>3</sup>
  - At exponence, individual Vocabulary Items cannot facilitate their own licensing by altering the context (e.g. by reordering elements, copying elements, adding or deleting elements, etc.)

## 4.2 Conditions on position

- We propose that the Vocabulary Item *-âng* 1SG has an additional requirement that it be surface-adjacent to its allomorphy trigger, *-m* PST
  - For the learner, all tokens of *-âng* appear adjacent to *-m*, but not all tokens of *-m* are adjacent to *-âng* (e.g. when there is no overt agreement)
- We call such requirements **conditions on position**
  - Conditions on position specify the morphological or phonological structure that must be linearized to the right or left of a Vocabulary Item
  - These conditions are part of a long lineage of work on post-syntactic morph order manipulation, particularly in DM via Local Dislocation (Embick and Noyer, 2001; Embick, 2007; Embick and Marantz, 2008, a.o.) and other metathesis operations (Guseva and Weisser, 2018; Arregi and Nevins, 2018)

<sup>3</sup>We take this principle to be an implicit assumption of analyses of contextual allomorphy in the literature. Further, Embick and Noyer (2001) are explicit that Local Dislocation – a similar formalism related to our conditions on position that *can* change the local environment of a morph – “occurs after Vocabulary Insertion” (562), and thus, after allomorphy selection.

- Conditions on position can be understood as a sub-type of subcategorization frame (Lieber, 1980; Inkelas, 1990; Booij and Lieber, 1993; Zec, 2005; Paster, 2006; Yu, 2007; Bennett et al., 2018; Brinkerhoff, 2019; Rolle and Hyman, 2019; Tyler, 2019, a.o.)
  - Subcategorization approaches are ideal for accounting for idiosyncratic quirks of lexical items, which cannot be reduced to a more general system
- This condition on position for *-âng* 1SG can be conceptualized as an abstract pre-linearized string in its lexical entry, along which correspondence relations can be established with output candidates
  - The underlying representation of the allomorph is in white
  - Morphological or phonological structure which is subcategorized for is in gray

### (12) *-âng* Vocabulary Item

SC	UR
<i>-m</i>	<i>-âng</i>
[T:PST]	[ $\phi$ :1SG]

- If the condition on position is not (incidentally) satisfied by the merge position corresponding to the Vocabulary Item, post-exponence repairs can occur to satisfy this condition
  - In Tiwa, inversion and doubling are repairs that serve to satisfy the condition on position for *-âng* 1SG<sup>4</sup>
- The second allomorph of Tiwa 1SG, *-ng*, lacks a condition on position entirely, represented by a lack of a subcategorized structure

### (13) *-ng* Vocabulary Item

UR
<i>-ng</i>
[ $\phi$ :1SG]

- Consequently, *-ng* 1SG never triggers post-syntactic displacement

<sup>4</sup>A potential alternative to attributing inversion and doubling to a property of *-âng* 1SG would be to adopt Ryan’s (2010) analysis of morphotactics involving bigram constraints, in which the locus of morphotactic idiosyncrasy is in the constraint set and not attributable to an individual Vocabulary Item itself. Under this model, notions of post-syntactic “altruism” and “greed” do not appear to be appropriate.

### 4.3 Altruistic inversion/doubling via constraint interaction

- As stated, if *-âng* 1SG is not adjacent to *-m* PST, inversion and doubling are post-exponence repairs that can satisfy its condition on position
- These instances of post-syntactic displacement are *altruistic* in the following way
  - The trigger of inversion and doubling is *-âng* 1SG (i.e. it has the condition on position requiring adjacency with *-m* PST)
  - The target of inversion and doubling is not *-âng* 1SG itself, but rather *-m* PST
  - Therefore, *-m* dislocates *altruistically* to satisfy *-âng*
- One reason the altruistic pattern in Tiwa could have developed could be due to a locality bias in allomorphy (Božič, 2019)
  - Allomorphy of 1SG is conditioned by tense, even in the absence of underlying adjacency
  - The condition on position for *-âng* 1SG serves to bring about surface adjacency between the trigger and target of allomorphy
- Post-syntactic altruistic movement can be captured through simple constraint interaction in an Optimality Theoretic approach (Prince and Smolensky, 1993)
  - We assume that inversion and doubling are freely available operations, whose outputs are selected only if they are output optimizing
- The attested patterns of inversion and doubling can be modeled using four constraints

- (14) a. POSITION-OV: For all morphs in an output candidate (O), it is part of a string which corresponds to the string stored in its Vocabulary Item (V) (i.e. the string consisting of the SC and the UR)<sup>5</sup>
- b. ANCHOR-R(MORPH,WORD): A morph at the right edge of a word in the input (I) corresponds to a morph at the right edge in the output (O) (adapted from Yip, 2002: 161)

<sup>5</sup>Recently, Rolle and Lionnet (2019) introduced “Phantom Structure” to capture subcategorization-like requirements in grammatical tone alignment. Phantom structure would correspond to the grayed-out SC portion of the lexical entry. We leave this possibility aside here, but note its connection.

- c. LINEARITY-IO(MORPH): The precedence structure of the morphs in the input (I) is preserved in the output (O) (adapted from Kager, 1999: 63, a.o.)
- d. INTEGRITY-IO(MORPH): No morph in the input (I) has multiple correspondents in the output (O) (adapted from McCarthy and Prince, 1995)

- This set of constraints allows both inversion and doubling to emerge as possible outputs

(15)

Input: /lí-w-m-bo-âng/		POS	ANCH	LIN	INT
a. lí-w-m-bo-âng	fully faithful	*!			
b. lí-w-bo-m-âng	<i>-m</i> inversion			*	
c. lí-w-m-bo-m-âng	<i>-m</i> doubling				*
d. lí-w-m-âng-bo-âng	<i>-âng</i> doubling	*!			*
e. lí-w-m-âng-bo	<i>-âng</i> inversion		*!	*	

- POS is highly ranked, meaning that the condition on position for *-âng* 1SG must be satisfied in the output
  - Because POS is a universal constraint (not an existential constraint), all instances of *-âng* must be part of the corresponding string -m-âng in its Vocabulary Item
- *-âng* 1SG itself cannot undergo displacement to satisfy POS
  - If *-âng* 1SG doubled, one instance of *-âng* would still not be adjacent to *-m* PST, violating POS
  - If *-âng* 1SG inverted with FOC, it would violate ANCH since *-âng* would be at the right edge in the input but not in the output
- Instead, *-m* PST undergoes displacement altruistically, with both inversion and doubling as equally optimal possibilities
  - Inversion of *-m* PST and FOC only violates LIN governing linear precedence relations
  - Doubling of *-m* only violates INT governing multiple correspondents
- The Tiwa facts illustrate a “resolution of a basic tension between two competing pressures” (Hyman, 2003), one of which is ‘morphotactic’, the other being some general principle which holds across the language
  - **Morphotactic:** A pressure to satisfy the condition on position of *-âng* 1SG

- **General:** A pressure for the surface order to match the default linearization of the syntactic structure
- This is comparable to Chichewa (Hyman, 2003), where the tension is specifically understood as between the Mirror Principle (a syntactic mapping principle; Baker, 1985) and obeying the C-A-R-P template (a morphotactic constraint)<sup>6</sup>
- In both languages, both morpheme inversion and morpheme doubling emerge as possible resolution strategies

## 5 Comparison to post-syntactic greed

- While the Tiwa pattern of inversion and doubling is altruistic, similar surface patterns can arise due to *greedy* post-syntactic displacement
- In some dialects of Spanish, imperatives show plural inversion and doubling (Harris and Halle, 2005; Kayne, 2010; Postma, 2013; Harris, 2017: 212; Arregi and Nevins, 2018, a.o.)

- (16) ‘Sit down! (imperative plural)’ (Arregi and Nevins, 2018: 626)
- |    |  |                |
|----|--|----------------|
| a. | /root-PL-CL.REFL/<br>/síente- <b>n</b> -se/                                  | Standard Order |
| b. | /root-PL-CL.REFL/<br>/síente- <b>n</b> -se/ → síente-se- <b>n</b>            | Inversion      |
| c. | /root-PL-CL.REFL/<br>/síente- <b>n</b> -se/ → síente- <b>n</b> -se- <b>n</b> | Doubling       |

- Arregi and Nevins (2018) argue that the plural *-n* is subject to a constraint NONINITIALITY within the post-verbal clitic group
- Inversion with a pronominal clitic (such as reflexive *-se*) or doubling both result in at least one occurrence of *-n* PL that is non-initial
- These post-syntactic operations are greedy
  - The trigger of displacement is *-n* PL due to its NONINITIALITY requirement

<sup>6</sup>The Chichewa syntactic structure [ [ [ verb root ] RECIP ] APPL ] maps to /V-A-R/ (inversion) ~/V-R-A-R/ (doubling). The string /R-A/ satisfies the Mirror Principle, and the string /A-R/ satisfies the Morphotactics.

- The undergoer of inversion and doubling is also *-n* PL
- Thus the element that undergoes displacement does so to satisfy its own requirements
- This case is different from Tiwa where the trigger (*-âng* 1SG) and target (*-m* PST) of displacement are distinct
- Post-syntactic displacement can show greed or altruism, just like narrow syntactic movement

## 6 Morphotactics and altruism beyond Tiwa

- Another pattern that appears to be altruistic on the surface is a cluster of displacement phenomena in Basque auxiliaries (Arregi and Nevins, 2012)
  - Arregi and Nevins (2012) propose that T is subject to a PENINITIALITY constraint
  - Post-syntactic displacement operations, such as ergative displacement, serve to ensure that T is in second position within the auxiliary

- (17) Ergative displacement in Alboniga Basque (Arregi and Nevins, 2012: 284)
- |    |                                       |  |
|----|---------------------------------------|--|
| a. | Base-generated order<br>/T-DAT-ERG-C/ |  |
| b. | Ergative metathesis<br>ERG-T-DAT-C    |  |
| c. | Ergative doubling<br>ERG-T-DAT-ERG-C  |  |

- Whether this pattern (along with related ones in Basque) is altruistic depends on the analysis assumed
- Arregi and Nevins (2012) argue for a Generalized Reduplication (Harris and Halle, 2005) account of ergative displacement
  - The T-DAT-ERG portion of the string is reduplicated
  - Subsequent deletion results in surface metathesis or doubling

- (18) Ergative doubling in Basque via Generalized Reduplication  
(Arregi and Nevins, 2012: 283)

T DAT ERG C →  
 [ [ T DAT > ERG ] ] C →  
 T DAT ERG - T DAT ERG C →  
 ERG T DAT ERG C

- To the extent that displacement generated by Generalized Reduplication operations can be classified as “altruistic”, this does not clearly look like altruism
  - The reduplication serves to satisfy the PENINITIALITY requirement of T
  - The material that is reduplicated (the target) includes T itself (the trigger)
- In contrast, a Generalized Reduplication account of the Tiwa facts does seem to show altruism
  - Reduplication would serve to satisfy the condition on position for *-âng* 1SG
  - The reduplicated material (the target) does *not* include *-âng* 1SG (the trigger)

- (19) Tense doubling in Tiwa via Generalized Reduplication

PST FOC 1SG →  
 [ [ PST < FOC ] ] 1SG →  
 PST FOC - PST FOC 1SG →  
 PST FOC PST 1SG

- Thus, Tiwa doubling and inversion are altruistic even under a different set of analytical assumptions, such as those of Generalized Reduplication<sup>7</sup>

<sup>7</sup>There are several reasons why we do not adopt Generalized Reduplication for our analysis. (1) In order to capture that reduplication happens at morpheme edges (not explicit in Harris and Halle, 2005), Arregi and Nevins (2012) must employ both rules and constraints in their architecture; under OT, only constraints are needed and rules are superfluous. (2) It is not clear what kind of phonological objects [ ] or > < are when they are inserted temporarily in the phonological string. (3) The reduplication rules employed violate modularity, as they reference several components across several modules (Postma, 2013). (4) Doubling as reduplication does not match the typology of partial reduplication (Harris, 2017: 211).

## 7 Conclusion

- We have argued that Tiwa shows a pattern of post-syntactic displacement that is altruistic
  - The allomorph *-âng* of 1SG agreement is inserted when the verb is marked with past tense *-m*
  - The morph *-âng* 1SG requires surface adjacency to *-m* PST
  - If the default linearization of the syntactic structure does not yield adjacency of *-âng* 1SG and *-m* PST, then *-m* PST undergoes inversion or doubling altruistically as a repair
- Similar surface patterns involving inversion and doubling can exhibit greed rather than altruism (cf. Spanish)
- The existence of greedy and altruistic patterns in post-syntactic displacement is reminiscent of greedy and altruistic movement in the narrow syntax
- Our analysis supports the claim of Arregi and Nevins (2018) that surface variation can be “localized within morphotactically grounded constraints” (674), such as conditions on position, rather than in distinct syntactic structures

## Appendix A: Comparison with phonological accounts of 1SG agreement

### Phonologically conditioned allomorphy

- Allomorphy of Tiwa 1SG agreement is described in Jose (2014) as showing sensitivity to whether the preceding segment is a consonant or vowel
  - 1SG surfaces as *-ng* after vowels
  - 1SG surfaces as *-âng* after consonants
- This account makes an unexpected prediction with respect to the realization of neutral aspect
  - NEUT aspect surfaces as *-o* after consonants and *-w* after vowels due to a ban on VV sequences in Tiwa

- Between a V-final root and 1SG agreement, we expect NEUT to be realized as *-w*
- In this context, *-w* NEUT is therefore the final consonant before 1SG
- From Jose (2014), we expect the form of 1SG to be *-âng*
- Instead, we find that 1SG is realized as *-ng*
- *-w* NEUT is deleted due to a ban on complex codas

(20) /root-NEUT-NPST-AGR/  
 /lí-w-Ø-**ng**/ [líng] \*[líwâng]  
 ‘I will go.’

- If it were possible to insert *-âng* after any consonant-final morph, we would expect unattested forms such as *liwâng*
- Thus, an account of the allomorphy of 1SG that relies purely on phonological conditioning faces challenges

### Non-allomorphic accounts

- Given the phonological similarity of the two proposed allomorphs of 1SG it may be tempting to treat them as not truly showing allomorphy
  - Only one Vocabulary Item for 1SG agreement is available
  - The realization of the vowel (and tone it hosts) is predictable by fully regular phonological processes of the language
- There are two possibilities for such a phonological account
  - The underlying form is /-ng/ with epenthesis of [â]
  - The underlying form is /-âng/ with deletion of [â]
- An epenthesis account could assume that [â] is epenthesized to repair an illicit \*Cng cluster after *-m* PST
- An epenthesis account leaves unexplained the quality of the epenthesized material
  - There is no Tiwa-internal evidence that [a] is a default vowel
  - The falling tone realized on *-âng* 1SG does not seem to be the default tone in Tiwa

- An epenthesis account does not provide an explanation for inversion and doubling
  - Inversion and doubling would actually serve to create the illicit \*Cng cluster that epenthesis repairs
  - The merge order of tense, focus, and agreement would require neither displacement nor epenthesis and should be preferred
- A deletion account could assume that [â] is deleted from *-âng* 1SG to repair an illicit \*VV sequence
- A deletion account struggles to capture data like (21)
  - Neutral aspect is typically realized as *-o* after consonants but *-w* after vowels
  - Realization of NEUT as *-w* would break up the VVV sequence, eliminating the need for [â] deletion
  - Instead, [â] does not surface and NEUT has no overt realization

(21) /root-NEUT-NPST-AGR/  
 /lí-w-Ø-**ng**/ [líng] \*[líwâng]  
 ‘I will go.’

- To account for inversion and doubling, a deletion account could posit that *-m* PST undergoes displacement to avoid a dispreferred deletion of [â]
- However, if MAX is a highly ranked constraint, it is unclear why it would not be obeyed in (21)
- Interestingly, a deletion account would still, in a sense, involve altruism, with *-m* PST undergoing displacement to allow all segments of *-âng* 1SG to be realized

## Appendix B: Post-syntactic altruism crosslinguistically

### Mobile affixation in Moro

- Mobile affixation in Moro (Jenks and Rose, 2015) appears to be altruistic
  - The default linearization of object markers is as suffixes on the verb



- Object markers can undergo post-syntactic displacement to surface as prefixes to satisfy the tone requirements of the verb macrostem

- (22) Moro mobile affixation (Jenks and Rose, 2015: 271)
- a. g-a-vələð-á-ŋá  
SM.CL-RTC-PULL-PFV-2SG.OM  
's/he pulled you'
- b. g-a-ŋá-vələð-a  
SM.CL-RTC-2SG.OM-PULL-IPFV  
's/he is about to pull you'

### Suffix doubling in Bole

- A process of suffix doubling in the Bole verb (Ryan, 2019) might also be treated as altruism
  - Subject agreement suffixes or the ventive may double to appear on both sides of a set of potential intervening suffixes
  - Doubling occurs only in the context of certain aspectual suffixes (perfective or totality) that appear after the doubled copy
  - If these aspectual suffixes trigger this post-syntactic doubling, then doubling happens altruistically to satisfy the needs of the suffix that follows the doubled copy

- (23) Bole suffix doubling (Ryan, 2019: 144)
- a. ŋgòr-**an**-ko-yi  
tie-PLS-PFV-NULLO  
'they tied it'
- b. ŋgòr-**an**-to-**an**-ko  
tie-PLS-3FEM.SGO-PLS-PFV  
'they tied her'

### References

- Arregi, Karlos, and Andrew Nevins. 2012. *Morphotactics: Basque auxiliaries and the structure of spellout*, volume 86 of *Studies in Natural Language and Linguistic Theory*. Dordrecht: Springer.
- Arregi, Karlos, and Andrew Nevins. 2018. Beware Occam's syntactic razor: Morphosyntactic analysis and Spanish mesoclisism. *Linguistic Inquiry* 49:625–683.
- Baker, Mark C. 1985. The Mirror Principle and morphosyntactic explanation. *Linguistic Inquiry* 16:373–415.
- Bennett, Ryan, Boris Harizanov, and Robert Henderson. 2018. Prosodic smothering in Macedonian and Kaqchikel. *Linguistic Inquiry* 49:195–246.
- Booij, Geert, and Rochelle Lieber. 1993. On the simultaneity of morphological and prosodic structure. In *Studies in lexical phonology*, ed. Sharon Hargus and Ellen M. Kaisse, volume 4 of *Phonetics and Phonology*, 23–44. San Diego, CA: Academic Press.
- Bošković, Željko. 1995. Case properties of clauses and the Greed Principle. *Studia Linguistica* 49:32–53.
- Bošković, Željko. 2007. On the locality and motivation of Move and Agree: An even more minimal theory. *Linguistic Inquiry* 38:589–644.
- Božič, Jurij. 2019. Constraining long-distance allomorphy. *The Linguistic Review* 36:485–505.
- Brinkerhoff, Mykel Loren. 2019. On subcategorization and PRIORITY: Evidence from Welsh allomorphy. Doctoral Dissertation, University of North Carolina at Chapel Hill.
- Chomsky, Noam. 1995. *The minimalist program*. Cambridge, MA: MIT Press.
- Dawson, Virginia. 2017. Optimal clitic placement in Tiwa. In *NELS 47: Proceedings of the Forty-Seventh Annual Meeting of the North East Linguistic Society*, ed. Andrew Lamont and Katerina Tetzloff, volume 1, 243–256. Amherst, MA: Graduate Linguistics Student Association.
- Embick, David. 2007. Linearization and local dislocation: Derivational mechanics and interactions. *Linguistic Analysis* 33:303–336.
- Embick, David, and Alec Marantz. 2008. Architecture and blocking. *Linguistic Inquiry* 39:1–53.
- Embick, David, and Rolf Noyer. 2001. Movement operations after syntax. *Linguistic Inquiry* 32:555–595.
- Foley, Steven. 2018. Morphological conspiracies in Georgian and Optimal Vocabulary Insertion. In *CLS 52: Proceedings from the Fifty-Second Meeting of the Chicago Linguistic Society*, ed. Jessica Kantarovich, Tran Truong, and Orest Xherija, 217–231. Chicago: Chicago Linguistic Society.
- Guseva, Elina, and Philipp Weisser. 2018. Postsyntactic reordering in the Mari nominal domain. *Natural Language & Linguistic Theory* 36:1089–1127.
- Halle, Morris, and Alec Marantz. 1993. Distributed Morphology and the pieces of inflection. In *The view from building 20: Essays on linguistics in honor of Sylvain Bromberger*, ed. Kenneth Hale and Samue Jay Keyser, 111–176. Cambridge, MA: MIT Press.
- Harris, Alice. 2017. *Multiple exponence*. Oxford: Oxford University Press.
- Harris, James, and Morris Halle. 2005. Unexpected plural inflections in Spanish: Reduplication and metathesis. *Linguistic Inquiry* 36:195–222.

- Hyman, Larry M. 2003. Suffix ordering in Bantu: A Morphocentric Approach. In *Yearbook of morphology 2002*, ed. Geert Booij and Jaap van Marle, 245–281. Dordrecht: Kluwer.
- Inkelas, Sharon. 1990. *Prosodic constituency in the lexicon*. Outstanding Dissertations in Linguistics. New York: Garland.
- Jenks, Peter, and Sharon Rose. 2015. Mobile object markers in Moro: The role of tone. *Language* 91:269–307.
- Jose, U.V. 2014. *Tiwa-English dictionary with English-Tiwa index*. Shillong: Don Bosco Centre for Indigenous Cultures.
- Kager, René. 1999. *Optimality theory*. Cambridge: Cambridge University Press.
- Kalin, Laura, and Nicholas Rolle. in prep. Deconstructing subcategorization. Ms., Princeton University.
- Kastner, Itamar, and Beata Moskal. 2018. Special issue on non-local contextual allomorphy. *Snippets* 34.
- Kayne, Richard S. 2010. Toward a syntactic reinterpretation of Harris & Halle (2005). In *Romance languages and linguistic theory 2008: Selected papers from 'Going Romance' Groningen 2008*, ed. Reineke Bok-Bennema, Brigitte Kampers-Manhe, and Bart Hollebrandse, 145–170. Amsterdam: John Benjamins.
- Lasnik, Howard. 1995. Case and expletives revisited: On greed and other human failings. *Linguistic Inquiry* 26:615–633.
- Lasnik, Howard. 2003. *Minimalist investigations in linguistic theory*. London: Routledge.
- Lieber, Rochelle. 1980. On the organization of the lexicon. Doctoral Dissertation, Massachusetts Institute of Technology.
- Marantz, Alec. 1988. Clitics, morphological merger, and the mapping to phonological structure. In *Theoretical morphology*, ed. Michael Hammond and Michael Noonan, 253–270. San Diego, CA: Academic Press.
- Matushansky, Ora. 2006. Head movement in linguistic theory. *Linguistic Inquiry* 37:69–109.
- McCarthy, John J., and Alan Prince. 1995. Faithfulness and reduplicative identity. In *University of Massachusetts occasional papers in linguistics 18: Papers in Optimality Theory*, ed. Jill Beckman, Laura Walsh Dickey, and Suzanne Urbanczyk, 249–384. Amherst, MA: Graduate Linguistics Student Association.
- Merchant, Jason. 2015. How much context is enough? Two cases of span-conditioned stem allomorphy. *Linguistic Inquiry* 46:273–303.
- Moskal, Beata. 2015a. Domains on the border: Between morphology and phonology. Doctoral Dissertation, University of Connecticut.
- Moskal, Beata. 2015b. Limits on allomorphy: A case study in nominal suppletion. *Linguistic Inquiry* 46:363–376.
- Moskal, Beata, and Peter W. Smith. 2016. Towards a theory without adjacency: Hyper-contextual VI-rules. *Morphology* 26:295–312.
- Noyer, Rolf. 1992. Features, positions and affixes in autonomous morphological structure. Doctoral Dissertation, Massachusetts Institute of Technology.
- Paster, Mary. 2006. Phonological conditions on affixation. Doctoral Dissertation, University of California, Berkeley.
- Postma, Gertjan. 2013. Constraining Local Dislocation dialect-geographically: V-T-AGR versus V-AGR-T in Dutch dialects. Presentation at GLOW 36.
- Prince, Alan, and Paul Smolensky. 1993. Optimality Theory: Constraint interaction in generative grammar. Technical report, Rutgers University Center for Cognitive Science.
- Rolle, Nicholas. 2019. In support of an OT-DM model. To appear, *Natural Language & Linguistic Theory*.
- Rolle, Nicholas, and Larry M. Hyman. 2019. Phrase-level prosodic smothering in Makonde. In *Supplemental proceedings of the 2018 Annual Meeting on Phonology*, ed. Katherine Hout, Anna Mai, Adam McCollum, Sharon Rose, and Matthew Zaslansky. Washington, DC: Linguistic Society of America.
- Rolle, Nicholas, and Florian Lionnet. 2019. Phantom structure: A representational account of floating tone association. Presentation at the 7th Annual Meeting on Phonology.
- Ryan, Kevin M. 2010. Variable affix order: Grammar and learning. *Language* 86:758–791.
- Ryan, Kevin M. 2019. Bole suffix doubling as morphotactic extension. In *Schuhschrift: Papers in honor of Russell Schuh*, ed. Margit Bowler, Philip T. Duncan, Travis Major, and Harold Torrence, 139–160. Los Angeles: University of California.
- Smith, Peter W., Beata Moskal, Ting Xu, Jungmin Kang, and Jonathan David Bobaljik. 2019. Case and number suppletion in pronouns. *Natural Language & Linguistic Theory* 37:1029–1101.
- Trommer, Jochen. 2001a. Distributed optimality. Doctoral Dissertation, University of Potsdam.
- Trommer, Jochen. 2001b. A hybrid account of affix order. In *CLS 37: Proceedings from the Thirty-Seventh Meeting of the Chicago Linguistic Society*, ed. Mary Andronis, Christopher Ball, Heidi Elston, and Sylvain Neuvel, volume 2, 469–480. Chicago: Chicago Linguistic Society.
- Trommer, Jochen. 2002. Modularity in OT-morphosyntax. In *Resolving conflicts in grammar: Optimality Theory in syntax, morphology, and phonology*, ed. Gisbert Fanselow and Caroline Féry. Special Issue 11 of *Linguistische Berichte*.
- Tyler, Matthew. 2019. Simplifying MATCH WORD: Evidence from English functional categories. *Glossa: A Journal of General Linguistics* 4(15):1–32.
- Wolf, Matthew. 2008. Optimal interleaving: Serial phonology-morphology interaction in a constraint-based model. Doctoral Dissertation, University of Massachusetts Amherst.
- Yip, Moira. 2002. *Tone*. Cambridge: Cambridge University Press.
- Yu, Alan C. L. 2007. The phonology-morphology interface from the perspective of infixation. In *New challenges in typology: Broadening the horizons and redefining the foundations*, ed. Matti Miestamo and Bernhard Wälchli, 35–54. Berlin: Mouton De Gruyter.
- Zec, Draga. 2005. Prosodic differences among function words. *Phonology* 22:77–112.
- Zyman, Erik. 2017. P'urhepecha hyperraising to object: An argument for purely altruistic movement. *Proceedings of the Linguistic Society of America* 2:53:1–15.