

Chapter 1

Prosodic smothering is idiosyncratic and lexical

Ryan Bennett

University of California, Santa Cruz

Prosodic units, such as the phonological phrase ϕ , typically correspond to morpho-syntactic units, such as XPs. However, prosodic effects associated with individual morphemes may idiosyncratically disrupt these correspondences. In particular, some morphemes may condition ‘prosodic smothering’, a pattern in which outer morphemes trigger restructuring of inner prosodic domains. Most analyses of smothering assume that prosodically exceptional elements (i) have regular, unremarkable syntax; and (ii) are lexically specified for their unique prosodic effects. An alternative is to assume that (i) the syntax of smothering triggers is special; and (ii) their prosodic behavior follows directly from their special syntax. Here, I argue against the command-based theory of smothering proposed by [Branan \(2023\)](#), and in favor of the larger claim that smothering effects cannot be reduced to syntactic differences. Instead, I offer an analysis in the COPHONOLOGIES-BY-PHASE framework ([Sande et al. 2020](#)). Regardless of the specific implementation, prosodic smothering requires idiosyncratic lexical specification.

Keywords: prosody, prosodic smothering, exceptions, Makonde, Macedonian

1 Introduction

Functional items, including both function words and affixes, sometimes show idiosyncratic or otherwise non-uniform phonological behavior (e.g. [Inkelas 1990](#), [Selkirk 1995](#), [Zec 2005](#), [Peperkamp 1997](#), and many others). For example, in British English, the preposition *via* is apparently the only function word which participates in a process of [ɪ]-insertion at word boundaries ([Tyler 2019](#)). In Irish, demonstratives are unusual among function words in forming full prosodic words of

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their own (Bennett et al. 2016). More broadly, the level-ordering architecture of Lexical Phonology/Stratal OT is motivated in part by the finding that affix classes may have systematic phonological differences (e.g. Bermúdez-Otero 2017 and references there).

Functional items — particularly affixes — may also impose idiosyncractic phonological requirements on the elements they combine with. These requirements can affect how *prosodically integrated* functional morphemes are with their hosts.

To illustrate, consider two English prefixes (1): negative *in-*, as in *in-considerate*; and negative *un-*, as in *un-defeated*. Phonologically, *in-* forms a single stress domain with the stem it attaches to. This can be diagnosed by the fact that *in-* may bear the sole stress in the word, e.g. *ín-finite*, *ím-potent*, etc. This indicates that *in-* belongs to the same prosodic word (ω) as its stem (1a).¹

- (1) English negative *un-*: [*un-* [...] ω] ω
 a. [*ín-finite*] ω
 b. [*ùn-* [*fínished*] ω] ω

In contrast, negative *un-* is consistently outside the domain of primary stress, as in *ùn-finished*, *ùn-interested*, etc. This is an indication that *un-* stands outside the prosodic word of its stem (1b).

The prosodic contrast between *in-* and *un-* can be implemented by means of LEXICAL SUBCATEGORIZATION.² Assume that negative *un-* has a subcategorization requirement like [*un-* [...] ω] ω . This stipulates that *un-* must be separated from its stem by a prosodic word boundary (ω). The presence of this intervening ω boundary ensures a lack of phonological ‘coherence’ between *un-* and its host. As the prefix *in-* lacks a prosodic subcategorization frame, it is instead prosodically integrated into a single ω with its host (the default pattern for affixes).

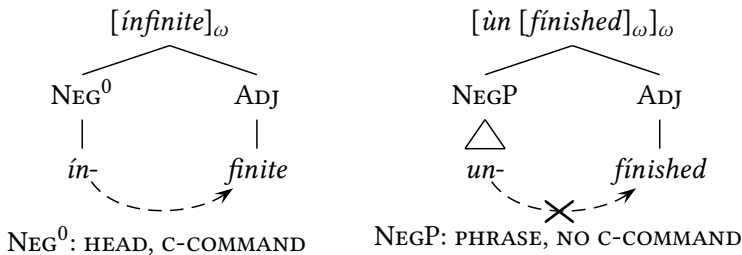
Phonological subcategorization frames have been criticized for being stipulative and non-explanatory, and for failing to capture broader grammatical generalizations (e.g. Bonet et al. 2007, Wolf 2008, Bonet & Harbour 2012, Bennett 2017). In turn, proponents of subcategorization have argued that some degree of synchronic stipulation is sometimes unavoidable when dealing with morpheme-specific prosodic requirements (e.g. Yu 2003, Paster 2006). Still, whenever subcategorization frames are invoked in an analysis, it seems fair to ask whether more explanatory alternatives might be available instead.

¹I’m simplifying here: examples like *in-décent* show that *in-* does not always bear primary stress, even when otherwise eligible. Notably, *un-* never bears primary stress (Allen 1979: 16).

²Prosodic subcategorization frames have been invoked in many analyses of morphological and/or phonological patterns. For reasons of space I do not provide a thorough list here, but see e.g. Inkelas (1990), Zec (2005), Paster (2006), Bennett et al. (2018) for discussion and citations.

Along these lines, it has been proposed that at least some prosodic differences between functional items can be derived from deeper syntactic differences. This is illustrated for negative *in-* and *un-* in (2). If we assume that e.g. *in-* is a syntactic head, while *un-* is a syntactic phrase, then *in-* and *un-* will stand in different structural relations with their stems.³ If phonology is sensitive to structural relations in the syntax — and in particular, c-command relations — then the prosodic differences between *in-* and *un-* might follow straightforwardly, without stipulation (for proposals that c-command at least partially determines prosodic patterning, see [Kaisse 1985](#), [Kalivoda 2018](#), [Branan 2023](#) and the detailed discussion below).

(2) English negative prefixes: does syntax determine parsing?



In this chapter, I approach these issues through the lens of PROSODIC SMOTHERING, a phenomenon in which certain morphemes idiosyncratically force their hosts to be prosodically restructured (section 2). [Bennett et al. \(2018\)](#) and [Rolle & Hyman \(2019\)](#) have analyzed prosodic smothering by means of idiosyncratic lexical subcategorization frames. In contrast, [Branan \(2023\)](#) has proposed that at least some cases of prosodic smothering can be reduced to underlying syntactic differences between morphemes.

I will argue that prosodic smothering effects *must* be stipulated: they are truly idiosyncratic properties of individual morphemes or morpheme classes, and cannot be derived from other grammatical properties of the items in question. In section 5 I sketch an analysis of prosodic smothering in the COPHONOLOGIES BY PHASE model of [Sande et al. \(2020\)](#), which implements phonological idiosyncrasy by allowing individual morphemes to shape the grammar of prosodic parsing.

2 Prosodic smothering

PROSODIC SMOTHERING refers to a phenomenon in which an outer morpheme ‘compresses’ an inner morpheme (or word) into a smaller prosodic domain than

³See [Newell \(2008: 175-83\)](#) for a proposal in this spirit, which nonetheless differs from the sketch analysis in (2) in several important respects.

(5) Default ϕ -phrasing in noun phrases in Zanzibar Makonde⁴

- a. (vi-lo \hat{o} ngo) ϕ (vi-k \acute{u} m \acute{e} ne) ϕ (vy-á naáswe) ϕ (vi-vi \acute{i} li) ϕ
 CL8-pot CL8-big CL8-GEN white CL8-two
 ‘two big white pots’ (Manus 2010: 170)
- b. (NOUN) ϕ (ADJ) ϕ (ADJ) ϕ (NUM) ϕ

Phonological phrasing in Zanzibar Makonde can be diagnosed by penultimate lengthening within ϕ , as well as various tonal changes; see Manus (2003), Manus (2010) for details. Penultimate lengthening is shown via underlining in (5)-(7).

Demonstratives occur at the right edge of the noun phrase. Unlike other noun modifiers, demonstratives form a single ϕ with the preceding noun (6).

(6) Basic demonstrative phrasing in Zanzibar Makonde

- a. (lí-jémbé aliilá) ϕ
 CL5-hoe CL5.DEM
 ‘that hoe’ (Manus 2010: 163)
- b. (NOUN DEM) ϕ

The same phrasing occurs even when noun modifiers intervene between the demonstrative and the noun: in such constructions, the entire noun phrase is parsed into a single, shared ϕ (7). This phrasing can be diagnosed by the absence of penultimate lengthening on any word except the demonstrative, as well as by the presence of a high tone plateau on all words preceding the demonstrative (compare (7) to (5) above).

(7) Phrase-level smothering by demonstratives in Zanzibar Makonde⁵

- a. (ví-lóngó ví-k \acute{u} m \acute{e} né vy-á náswé ví-víli aviilá) ϕ
 CL8-pot CL8-big CL8-GEN white CL8-two CL8.DEM
 ‘those two big white pots’ (Manus 2010: 170)
- b. (NOUN ADJ ADJ NUM DEM) ϕ

Descriptively, outer demonstratives seem to erase the ϕ boundaries that would normally separate the noun and each of its modifiers, even when those boundaries are several words away from the demonstrative itself. This is prosodic smothering.

⁴Genitive marking on *naáswe* ‘white’ in (5) indicates that it is a derived (deverbal) adjective; see Makanjila (2019: Ch. 5.2). It is also possible that such adjectives are a type of (reduced) relative clause (Manus 2010: 171).

⁵I will sometimes indicate SMOTHERING TRIGGERS with boxed text.

Rolle & Hyman (2019) analyze the smothering pattern in (7) by means of a prosodic subcategorization frame for demonstratives: $(\text{NOUN}_{\text{HD}} \dots \boxed{\text{DEM}})_{\phi}$. This subcategorization frame requires that all demonstratives occur in a single, flat ϕ with their associated head noun, and any intervening material. (By ‘flat’, I mean ‘non-recursive’, i.e. $(\text{NOUN DEM})_{\phi}$ rather than $((\text{NOUN})_{\phi} \text{DEM})_{\phi}$; see e.g. Itô & Mester 2013, Bennett et al. 2018 and section 5.1 below.)

3.1 Arguments against lexical subcategorization

Branan (2023) critiques the use of lexical subcategorization in the analysis of smothering effects in Makonde along several lines. First, Branan argues that lexical prespecification is not sufficiently restrictive. This point is well-taken: subcategorization frames like $(\text{NOUN}_{\text{HD}} \dots \boxed{\text{DEM}})_{\phi}$ are powerful devices, in that they express non-local relations between non-adjacent elements (e.g. between DEM and NOUN_{HD} , regardless of what intervenes). And at present, there is no broader theory of what kinds of elements can be referred to by frames of this type. Prosodic subcategorization frames like $(\text{NOUN}_{\text{HD}} \dots \boxed{\text{DEM}})_{\phi}$ might then massively over-predict the range of prosodic smothering effects actually attested in natural language.

Second, Branan notes that most cases of prosodic smothering documented to date involve CATEGORY-LEVEL behavior. In Makonde, for example, it is the entire class of demonstratives which triggers ϕ -level smothering. Subcategorization frames are intended to express morpheme-specific requirements (section 1). Item-specific subcategorization does not explain why prosodic smothering triggers seem to form coherent syntactic classes.

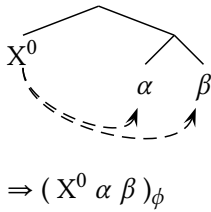
3.2 Smothering via command relations

Branan (2023) develops an alternative, syntactically-oriented analysis of Zanzibar Makonde within the framework of COMMAND THEORY (Kalivoda 2018). In Command Theory, prosodic phrasing at the ϕ level is determined by c-command relations between terminal nodes in the syntax. The basic principles of Command Theory are embodied in the violable, Optimality Theoretic constraints in (8).

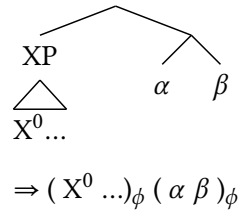
- (8) Command-Theoretic parsing constraints (Kalivoda 2018, Branan 2023)
 - a. TOGETHER (9):
If terminal X c-commands terminal Y, X and Y must be in a ϕ together.
 - b. APART (10):
If terminal X is *not* in a c-command relationship with terminal Y, X and Y must be in *separate* ϕ s

The basic effects that these constraints have on ϕ -phrasing are shown in (9) and (10). When a higher syntactic node c-commands one or more lower nodes, the grammar prefers those nodes to be parsed into the same ϕ (9). In the absence of c-command, the default is for terminal nodes to phrase separately (10).

(9) C-command:



(10) No c-command (X^0 embedded):

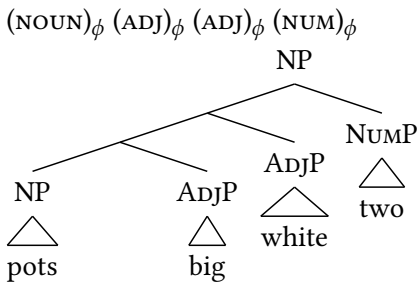


Only c-command by *terminals* (X^0 s) matters for ϕ -phrasing in Command Theory. C-command by *phrases* (XPs) is entirely irrelevant for prosodic parsing in this framework.

3.2.1 Demonstrative smothering in Zanzibar Makonde

Branan's (2023) Command Theoretic analysis of demonstrative smothering in Zanzibar Makonde proceeds as follows. First, assume that noun modifiers are generally full XPs in Zanzibar Makonde, as in (11).

(11) *Parse apart* without DEM: no c-command relations *between words*

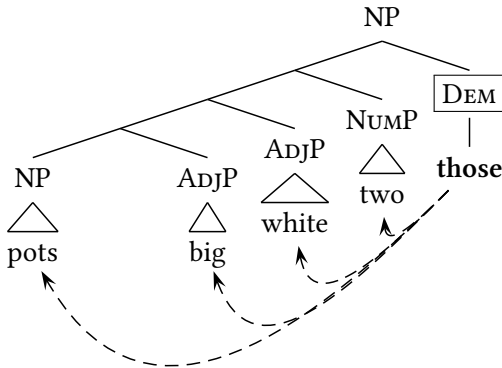


The structure in 11 ensures that there will be no c-command relations, of any sort, between nouns and noun modifiers. (Again, it is important that only c-command between *terminal nodes* matters for ϕ -phrasing in this framework.) The constraints TOGETHER and APART (8) then predict that nouns and noun modifiers should all phrase into their own independent ϕ s (11).

Now, assume that demonstratives differ from other noun phrase modifiers in being heads, rather than full XPs. Since demonstratives are peripheral within the

noun phrase, it is plausible that they attach high within the NP (12). In such a configuration, DEM will c-command the noun and all noun phrase modifiers (12).

- (12) *Parse together* when DEM c-commands all terminals
 (NOUN ADJ ADJ NUM DEM) $_{\phi}$



Given the constraint TOGETHER (8), this analysis correctly predicts that DEM should form a single, flat ϕ with all other words in the noun phrase.

The central claim of Branan’s (2023) Command-Theoretic analysis is that prosodic smothering in Zanzibar Makonde reduces to an underlying syntactic difference between demonstratives (= X^0 heads) and other noun phrase modifiers (= XPs). There are several appealing aspects of this analysis. First, it straightforwardly captures the fact that demonstratives behave as a class for prosodic smothering in Zanzibar Makonde. This follows from the assumption that syntactic structure is built with reference to lexical categories, not individual lexical items (e.g. Chomsky 1965).

Second, this analysis relies on a theory of prosodic phrasing – Command Theory – which was originally proposed for unrelated reasons (Kalivoda 2018). There is little in the way of new formal machinery here, which counts in favor of the approach.

Lastly, Command Theory makes no reference to subcategorization, or to other types of arbitrary lexical specification. In that sense, it appears to be less stipulative than comparable analyses which rely on subcategorization (section 3).

However, I will argue that this last advantage is only apparent: the Command Theoretic analysis of prosodic smothering in Makonde still requires considerable stipulation to get off the ground.

3.3 Smothering by c-command is still stipulative

It is critical that demonstratives be heads, not phrases, for the Command-Theoretic analysis sketched above to work. The obvious question is whether there is any independent evidence for this claim.

Branan (2023) suggests that certain morphological facts support the claim that demonstratives are heads rather than phrases in Zanzibar Makonde. He notes (p.115) that “Non-demonstrative modifiers...take a prefixal class marker”, while “Demonstratives likewise display concord...[but the marker] appears to be suffixal and drawn from a separate paradigm”. This is illustrated in (13); class markers are underlined.

- (13) (ví-lóngó ví-kúméné vy-á náswé ví-vílí a-vii-lá)_ϕ
 CL8-pot CL8-big CL8-GEN white CL8-two DEM-CL8-DEM.DIST
 ‘those two big white pots’ (Manus 2010: 170)

The claim, then, is that both (i) prefixation vs. suffixation, and (ii) morphological paradigm structure, diagnose a structural difference between XP vs. X⁰ modification in Zanzibar Makonde.

There are several issues with this claim. The first concerns the assumption that prefixation vs. suffixation is informative about the syntactic status of demonstratives as X⁰ heads vs. XP phrases.

Class marking does appear to be suffixal on proximal demonstratives in Zanzibar Makonde (14) (I discuss other demonstratives below).

- (14) Proximal demonstratives
 mí-lándy’ áá-ì (NOUN DEM)_ϕ
 CL4-tree DEM.PROX-CL4
 ‘these (proximal) trees’ (Manus 2003: 102)

Still, I am skeptical that the distinction between prefixation and suffixation tells us much about syntax (cf. Branan 2023: 115-6). To give just one example: it has been argued that verb-initial word order is produced by roll-up verb movement in both Irish and Kaqchikel (e.g. McCloskey 1996, Clemens & Coon 2018). Subject agreement on verbs is suffixal in Irish, but prefixal in Kaqchikel. This difference is surprising if the direction of affixation is dependent on syntax. While it may be possible to explain away individual cases of this type, I doubt that the direction of affixation can, in general, be taken as a reliable diagnostic for anything syntactic.

Furthermore, there are reasons to doubt that class marking is suffixal on all demonstratives in Zanzibar Makonde. First, the same DEP I paradigm which marks noun class agreement on demonstratives can occur in other constructions. In those constructions, class marking occurs word-initially, and so cannot be suffixal (15) (see also (18), (20) below).

- (15) Word-initial DEP I class marking
lú-péèmbè lúù-ɲjì
CL11-horn CL11-other
'another horn' (Manus 2003: 107)

Second, in other varieties of Makonde, class marking can occur word-initially even on demonstratives, when the initial demonstrative morpheme is dropped (16).

- (16) Word-initial class marking on demonstratives in Chinnima Makonde
n-dídí (a-)uu-lá
CL3-rope (DEM-)CL3-DEM.DIST
'that rope' (Kraal 2005: 85,132-7; see also Devos 2008: 168-75,
Makanjila 2019: 141-4)

This pattern is obviously also incompatible with treating demonstrative class markers as suffixal.

Manus (2003) does not discuss demonstratives in which the initial demonstrative morpheme has been omitted, so I do not know if this pattern also occurs in Zanzibar Makonde (though I suspect it does). For what it's worth, Manus (2010: 163) explicitly states that glosses like 'Dem5' "[do] not mean that the class marker is suffixed" on demonstratives.

Branan's (2023) second claim is that class markers follow a different paradigm on demonstratives than on other nominal modifiers (in particular, adjectives). It is true that the paradigm for class marking on demonstratives is slightly different from the paradigm for adjective concord. Adjective class prefixes are identical to demonstrative class prefixes *except* in classes 1, 4, and 6 (17). (The loss of vowels in demonstrative class markers reflects a tonally-conditioned hiatus avoidance process, Manus 2003: 101-9.)

(17) Adjective vs. demonstrative noun class markers in Zanzibar Makonde

(Manus 2003: 37-9,46-7,55,80,93-100)

CLASS	ADJ	DEM	NOUN
1	mu-, N _i -	j(u)-	mu-, N _i -
4	mi-	i-	mi-
6	ma-	l(a)-, a-	ma-

The difference in class marking for adjectives and demonstratives in (17) could be taken as evidence that demonstratives are indeed X⁰ heads rather than XPs in Zanzibar Makonde.

However, this analysis predicts a neater correlation between class marking and prosody than we actually observe. Differences between class marking paradigms are attributed to the X⁰ vs. XP status of modifiers; this is also the factor which is supposedly responsible for differences in prosodic phrasing across modifiers. If both class marking and phrasal prosody reflect the syntactic distinction between X⁰ vs. XP modifiers, they should be tightly correlated – but they are not.

Demonstratives carry class markers belonging to the DEP I paradigm. Importantly, the DEP I paradigm also occurs on modifiers in other constructions (18).

- (18) a. sǐ́-nú **sǐ́**-nǐ̀ (NOUN)_φ (OTHER)_φ
 CL7-thing CL7-other
 ‘another thing’
- b. mùú-nú **jùú**-mò (NOUN)_φ (ONE)_φ
 CL1-person CL1-one
 ‘one person’

(Manus 2003: 106-7)

Modifiers bearing DEP I class marking may prosodically phrase with the noun, or phrase separately, depending on the construction (18, 19) (Manus 2003: 93-118, Manus 2010; see also Rolle & Hyman 2019).

(19) No correlation between CL1 marking and prosodic phrasing

CONSTRUCTION	CL1 PREFIX	PROSODIC PHRASING	PARADIGM
NOUN + ADJ	mu-, N _i -	(NOUN) _φ (ADJ) _φ	ADJ
NOUN + DEM	j(u)-	(NOUN DEM) _φ	DEP I
NOUN + OTHER/ONE	j(u)-	(NOUN) _φ (OTHER/ONE) _φ	DEP I
NOUN + GEN + NOUN	u-	(NOUN) _φ (GEN NOUN) _φ	DEP II
NOUN + POSS	u-	(NOUN POSS) _φ ~ (NOUN) _φ (POSS) _φ	DEP II

The same dissociation between class marking and prosodic structure can be seen for the DEP II paradigm in the last two rows of (19).

Such dissociations are problematic for the claim that class marking paradigms track the X^0 vs. XP status of modifiers. After all, the X^0 vs. XP distinction is also supposed to explain the prosody of noun modifiers: this wrongly predicts a strong correlation between prosody and noun class paradigms.

The fact that demonstratives follow a different class marking paradigm than adjectives and numerals does suggest some underlying difference between these modifiers. But this is trivially true: demonstratives belong to a different lexical category than adjectives, numerals, etc. That fact alone could explain the patterns at hand – there is no need to assume that class marking paradigms reflect deeper, structural properties of the syntax itself (see also Branagan 2023: 115-6,123,129). (Indeed, exactly the same point can be made about the fact that class marking appears to be suffixal, rather than prefixal, on proximal demonstratives.) I conclude that class marking paradigms do not support the claim that demonstratives are X^0 heads rather than full XPs.

If anything, the morphological structure of demonstratives in Zanzibar Makonde suggests that they are phrasal. Demonstratives in Makonde are multi-partite and internally complex. They consist of a generic demonstrative element *a-*, followed by a class marker, and finally a morpheme indicating the distal or anaphoric character of non-proximal demonstratives (20) (Manus 2003: 102-5).

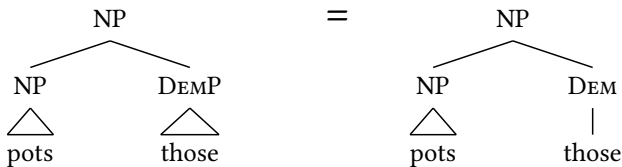
- (20) a. Proximal demonstratives: DEM-CLASS
 lú-pémby’ áá-lù (NOUN DEM)_ϕ
 CL11-horn DEM-CL11
 ‘this (proximal) horn’
- b. Distal demonstratives: DEM-CLASS-DEM.DIST
 lú-pémbé à-lù-lá (NOUN DEM)_ϕ
 CL11-horn DEM-CL11-DEM.DIST
 ‘that (distal) horn’
- c. Anaphoric demonstratives: : DEM-CLASS-DEM.ANAPH
 lú-pémbé àà-lw-ó (NOUN DEM)_ϕ
 CL11-horn DEM-CL11-DEM.ANAPH
 ‘that (previously mentioned) horn’

To the extent that morphological complexity is diagnostic of syntactic complexity, then the morphological evidence implies that demonstratives are phrasal XPs in Zanzibar Makonde, *not* simplex X^0 heads.

Indeed, it has been argued that, universally, demonstratives are syntactic phrases composed of a definite marker, an agreement marker, and a deictic/anaphoric element within a complex XP (Leu 2015). This corresponds, rather exactly, to the structure of the demonstrative in Zanzibar Makonde (20).

There thus appears to be no compelling, independent evidence for the purported X^0 status of demonstratives in Zanzibar Makonde. There is also a somewhat technical argument against this claim. In BARE PHRASE STRUCTURE, there is no meaningful difference between an X^0 head and an XP which is internally non-branching (21) (Chomsky 1995).

(21) Non-branching $DEMP = DEM^0$ in Bare Phrase Structure



If bare phrase structure is adopted, then the crucial structural distinction between bare X^0 heads and non-branching XPs (11, 12) cannot even be formulated, much less used to explain the prosody of demonstratives.⁶

3.3.1 Interim summary

The Command Theory analysis of prosodic smothering in Zanzibar Makonde hinges on the claim that demonstratives are unique among nominal modifiers in being X^0 heads. I have argued that this is not plausible or well-motivated.

Because Command Theory is a *general* theory of the syntax-prosody interface, it is poorly suited to deal with truly idiosyncratic patterns. Only one strategy can be pursued: special prosody must reflect special syntax. But in this case, the requisite ‘special syntax’ is simply not credible, on either syntactic or morphological grounds. It is at best a stipulation, and at worst incorrect.

Despite these criticisms, the Command Theory analysis retains one important advantage over lexical subcategorization: it accounts for the fact that demonstratives behave as a class for prosodic smothering in Zanzibar Makonde.

In the following section I discuss prosodic smothering in Macedonian. The Macedonian case is important because Command Theory is plainly unable to generate the observed prosodic facts. Hence, any purported advantages of Command Theory are rendered moot.

⁶Branan (2023) neither explicitly adopts nor explicitly rejects bare phrase structure. My point here is that *if* bare phrase structure is desirable, for whatever reason, that will pose problems for the Command-Theoretic analysis in Branan (2023).

4 Prosodic smothering in Macedonian

Macedonian shows prosodic smothering at the ω level, involving negation and *wh*-expressions. It is discussed in detail by Bennett et al. (2018). Evidence for prosodic smothering in Macedonian comes from the system of stress assignment. Following Bennett et al. (2018), I focus on Western Macedonian.

4.1 The basic stress pattern: antepenultimate

Default stress in Western Macedonian is antepenultimate, or initial in words of 1-2 syllables (22). I indicate stress by means of capitalization, following most prior literature on Macedonian prosody. Examples are given in a Romanized orthography.

- (22) Default antepenultimate stress
- a. proizVEduva ‘produce (3SG.IMPF.PRS)’
 - b. proIZvede ‘produce (3SG.PST)’
 - c. PROizvod ‘product’
 - d. VOdi ‘lead (3SG.IMPF.PRS)’
 - e. LIK ‘figure, image’ (Tomić 2012: 53-9)

Macedonian has a number of pronominal and clausal proclitics which precede verbs. These proclitics are typically unstressed, even when antepenultimate in the verbal complex (23).

- (23) Pronominal and clausal proclitics outside the domain of stress
- a. mi go [DAle] ‘They gave it to me.’
 - b. *[mi GO dale] (Rudin et al. 1999: 553)
 - c. da [Odiš] ‘You should go!’
 - d. *[DA odiš] (Tomić 2012: 33)

I assume that the domain of stress is the prosodic word ω . It follows that pronominal and clausal proclitics are outside of the ω containing the verb (24).

- (24) Default verb prosody: CLITIC(S) [VERB] ω

4.2 Exceptional stress domains triggered by functional items

The stress domain of the verb expands leftward in the presence of two types of functional item: negation (section 4.2.1), and *wh*-expressions (section 4.2.2).

4.2.1 Negation

In the presence of the negative marker *ne*, the stress domain of the verb expands to include negation, as well as any intervening clitics (25). This can be diagnosed by the fact that preverbal clitics may take the sole stress of the verbal complex when preceded by *ne*, if they are in antepenultimate position.

(25) [NEG (CLITICS) HOST]_ω

(26) [**ne** **mu** **GI** **dava**]_ω [jaBOLkata]_ω
NEG 3SG.M.DAT 3PL.ACC give.3SG.PRS the.apples

‘(s)he is not giving him the apples.’ (Tomić 2012: 66)

This constitutes prosodic smothering: the negative marker *ne* is ‘compressing’ intervening clitics into a smaller prosodic domain than they would otherwise belong to (section 2). It is exactly analogous to the flattening of ϕ structure by demonstratives in Zanzibar Makonde (section 3).

The negative marker *ne* may itself be stressed when antepenultimate in the verbal complex (27).

(27) [NE **znam**]_ω
 NEG know.1SG.PRS

‘I don’t know’ (Lunt 1952: 23, Friedman 2010: 254)

This confirms that negation is also within the ω sponsored by the verb.

4.2.2 *Wh*-expressions

The very same pattern of smothering occurs with interrogative *wh*-expressions in Macedonian (28). This is illustrated for matrix *wh*-questions in (29).

(28) [WH (CLITICS) HOST]_ω

(29) Matrix *wh*-questions

a. [koj **TI** **veli**]_ω?
 who.NOM 2SG.DAT say.3SG.PRS

‘Who says so to you?’

b. [KAJ **saka**]_ω da [Odi]_ω [TOJ]_ω?
 where want.3SG.PRS to go.3SG.PRS he

‘Where does he want to go?’

(Lunt 1952: 23, Koneski 1987: 168-9, Rudin et al. 1999: 557)

Smothering occurs inside of complex *wh*-expressions (30) as well.

(30) Complex *wh*-expressions

[**kaKOV** fustan]_ω [SAkaš]_ω?
 what.kind.SG.M dress want.2SG.PRS

‘What kind of dress do you want?’

(Tomić 2012: 420)

Smothering also occurs with interrogative *wh*-expressions in embedded clauses, and in exclamatives (31). (Example 31a further illustrates smothering by negation *ne*.)

(31) a. *wh*-expressions in embedded clauses

[**NE** znaeš]_ω [TI]_ω [**kako** SE žali]_ω ...
 NEG know.2SG.PRS you how REFL sorrow.3SG.PRS ...

‘You don’t know how one sorrows...’

(Lunt 1952: 24)

b. Exclamatives

[**kaKO** griziš]_ω [JABloka]_ω!
 how chew.2SG.PRS apples

‘the way you chew apples!’

(Hendriks 1976: 95)

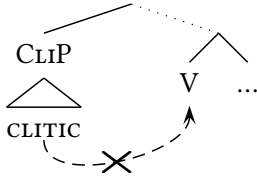
Non-interrogative *wh*-constructions, such as relative clauses and adjunct modifiers, do not show prosodic smothering in Macedonian; see Bennett et al. (2018). I comment on this briefly in section 5.2 (footnote 13).

Bennett et al. (2018) analyze prosodic smothering in Macedonian with lexical subcategorization frames. Here, I argue that these patterns cannot be analyzed in Command Theory (section 4.3). Then, in section 5.2, I provide an analysis of in the Cophonologies-by-Phase framework.

4.3 Macedonian smothering in Command Theory

Command Theory requires several problematic assumptions to analyze prosodic smothering in Macedonian. First, pronominal and clausal proclitics normally phrase apart from the following verb. It follows that there cannot be any c-command relations between proclitics and verbs. This requires clitics to be embedded inside an XP phrase of some type (32).

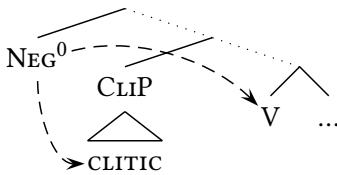
(32) Most verbal proclitics: inside XP



No c-command:
CLITICS [VERB]_ω

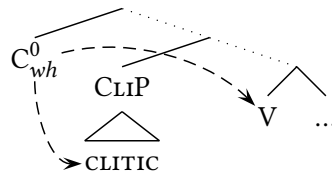
In contrast, negation and *wh*-words phrase together with a following verb, and any intervening clitics. Hence, negation and *wh*-words must differ in being high, c-commanding heads (33), (34).

(33) Negation: X⁰ head



C-command:
[NEG (CLITICS) HOST]_ω

(34) *Wh*-words: X⁰ heads



C-command:
[WH (CLITICS) HOST]_ω

Immediate problems arise for this analysis. First, simplex *wh*-words are phrases, not merely heads. This is clear from the fact that they undergo long-distance, cross-clausal, phrasal \bar{A} -movement (35).

(35) KAJ saka [da Odi TOJ _____]_{CLAUSE?}
 where want.3SG.PRS to go.3SG.PRS he
 ‘Where does he want to go?’

(29b) above

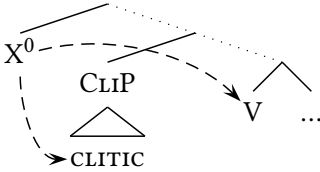
Second, Command Theory determines ϕ parsing, not ω parsing. It has nothing to say about the organization of prosodic words (i.e. stress domains).

Third, and most problematically, it is empirically false that c-commanding heads in the clausal spine trigger smothering effects. Smothering effects are truly limited to negation and interrogative *wh*-words, as I now show.

4.3.1 Other functional heads in the clausal spine

A clear prediction of the Command Theory analysis of Macedonian is that *any* c-commanding head positioned above pre-verbal proclitics should trigger prosodic smothering (36).

(36) Generic smothering by clausal heads



C-command:

[X⁰ (CLITICS) HOST]_ω

This prediction is easily falsified. There are numerous heads in the clausal spine which c-command the verb, and which do not trigger prosodic smothering (see e.g. Tomić 2001, 2012 on Macedonian clausal structure). This is illustrated for a range of clausal elements in (37).

(37) a. Auxiliaries

i. k'e se [VENča]_ω
 will REFL marry.3SG
 'He will get married'

ii. *[k'e SE venča]_ω

b. Subjunctive marking

i. [MISlam]_ω **da** [DOJdam]_ω
 I.think SUBJ come
 'I intend to come.'

ii. *[MISlam]_ω [**DA** dojdám]_ω

c. Complementizers

i. **deka** [DOšol]_ω
 that come.3SG.PST
 'that he came'

ii. *[**deKA** došol]_ω

(Franks 1987: 129, Tomić 2012: 357)

These functional heads fail to expand the stress domain, but *can* themselves be stressed when preceded by negation or a *wh*-word (38). In other words, these

clausal heads are *compatible* with enlarged stress domains, but do not trigger them.

- (38) a. [**ne** K'E može]_ω
 NEG will be.able.3SG
 'He will not be able'
 b. [**što** DA pravam]_ω
 what SUBJ do.1SG
 'What should I do?' (Franks 1987: 120)

The lack of smothering with other clausal heads can't be attributed to locality: the heads in question are *more local* to the verb than NEG or *wh*-words (Tomić 2012: 233; note that negation may occur in two distinct 'slots' in the clausal spine).

- (39) Order of clausal morphemes in Macedonian
 (?INTER) MOOD **NEG1** MOD MOOD **NEG2** AUX DAT ACC (S)_E
 (Tomić 2012: 227,233)
 a. [**ne** sum mu GO dala]_ω
 NEG am.CLI to.him.CLI it.CLI given
 'I haven't given it to him' (Tomić 2001: 653)
 b. [**što** da TI dadam]_ω?
 what SUBJ you.CLI give
 'What should I give you?' (Tomić 2012: 421)

Finally, to rescue the Command Theory account of smothering in Macedonian, one could argue that non-smothering clausal morphemes are XPs rather than heads. Doing so would break c-command relations between these particles and the lower verb, as in (32), and the desired prosodic phrasing CLITICS [VERB]_ω would follow.

This, too, seems implausible. I am aware of no morphological, syntactic, or scopal evidence that auxiliaries, mood marking, or complementizers (37) are fully phrasal XPs in Macedonian (see e.g. Zanuttini 2001 for discussion of relevant diagnostics). This seems particularly unlikely in the case of complementizers, which are standardly analyzed as selecting C⁰ heads.

As Branagan (2023: 131) points out, a strength of Command Theory is that it predicts correlations between prosodic patterning and syntactic phenomena like scope and movement (and I would add, selection). But with respect to prosodic smothering in Macedonian, the predicted correlations are not borne out.

This is not to suggest that Command Theory itself is flawed. The point is more narrow: as a *general* theory of the syntax-prosody interface, Command Theory is not well-suited for modeling truly idiosyncratic prosodic patterns. Additional, item-specific machinery of some kind must be invoked as well.

5 A Cophonologies-by-Phase analysis of prosodic smothering

In this section I outline some analyses of prosodic smothering in the Cophonologies-by-Phase (CxP) framework (Sande et al. 2020). The appeal of CxP in this context is that it is architecturally designed for item-specific phonological behavior.⁷

The CxP framework builds on earlier work in Cophonology Theory, which assumes that different morphological constructions may be associated with different phonological sub-grammars, depending on the particular morphemes they contain (e.g. Anttila 2002, Inkelas & Zoll 2007, and references there). As in Cophonology Theory, CxP is implemented in Optimality Theory (or when weighted constraints are desired, in a variant of Harmonic Grammar). The most important commitments of CxP for present purposes are listed in (40).

(40) Some important commitments of Cophonologies-by-Phase (CxP)

- a. MORPHEME-SPECIFIC CONSTRAINT RANKING:
Individual morphemes may be associated with idiosyncratic constraint rankings (or weightings).
- b. SCOPE:
Phonological evaluation occurs once per syntactic phase (on phases, see e.g. Citko 2014 and references there).
- c. ACTIVITY:
Morpheme-specific constraint rankings only take effect within the most local phase containing them.

CxP is thus designed to implement morpheme-specific phonological patterns.

CxP can also model phonological idiosyncrasy at the level of entire lexical or functional categories (Sande et al. 2020). It does this by associating morpheme-specific constraint rankings with functional heads in the syntax, e.g. with categorizing heads *n*, *v*, etc.; with inflectional heads like T; etc. Reference to more specific category types such as T_[PAST] is also possible. This property of CxP is critical for implementing category-level prosodic smothering.

⁷I thank Arto Anttila for encouraging me to consider analyses along these lines, and for helpful comments which guided my thinking here.

5.1 A CxP analysis of prosodic smothering in Zanzibar Makonde

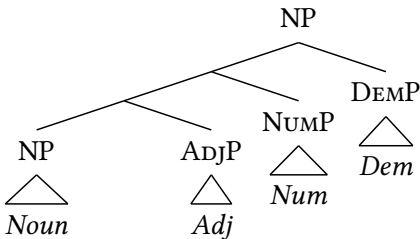
In Zanzibar Makonde, the default prosodic phrasing for complex noun phrases is for the noun and each modifier to parse into its own phonological phrase ϕ (41) (section 3).

- (41) Default prosody of the noun phrase in Zanzibar Makonde
 (NOUN) $_{\phi}$ (ADJ) $_{\phi}$ (NUM) $_{\phi}$

I am agnostic as to the source of this default prosody, or the particular framework used to model it. Depending on the syntax one assumes, this default parse could be modeled using Match Theory (e.g. Selkirk 2011), edge-based alignment (e.g. Truckenbrodt 1999), Command Theory (e.g. Kalivoda 2018), CxP (e.g. Sande et al. 2020), or other frameworks.

For concreteness, I assume the syntax in (42) for the noun phrase in Zanzibar Makonde (see Makanjila 2019 for a different view). I take all noun modifiers, including demonstratives, to be phrasal. This is supported by (i) the articulated internal structure of demonstratives (section 3.3); (ii) the existence of complex numerals like *màkùúmi mwàânù* ‘50 (lit. 10, 5)’ (Manus 2003: 123-9, Kraal 2005: Ch. 4.7); and (iii) the fact that adjectives may be modified by intensifiers, as in *síkúmeêne nameêne* ‘very big’ (Manus 2010: 168, Makanjila 2019: 207-8).⁸

- (42) Assumed NP syntax in Zanzibar Makonde



The noun modifiers in (42) could be XP adjuncts, or could occur in specifiers of NP. This issue doesn't have major consequences for the proposal below, though it could affect the mechanical details of how syntax is mapped to prosody (e.g. Bellik & Kalivoda 2015).

I assume that the outermost layer of the noun phrase is the determiner phrase DP, which constitutes a phase (e.g. Citko 2014: Ch. 4.3). Hence, NP structures

⁸The distribution of penultimate lengthening in complex numerals and intensified adjectives suggests that they contain multiple ϕ -phrases. For reasons of space and focus, I set this aside in my analysis.

like (42) will be sister to a D^0 phase head, $[D_{PH}^0 [NP]]_{DP}$. This D^0 phase head plays an important role in the analysis: prosodically, it forces the entire NP to map to a ϕ , thereby creating recursively nested $((Noun)_\phi (XP)_\phi \dots)_\phi$. In the presence of a demonstrative, recursive nesting of ϕ is avoided by ‘smothering’ the entire NP into the single, topmost ϕ associated with the D^0 phase head $(Noun XP \dots Dem)_\phi$.

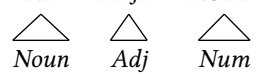
I further assume that syntactic structure is related to ϕ structure by means of ALIGN constraints (e.g. Truckenbrodt 1999). Here, I make use of the constraint ALIGN-R(XP, ϕ) (43).

- (43) ALIGN-R(XP, ϕ) (syntax \Rightarrow prosody):
 Assign one violation for every XP such that its right edge does not coincide with the right edge of a ϕ .

Again, I have no particular commitment to an ALIGN-based theory of syntax-prosody mapping. That said, ALIGN constraints will be useful in the analysis of Macedonian in section 5.2, and so I adopt them here as well.

In the absence of a demonstrative, the default phrasing in Zanzibar Makonde places the noun and each of its modifiers in a separate ϕ . This prosody reflects the importance of high-ranking ALIGN-R(XP, ϕ), which demands that the right edge of each XP coincide with the right edge of a ϕ (44).⁹

- (44) Default NP prosody in Zanzibar Makonde

[NP ADJP NUMP] _{NP}	ALIGN-R(XP, ϕ)
	
a. $\text{☞} (Noun)_\phi (Adj)_\phi (Num)_\phi$	
b. $(Noun Adj Num)_\phi$	*!* W

The prosodic structure in (41, 44) does not include a ϕ corresponding to the entire, complex noun phrase. I assume there is in fact an outer ϕ containing the entire NP (e.g. Selkirk 2011), though that assumption certainly needs to be justified empirically.

- (45) Default prosody of the noun phrase, with assumed outer ϕ shell
 $((Noun)_\phi (Adj)_\phi (Num)_\phi)_\phi$

⁹The recursive parse $(((Noun)_\phi Adj)_\phi Num)_\phi$ would also fully satisfy ALIGN-R(XP, ϕ). I’m unaware of any empirical evidence which would distinguish this structure from (44a). Either parse would be compatible with the analysis of prosodic smothering sketched here.

As we will see shortly, this outer ϕ shell helps drive prosodic smothering: it creates a recursive ϕ structure, which is avoided in the presence of a demonstrative by flattening the phrasal prosody to $(Noun\ Adj\ Num\ Dem)_\phi$.

The presence of this outer ϕ shell owes to the DP phase which contains the entire NP, $[D_{PH}^0 [NP]]_{DP}$. In CxP, it is assumed that there is a violable preference for parsing all material in the current phase into a single prosodic domain.¹⁰ I implement this preference with the constraint PHASE-TO- ϕ (46) (see also Cheng & Downing 2016, Ishihara & Kalivoda 2022 for citations to other work relating syntactic phases to ϕ s).

- (46) PHASE-TO- ϕ
Assign one violation for each phase which does not correspond to a ϕ in the output (cf. MAXIMIZE PROSODIC DOMAINS in Sande et al. 2020: 1222).

The constraint PHASE-TO- ϕ must outrank NON-RECURSIVITY(ϕ) (47) in order to produce the desired, nested parse (48a).

- (47) NON-RECURSIVITY(ϕ):
Assign a violation for every ϕ dominated by another ϕ .
(e.g. Selkirk 1995, Truckenbrodt 1999)

- (48) Outer ϕ shell in Zanzibar Makonde NPs

$[D_{PH}^0 [\begin{array}{c} NP \\ \triangle \\ Noun \end{array} \begin{array}{c} ADJP \\ \triangle \\ Adj \end{array} \begin{array}{c} NUMP \\ \triangle \\ Num \end{array}]_{NP}]_{DP}$	ALIGN-R(XP, ϕ)	PHASE-TO- ϕ	NONREC(ϕ)
a. $\mathbb{E}^{\infty} ((Noun)_\phi (Adj)_\phi (Num)_\phi)_\phi$			***
b. $(Noun)_\phi (Adj)_\phi (Num)_\phi$		*! W	L
c. $(Noun\ Adj\ Num)_\phi$	*! W		L

Candidate (48c) shows that ALIGN-R(XP, ϕ) must also outrank NON-RECURSIVITY(ϕ) to ensure that the noun and its modifiers each form their own ϕ .

Demonstratives trigger a flattening of the ϕ -structure of the noun phrase (49), i.e. prosodic smothering.¹¹

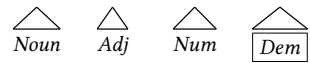
¹⁰More precisely: Sande et al. (2020) assume that there is a preference for parsing entire *spell-out domains* to prosodic constituents; for them, a spell-out domain consists of a phase head and its complement (pp.1220-2). This corresponds to $[D_{PH}^0 NP]$ in the present analysis.

¹¹A reviewer notes that in Chimaraba Makonde, demonstratives may be prenominal, in which case they are phrased $(DEM)_\phi (NOUN)_\phi$, in contrast to postnominal $(NOUN\ DEM)_\phi$ (Odden 1990: 93-4, Rolle & Hyman 2019). However, prenominal demonstratives are contrastively focused in Chimaraba Makonde (Makanjila 2019: Ch.4), which likely accounts for the presence of a ϕ boundary separating the demonstrative from the following noun (e.g. Féry 2013).

- (49) Smothering by demonstratives in Zanzibar Makonde
 (*Noun Adj Num* Dem) ϕ

Prosodic smothering in Zanzibar Makonde can be modeled in CxP if some functional head associated with demonstratives – call it *Deixis* (Leu 2015: 12) – triggers a constraint ranking in which NON-RECURSIVITY(ϕ) (47) is undominated. In this construction-specific constraint ranking, the preference for a flat (= non-recursive) ϕ structure will take precedence over default prosodic parsing. In particular, promoting NON-RECURSIVITY(ϕ) over ALIGN-R(XP, ϕ) will cause the entire noun phrase to be parsed into a single ϕ : this is prosodic smothering, triggered by the functional head *Deixis* and its associated construction-specific constraint ranking (50).

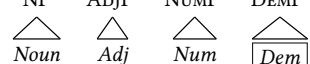
- (50) Demonstrative smothering in Zanzibar Makonde

[D ⁰ _{PH} [NP AdjP NUMP DEM ⁰ P] _{NP}] _{DP}	NONREC(ϕ)	ALIGN-R(XP, ϕ)
		
a. \mathbb{E}^{∞} (<i>Noun Adj Num</i> Dem) ϕ		***
b. ((<i>Noun</i>) ϕ (<i>Adj</i>) ϕ (<i>Num</i>) ϕ (Dem) ϕ) ϕ	*!*** W	L

The scope of this constraint ranking is the full noun phrase. As discussed above, I assume the outer layer of the noun phrase is the DP, which is a phase. Phases determine the scope of morpheme-specific constraint rankings. As such, any noun phrase containing a demonstrative will be subject to the ‘flattening’ of ϕ structure seen in (50). Since cophological rankings are phase-bounded (40c), this flattening effect will also be *limited* to the noun phrase – it will not have scope over the broader sentence.

One additional candidate needs to be considered, in which NONREC(ϕ) is satisfied by omitting the *outermost* ϕ , rather than the smaller ϕ s associated with each noun modifier (51b). This candidate can be eliminated with the ranking PHASE-TO- ϕ \gg ALIGN-R(XP, ϕ), which will favor a single ϕ encompassing the entire NP (51a).

- (51) Demonstrative smothering in Zanzibar Makonde

[D ⁰ _{PH} [NP AdjP NUMP DEM ⁰ P] _{NP}] _{DP}	PHASE-TO- ϕ	ALIGN-R(XP, ϕ)
		
a. \mathbb{E}^{∞} (<i>Noun Adj Num</i> Dem) ϕ		***
b. (<i>Noun</i>) ϕ (<i>Adj</i>) ϕ (<i>Num</i>) ϕ (Dem) ϕ	*! W	L

The ranking PHASE-TO- ϕ \gg ALIGN-R(XP, ϕ) (50) could be part of the default ranking of Zanzibar Makonde, as it doesn't affect the basic, recursive ϕ parse found in the absence of demonstratives (48).

In summary, prosodic smothering in Zanzibar Makonde can be analyzed as the idiosyncratic avoidance of recursive ϕ structures, triggered by the presence of an outer demonstrative in the NP.

5.1.1 Coastal Shimakonde

The analysis of Zanzibar Makonde potentially extends to Coastal Shimakonde, a closely related Makonde variety. In Coastal Shimakonde, adjectives trigger prosodic smothering. Noun modifiers normally phrase apart from their nouns (52a), but adjectives cause a prosodic flattening of the entire noun phrase (52b).

(52) Smothering by adjectives in Coastal Shimakonde (Liphola 2001: 392-403)

- a. (mapapáaja) ϕ (mataátu) ϕ (NOUN) ϕ (NUM) ϕ
 CL6.papayas CL6.three
 'three papayas'
- b. (mápápájá mātátú mángúlúuuma) ϕ (NOUN NUM ADJ) ϕ
 CL6.papayas CL6.three CL6.round
 'three round papayas'

This pattern falls out from the assumption that the same cophonology associated with the *Deixis* head in Zanzibar Makonde above is instead associated with the category-defining *a* head on adjectives in Coastal Shimakonde. For more complex patterns that a full-fledged analysis of Coastal Shimakonde would need to contend with, see Liphola (2001), Rolle & Hyman (2019), Branán (2023), and section 5.3.

As a point of theory comparison, it is worth noting that Branán's (2023) analysis of Coastal Shimakonde depends on syntactic assumptions which are even less plausible than those made for Zanzibar Makonde (section 3.3). In particular, Branán (§2.3) assumes that adjectives are direct complements to nouns, [N⁰ [ADJP]]_{NP}, so that nouns will c-command adjectives and thus be forced to phrase into a ϕ with them. This is at odds with all standard analyses of adjective modification (e.g. Leu 2015: Ch. 3.4). It also appears to be factually incorrect: multiple adjectives can co-occur in Coastal Shimakonde (53), as expected if they are adjuncts instead of selected complements.

- (53) (lí-ndándóshá lí-kúméné lí-ngúlúguuma)_ϕ (NOUN ADJ ADJ)_ϕ
 CL5-ghost CL5-big CL5-round
 ‘big round ghost’
 (Liphola 2001: 412-3)

The Coastal Shimakonde data discussed in Liphola (2001), Makanjila (2019), Rolle & Hyman (2019), and Branán (2023) is complex, and there are significant challenges for any analysis. But the syntactic contortions required in the Command Theory analysis suggest that this approach is on the wrong track.¹²

5.2 A CxP analysis of prosodic smothering in Macedonian

The CxP analysis of prosodic smothering in Macedonian proceeds along similar lines. I propose that the exceptional prosody of negation and *wh*-words reflects a morpheme-specific STRONGSTART(ϕ) effect (54).

- (54) STRONGSTART(ϕ)
 Assign one violation for every ϕ which does not begin with a phonological word ω .
 (Werle 2009, Selkirk 2011, Elfner 2012, Bennett et al. 2016)

STRONGSTART(ϕ) is normally low-ranked in Macedonian, which explains the permissibility of the default phrasing (CLITIC [VERB] _{ω}) _{ϕ} (56) (see also Harizanov 2014). Specifically, STRONGSTART(ϕ) must be outranked by ALIGN-L(LEX, ω), which requires the left edge of a lexical word to coincide with the left edge of a prosodic word (56).

- (55) ALIGN-L(LEX, ω) (syntax \Rightarrow prosody)
 Assign one violation for every lexical word with a left edge that does not align with the left edge of a prosodic word.
 (e.g. Selkirk 1995, Werle 2009)

¹²Branán’s (2023) analysis of Coastal Shimakonde also requires the assumption that NumP is sometimes a left adjunct to NP (when adjectives are present), and sometimes a right adjunct (in the absence of adjectives), despite invariant NOUN NUM order. Further, raising of N⁰ to a position above NumP must take place, but only when an adjective is present. The role of the adjective is thus to induce an otherwise unexplained and unmotivated deformation of the syntax, in order to get the prosody to come out right within Command Theory. Branán (2023: 121-2) directly addresses these points, but not the point raised above about the stacking of adjective modifiers.

Some of Branán’s (2023) syntactic commitments reflect separate considerations about word-order typology. It would also be possible to assume a more streamlined analysis in which adjectives are X⁰ heads which adjoin high in the NP spine, on par with the analysis of demonstrative smothering in Branán (2023). This proposal would be subject to essentially the same criticisms raised here for Zanzibar Makonde.

(56) Default ω parsing in Macedonian

	[CLITICS VERB] _{CP}	ALIGN-L(LEX, ω)	STRONGSTART
a.	☞ (CLITICS [VERB] _{ω}) ϕ		*
b.	([CLITICS VERB] _{ω}) ϕ	*! W	L

However, in constructions with negation or a *wh*-word, STRONGSTART(ϕ) is promoted to undominated status.¹³ This accounts for the leftward extension of the ω associated with the verb in these constructions.

(57) Prosodic smothering in Macedonian

	[NEG/WH CLITICS VERB] _{CP}	STRONGSTART	ALIGN-L(LEX, ω)
a.	☞ ([NEG/WH CLITICS VERB] _{ω}) ϕ		*
b.	([NEG/WH CLITICS [VERB] _{ω}) ϕ	*! W	L

The scope of STRONGSTART(ϕ) effects should be the first phase containing negation or the *wh*-word, which I take to be the containing CP (or in the case of complex *wh*-phrases like [*kaKOV fustan*] _{ω} ‘what kind of dress’ (30), another containing, phasal XP).

Some additional candidates must again be excluded. Following Bennett et al. (2018), I assume that ALIGN-R(ω , LEX) (58) is high-ranking in Macedonian.¹⁴

(58) ALIGN-R(ω , LEX) (prosody \Rightarrow syntax)

Assign one violation for every prosodic word with a right edge that does not align with the right edge of a lexical word.

ALIGN-R(ω , LEX) eliminates candidates which attempt to satisfy STRONGSTART by parsing clitics into a prosodic word of their own (59). Effectively, prosodic words are only licensed when they contain a lexical word at their right edge.

¹³ More specifically, only interrogative *wh*-words trigger smothering in Macedonian: non-interrogative *wh*-words in relative clauses and adjunct modifiers do not affect stress domains. Interrogative *wh*-words can be analyzed as the natural class of morphemes bearing the features [+WH, +Q] (Bennett et al. 2018, Sande et al. 2020).

¹⁴ ALIGN-R(ω , LEX) could be replaced with any constraint that effectively minimizes the number of prosodic words overall, e.g. * ω . In any event, *something* must enforce the typological observation that function words do not normally sponsor prosodic words of their own; ALIGN-R(ω , LEX) does that work here.

(59) Prosodic smothering in Macedonian

	[NEG/WH CLITICS VERB] _{CP}	STRSTART	AL-R(ω , LEX)	AL-L(LEX, ω)
a. [NEG/WH]	([NEG/WH CLITICS VERB] _{ω}) _{ϕ}			*
b.	([NEG/WH CLITICS] _{ω} [VERB] _{ω}) _{ϕ}		*! W	L

In summary, prosodic smothering in Macedonian can be analyzed as the idiosyncratic avoidance of ϕ -initial weak elements, triggered by the presence of negation or an interrogative *wh*-expression.

5.3 Prosodic smothering as markedness avoidance

Interestingly, prosodic ‘smothering’ is not really a coherent phenomenon in the CxP analyses above. Certain morphemes trigger cophonologies, and these cophonologies sometimes trigger unusual prosodic effects, like prosodic reparsing. But from the perspective of CxP, there is nothing ‘deep’ about this observation: prosodic smothering is just one of the many expected outcomes of allowing item-specific co-grammars.

In both Zanzibar Makonde and Macedonian, smothering is triggered when low-ranked constraints on prosodic structure (NONREC(ϕ), STRSTART) are promoted above constraints which prefer transparent mappings from syntax to prosody (here, ALIGN constraints). ‘Smothering’ thus amounts to the emergence of markedness preferences which are normally subordinated in each language. The promotion of markedness constraints has also been proposed for morphologically-conditioned phonological patterns which are totally unrelated to prosodic smothering (e.g. Inkelas & Zoll 2007, Sande et al. 2020).

An advantage of this approach is that it can account for both ϕ -level smothering and ω -level smothering within the same framework. In contrast, since Command Theory is intended only to model ϕ -phrasing, it provides no means to analyze ω -level smothering effects like those seen in Macedonian.

A reviewer notes that CxP allows for lower (inner) morphemes to affect the phonology of higher (outer) morphemes, as long as those morphemes are within the same lowest containing phase (Sande et al. 2020). This predicts that a smothering trigger \mathcal{M} could force the prosodic restructuring of an outer, structurally higher morpheme A, as shown schematically in (60).

(60) ‘Outward’ prosodic smothering

- a. A [B]_{XP} → A [B] _{π}
- b. A [M B]_{XP} → [A M B] _{π} (outward smothering by \mathcal{M})

Rolle & Hyman (2019) dub patterns like (60) ‘outward’ smothering, and observe a case of this type in Coastal Shimakonde (Liphola 2001).

In Coastal Shimakonde, nouns generally phrase apart from their modifiers. However, adjectives smother their associated nouns into a single, shared ϕ , (NOUN ADJ) ϕ . In section 5.1.1 I attributed this effect to the promotion of NONREC(ϕ) to undominated status: adjectives ban recursive ((NOUN) ϕ (XP) ϕ (ADJ) ϕ) ϕ , so the phrasing (NOUN XP ADJ) ϕ occurs instead.

Adjectives trigger the same smothering effect when they modify coordinated nouns (61). Though coordinated nouns normally phrase into separate ϕ s (61a,b), in the presence of a modifying adjective they phrase together, along with the adjective itself (61c,d).

(61) Smothering of coordinated nouns by adjectives in Coastal Shimakonde

- a. (n-kóongwé) ϕ na (li-putipúúti) ϕ
CL1-woman and CL5-sheep
‘woman and sheep’
- b. (NOUN) ϕ & (NOUN) ϕ
- c. (n-kóongwé ná n-númé vá-díkidiiki) ϕ
CL1-woman and CL1-man CL2-small
‘small [woman and man]’ (= both are small)
- d. (NOUN & NOUN ADJ) ϕ (Liphola 2001: 420-3)

Somewhat surprisingly, the same ϕ phrasing obtains even when the adjective has narrow scope, modifying only the second noun, rather than the entire coordination structure (62).

- (62) a. (n-kóongwé ná lí-pútípúúti lí-díkidiiki) ϕ
CL1-woman and CL5-sheep CL5-small
‘woman and [small sheep]’ (= only the sheep is small)
- b. (NOUN & NOUN ADJ) ϕ
- c. *(NOUN) ϕ & (NOUN ADJ) ϕ
- d. *(NOUN) ϕ & (NOUN) ϕ (ADJ) ϕ (Liphola 2001: 420-3)

This is an instance of outward smothering: the adjective ‘small’ in (62) affects the prosody of the first noun ‘woman’, even though that noun is in a structurally higher position in the syntax.

Outward smothering is predicted by the CxP analysis in section 5.1.1. Adjectives are associated with a constraint ranking in which NON-RECURSIVITY(ϕ) (47) is undominated. I again assume that the actual prosody of examples like (61a,b) is $((\text{NOUN})_\phi \& (\text{NOUN})_\phi)_\phi$, with an outer ϕ shell corresponding to the entire NP (section 5.1). NONREC(ϕ) penalizes this recursive ϕ structure, favoring flat $(\text{NOUN} \& \text{NOUN ADJ})_\phi$ whenever an adjective is present. This is true regardless of what noun(s) the adjective modifies in the syntax.

The scope of this adjective-specific constraint ranking is the lowest phase containing the adjective: this is just the entire noun phrase (section 5.1). Hence, the adjective ‘small’ in (62) is able to affect the prosody of the structurally higher noun ‘woman’, because the two words are in the same phase.¹⁵

I consider the existence of outward smothering patterns like (62) to be a confirmation of the predictions of the CxP framework. This further supports the view that smothering patterns reflect idiosyncratic, morpheme-specific rankings of markedness constraints.¹⁶

5.4 CxP as a general approach to prosodic smothering

Branan (2023) raises several important critiques of lexical subcategorization as a tool for the analysis of prosodic smothering effects. I believe that the CxP analyses presented above go at least some way toward addressing those issues.

First, the CxP analyses developed here are arguably more restrictive than the subcategorization frames used in previous work on prosodic smothering. For example, Rolle & Hyman (2019) propose the frame $(\text{NOUN}_{\text{HD}} \dots \boxed{\text{DEM}})_\phi$ for Zanzibar Makonde (see also Bennett et al. 2018). This subcategorization frame is expressively powerful: in particular, it is non-local, as it refers to non-adjacent elements which are potentially separated by an unbounded distance.

In contrast, the constraints used above involve only local relations between grammatical units. Furthermore, these constraints have all been proposed on independent grounds, on the basis of prosodic patterning in other languages.

¹⁵This presumes that examples like (62) involve coordination of NP, or something smaller. If (62) instead involved coordination of DPs, the first and second conjuncts would be contained in different phases, and the cophonology of the second conjunct would not scope over the first.

¹⁶Branan’s (2023) analysis of (62) (p.121-6) invokes a high-ranking constraint against ϕ phrases containing more than two children. This constraint rules out the phrasing $*(\text{NOUN} \& \text{NOUN})_\phi$ for simple noun coordination, in favor of $(\text{NOUN})_\phi (\& \text{NOUN})_\phi$.

I believe this makes the incorrect prediction that $[\text{NOUN NUM ADJ}]$ should be parsed $*(\text{NOUN NUM})_\phi (\text{ADJ})_\phi$, rather than the attested $(\text{NOUN NUM ADJ})_\phi$ (52b), given the c-command relations assumed in Branan (2023: 121). For reasons of space, I do not demonstrate this claim in further detail here, as Branan’s analysis requires some additional assumptions about constraint interaction which would need to be unpacked.

This highlights an important property of cophologies: all morpheme- or construction-specific grammars must correspond to possible *default* patterns in human language. That requirement also increases the restrictiveness of the CxP framework relative to lexical subcategorization.

Second, [Branan \(2023\)](#) notes that prosodic smothering often involves entire natural classes of morphemes. This is implemented in CxP by associating cophologies with abstract functional heads (similar to the association of subcategorization with abstract features in [Bennett et al. 2018](#)). An additional advantage of CxP is that it has the flexibility to associate cophologies with individual morphemes, as well as entire grammatical categories.

Command Theory struggles with item-specific and/or idiosyncratic behavior, because it is not designed (or intended!) to deal with true exceptions. In its barest form, Command Theory has no choice but to yoke special prosody to special syntax. This can force the analyst to make implausible syntactic commitments. But exceptionality is in the bones of CxP, which frees the theory from making deeper syntactic claims when confronted with exceptional prosodic patterns.

To be clear, I am neither advocating against Command Theory, nor in favor of CxP as such. Command Theory may be an appealing general theory of the syntax-prosody interface (e.g. [Kalivoda 2018](#)); I take no stance on this here. Similarly, CxP has been critiqued on a number of grounds, and it is by no means clear that it represents the best theory of item-specific phonological effects, or prosodification (e.g. [Cheng & Downing 2016](#), [Zimmermann 2023, 2025](#)).

I *do* want to commit myself to two claims. First, I have argued that prosodic smothering in Makonde and Macedonian is truly idiosyncratic, and not reducible to deeper grammatical facts. Second, I believe there is promise in localizing that idiosyncrasy in item-specific, phonological sub-grammars of some type (see also [Hsu 2019](#)). But regardless of the specific implementation, prosodic smothering requires *some* sort of lexical specification.

It remains something of a puzzle why smothering effects appear, in general, to be specified at the level of entire lexical categories. I speculate that this is an artifact of grammatical learning. Language learners tend to generalize aggressively (e.g. [Yang 2016](#), [Linzen & Gallagher 2017](#), and references there). Aggressive generalization will naturally lead to patterns operating over natural classes, rather than individual items.

Along similar lines, items with the same special prosody may trace that prosody back to a shared diachronic source — the explanation for category-level behavior would thus be historical, not synchronic (see e.g. [Manus 2010: 170](#)). For example, the unusual prosody of *ne* and *wh*-expressions in Macedonian may trace back

to intonational patterns associated with focus or other information-structural factors (see e.g. Harizanov 2011).

6 Conclusion

It is easy to interpret item-specific behavior as peripheral or marginal when trying to understand how phonological systems work. But I hope to have shown that the investigation of item- and category-specific phonology can shed light on deeper architectural questions, and on the role of explanation vs. stipulation in phonological theory.

I have argued that some prosodic patterns are irreducibly idiosyncratic and item-specific. It is possible that I am wrong on this point. But for the moment at least, deeper synchronic explanations for the patterns discussed here seem elusive.

Acknowledgements

Thanks to Arto Anttila, Dan Brodtkin, Lauren Clemens, Boris Harizanov, Nik Rolle, and Matt Tyler for comments. This work has benefited from feedback from audiences at the *International Workshop on Metrical Phonology* (University of València, June 2024), the *Phonological Domains and What Conditions Them* workshop (UC Berkeley, September 2024), and UC Berkeley's *Phorum*.

Abbreviations

2 = 2nd person; 3 = 3rd person; AUX = auxiliary; ACC = accusative; ADJ = adjective; CLI = clitic; CL# = noun class #; CP = clause; DAT = dative; DEM = demonstrative; DEP = dependent; DIST = distal; GEN = genitive; HD = head; IMPF = imperfective; INTER = interrogative; M = masculine; MOD = modal; NEG = negative; NUM = number; PL = plural; PH = phase head; POSS = possessive; PROX = proximal; PRS = present; PST = past; REFL = reflexive; SG = singular; SUBJ = subjunctive; ω = prosodic word (aka phonological word); ϕ = phonological phrase

References

Allen, Margaret. 1979. *Morphological investigations*. University of Connecticut. (Doctoral dissertation).

- Anttila, Arto. 2002. Morphologically conditioned phonological alternations. *Natural Language & Linguistic Theory* 20(1). 1–42. DOI: [10.1023/a:1014245408622](https://doi.org/10.1023/a:1014245408622).
- Bellik, Jennifer & Nick Kalivoda. 2015. Adjunction and branchingness effects in syntax-prosody mapping. In Gunnar Ólafur Hansson, Ashley Farris-Trimble, Kevin McMullin & Douglas Pulleyblank (eds.), *Proceedings of the Annual Meetings on Phonology*, vol. 3. Washington, DC: Linguistic Society of America. DOI: [10.3765/amp.v3i0.3690](https://doi.org/10.3765/amp.v3i0.3690). <https://journals.linguisticsociety.org/proceedings/index.php/amphonology/article/view/3690>.
- Bennett, Ryan. 2017. Output optimization in the Irish plural system. *Journal of Linguistics* 53(2). 229–277. DOI: [10.1017/S002222671500033X](https://doi.org/10.1017/S002222671500033X).
- Bennett, Ryan, Emily Elfner & Jim McCloskey. 2016. Lightest to the right: an anomalous displacement in Irish. *Linguistic Inquiry* 47(2). 169–234. DOI: [10.1162/LING_a_00209](https://doi.org/10.1162/LING_a_00209).
- Bennett, Ryan, Boris Harizanov & Robert Henderson. 2018. Prosodic smothering in Macedonian and Kaqchikel. *Linguistic Inquiry* 46(2). 195–246. DOI: [10.1162/ling_a_00272](https://doi.org/10.1162/ling_a_00272).
- Bermúdez-Otero, Ricardo. 2017. Stratal phonology. In S.J. Hannahs & Anna Bosch (eds.), *The Routledge handbook of phonological theory*, 100–134. Abingdon: Routledge. DOI: [10.4324/9781315675428](https://doi.org/10.4324/9781315675428).
- Bonet, Eulàlia & Daniel Harbour. 2012. The architecture of grammar and the division of labour in exponence. In Jochen Trommer (ed.), *The phonology and morphology of exponence: the state of the art*, 195–235. Oxford, UK: Oxford University Press. DOI: [10.1093/acprof:oso/9780199573721.003.0002](https://doi.org/10.1093/acprof:oso/9780199573721.003.0002).
- Bonet, Eulàlia, Maria-Rosa Lloret & Joan Mascaró. 2007. Allomorph selection and lexical preferences: two case studies. *Lingua* 117(6). 903–927. DOI: [10.1016/j.lingua.2006.04.009](https://doi.org/10.1016/j.lingua.2006.04.009).
- Branan, Kenyon. 2023. A Command Theoretic approach to prosodic smothering. *Syntax* 26(2). 107–136. DOI: [10.1111/synt.12249](https://doi.org/10.1111/synt.12249).
- Cheng, Lisa & Laura Downing. 2016. Phasal syntax = cyclic phonology? *Syntax* 19(2). 156–191. DOI: [10.1111/synt.12120](https://doi.org/10.1111/synt.12120).
- Chomsky, Noam. 1965. *Aspects of the theory of syntax*. Cambridge, MA: MIT press.
- Chomsky, Noam. 1995. Bare phrase structure. In Héctor Campos & Paula Kempchinsky (eds.), *Evolution and revolution in linguistic theory: studies in honor of Carlos P. Otero*, 51–109. Washington, DC: Georgetown University Press.
- Citko, Barbara. 2014. *Phase theory: an introduction*. Cambridge, UK: Cambridge University Press.
- Clemens, Lauren Eby & Jessica Coon. 2018. Deriving verb-initial word order in Mayan. *Language* 94(2). 237–280. DOI: [10.1353/lan.2018.0017](https://doi.org/10.1353/lan.2018.0017).

- Devos, Maud. 2008. *A grammar of Makwe (Palma; Mozambique)*. Munich: Lincom Europa.
- Elfner, Emily. 2012. *Syntax-prosody interactions in Irish*. Amherst, MA: University of Massachusetts, Amherst. (Doctoral dissertation).
- Féry, Caroline. 2013. Focus as prosodic alignment. *Natural Language & Linguistic Theory* 31(3). 683–734. DOI: [10.1007/s11049-013-9195-7](https://doi.org/10.1007/s11049-013-9195-7).
- Franks, Steven. 1987. Regular and irregular stress in Macedonian. *International Journal of Slavic Linguistics and Poetics* 35-36. 93–142.
- Friedman, Victor A. 2010. Macedonian. In Bernard Comrie & Greville G. Corbett (eds.), *The Slavonic languages*, 249–305. New York, NY: Routledge.
- Harizanov, Boris. 2011. *Separating word-level and intonational prominence: the accentual properties of negation in Bulgarian*. Ms., University of California, Santa Cruz.
- Harizanov, Boris. 2014. The role of prosody in the linearization of clitics: evidence from Bulgarian and Macedonian. In Cassandra Chapman, Olena Kit & Ivona Kučerová (eds.), *Formal Approaches to Slavic linguistics* 22, 109–130. Ann Arbor, Michigan: Michigan Slavic Publications.
- Hendriks, P. 1976. *The Radožda-Vevčani dialect of Macedonian*. Lisse: The Peter de Ridder Press.
- Hsu, Brian. 2019. Exceptional prosodification effects revisited in Gradient Harmonic Grammar. *Phonology* 36(2). 225–263. DOI: [10.1017/S0952675719000125](https://doi.org/10.1017/S0952675719000125).
- Inkelas, Sharon. 1990. *Prosodic constituency in the lexicon*. New York: Garland.
- Inkelas, Sharon & Cheryl Zoll. 2007. Is grammar dependence real? A comparison between cophological and indexed constraint approaches to morphologically conditioned phonology. *Linguistics* 45(1). 133–171. DOI: [10.1515/ling.2007.004](https://doi.org/10.1515/ling.2007.004).
- Ishihara, Shinichiro & Nick Kalivoda. 2022. Match theory: an overview. *Language and Linguistics Compass* 16(1). e12446. DOI: [10.1111/lnc3.12446](https://doi.org/10.1111/lnc3.12446).
- Itô, Junko & Armin Mester. 2013. Prosodic subcategories in Japanese. *Lingua* 124. 20–40. DOI: [10.1016/j.lingua.2012.08.016](https://doi.org/10.1016/j.lingua.2012.08.016).
- Kaisse, Ellen. 1985. *Connected speech: the interaction of syntax and phonology*. New York: Academic Press.
- Kalivoda, Nicholas. 2018. *Syntax-prosody mismatches in optimality theory*. University of California, Santa Cruz. (Doctoral dissertation).
- Koneski, Blaže. 1987. *Gramatika na makedonskiot literaturni jazik*. Skopje: Kultura.
- Kraal, Peter. 2005. *A grammar of Makonde (Chinnima, Tanzania)*. Leiden, Netherlands: University of Leiden. (Doctoral dissertation).

- Leu, Thomas. 2015. *The architecture of determiners*. Oxford, UK: Oxford University Press.
- Linzen, Tal & Gillian Gallagher. 2017. Rapid generalization in phonotactic learning. *Laboratory Phonology* 8(1). DOI: [10.5334/labphon.44](https://doi.org/10.5334/labphon.44).
- Liphola, Marcelino Marta. 2001. *Aspects of phonology and morphology of Shimakonde*. Columbus, Ohio: The Ohio State University. (Doctoral dissertation).
- Lunt, Horace. 1952. *A grammar of the Macedonian literary language*. Skopje: Macedonian State Press.
- Makanjila, Dominick. 2019. *The internal syntax of the Chimakonde determiner phrase*. Stellenbosch, South Africa: Stellenbosch University. (Doctoral dissertation).
- Manus, Sophie. 2003. *Morphologie et tonologie du simákòndè: parlé par les communautés d'origine mozambicaine de Zanzibar et de Tanga (Tanzanie)*. Paris: Institut national des langues et civilisations orientales (INALCO). (Doctoral dissertation).
- Manus, Sophie. 2010. The prosody of Simákonde relative clauses. *ZAS papers in Linguistics* 53. 159–185. DOI: [10.21248/zaspil.53.2010.397](https://doi.org/10.21248/zaspil.53.2010.397).
- McCloskey, James. 1996. On the scope of verb movement in Irish. *Natural Language & Linguistic Theory* 14. 47–104. DOI: [10.1007/bf00133403](https://doi.org/10.1007/bf00133403).
- Newell, Heather. 2008. *Aspects of the morphology and phonology of phases*. McGill University. (Doctoral dissertation).
- Odden, David. 1990. Tone in the Makonde dialects: Chimaraba. *Studies in African linguistics* 21(1). 62–99. DOI: [10.32473/sal.v21i1.107439](https://doi.org/10.32473/sal.v21i1.107439).
- Paster, Mary. 2006. *Phonological conditions on affixation*. Berkeley, CA: University of California, Berkeley. (Doctoral dissertation).
- Peperkamp, Sharon. 1997. *Prosodic words*. The Hague: Holland Academic Graphics.
- Rolle, Nicholas & Larry Hyman. 2019. Phrase-level prosodic smothering in Makonde. In Katherine Hout, Anna Mai, Adam McCollum, Sharon Rose & Matthew Zaslansky (eds.), *Supplemental proceedings of the Annual Meetings on Phonology*, vol. 5. Washington, DC: Linguistic Society of America. DOI: [10.3765/amp.v7i0.4458](https://doi.org/10.3765/amp.v7i0.4458).
- Rudin, Catherine, Christina Kramer, Loren Billings & Matthew Baerman. 1999. Macedonian and Bulgarian *li* questions: beyond syntax. *Natural Language & Linguistic Theory* 17(3). 541–586. DOI: [10.1023/a:1006223423256](https://doi.org/10.1023/a:1006223423256).
- Sande, Hannah, Peter Jenks & Sharon Inkelas. 2020. Cophonologies by ph(r)ase. *Natural Language & Linguistic Theory* 38(4). 1211–1261. DOI: [10.1007/s11049-019-09444-z](https://doi.org/10.1007/s11049-019-09444-z).

- Selkirk, Elisabeth. 1995. The prosodic structure of function words. In Jill Beckman, Laura Walsh Dickey & Suzanne Urbanczyk (eds.), *Papers in Optimality Theory*, 439–470. Also in *Signal to Syntax: Bootstrapping from Speech to Grammar in Early Acquisition*, eds. James L. Morgan and Katherine Demuth, 187–214. Amherst, MA: GLSA Publications.
- Selkirk, Elisabeth. 2011. The syntax-phonology interface. In John Goldsmith, Alan C.L. Yu & Jason Riggle (eds.), *Handbook of phonological theory* (Blackwell Handbooks in Linguistics Series), chap. 14, 435–484. Malden, MA: Wiley-Blackwell. DOI: [10.1002/9781444343069.ch14](https://doi.org/10.1002/9781444343069.ch14).
- Tomić, Olga Mišeska. 2001. The Macedonian negation operator and cliticization. *Natural Language & Linguistic Theory* 19(3). 647–682. DOI: [10.1023/a:1010775327330](https://doi.org/10.1023/a:1010775327330).
- Tomić, Olga Mišeska. 2012. *A grammar of Macedonian*. Bloomington: Slavica.
- Truckenbrodt, Hubert. 1999. On the relation between syntactic phrases and phonological phrases. *Linguistic Inquiry* 30(2). 219–255. DOI: [10.1162/002438999554048](https://doi.org/10.1162/002438999554048).
- Tyler, Matthew. 2019. Simplifying Match Word: evidence from English functional categories. *Glossa* 4(1). DOI: [10.5334/gjgl.631](https://doi.org/10.5334/gjgl.631).
- Werle, Adam. 2009. *Word, phrase, and clitic prosody in Bosnian, Serbian, and Croatian*. Amherst, MA: University of Massachusetts, Amherst. (Doctoral dissertation).
- Wolf, Matthew. 2008. *Optimal interleaving: serial phonology-morphology interaction in a constraint-based model*. Amherst, MA: University of Massachusetts, Amherst. (Doctoral dissertation).
- Yang, Charles. 2016. *The price of linguistic productivity: how children learn to break the rules of language*. Cambridge, MA: MIT Press.
- Yu, Alan C.L. 2003. *The morphology and phonology of infixation*. University of California, Berkeley. (Doctoral dissertation).
- Zanuttini, Raffaella. 2001. Sentential negation. In Mark Baltin & Chris Collins (eds.), *The handbook of contemporary syntactic theory*, 511–535. Malden, MA: Blackwell.
- Zec, Draga. 2005. Prosodic differences among function words. *Phonology* 22(1). 77–112. DOI: [10.1017/s0952675705000448](https://doi.org/10.1017/s0952675705000448).
- Zimmermann, Eva. 2023. Non-segmental morphology. In Peter Ackema, Sabrina Bendjaballah, Eulàlia Bonet & Antonio Fábregas (eds.), *Wiley Blackwell companion to morphology*. Malden, MA: Wiley Blackwell. DOI: [10.1002/9781119693604.morphcom054](https://doi.org/10.1002/9781119693604.morphcom054).

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Zimmermann, Eva. 2025. Cooperation at the morpho-phonology interface: an argument for phonological locality. In Nikolas Webster, Yağmur Kiper, Richard Wang & Sichen Larry Lyu (eds.), *Proceedings of the 41st West Coast Conference on Formal Linguistics*, 18–38. Somerville, MA: Cascadilla Proceedings Project.