Prosodic smothering in Macedonian and Kaqchikel*

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1 Introduction

PROSODIC SUBCATEGORIZATION: functional items may select for prosodic properties of the morphemes they co-occur with.

- Often formalized with lexical subcategorization frames (Inkelas 1990, Zec & Inkelas 1990, Klavans 1995, Chung 2003, Yu 2003, Zec 2005, etc.).

(1) English *in-* and *un-* (after Inkelas 1990, Raffelsiefen 1999)

a. Default adjective stress: antepenultimate
íntimate, *prímitive*, *dérelict*, *ásinine*,...

b. *ínfinite*, **ìnfínite* → [$_\omega$ *ín-finite*]

c. [$_\omega$ in- [...]]

d. *ùnfínished*, **únfinished* → [$_\omega$ *ùn-* [$_\omega$ *fínished*]]

e. [$_\omega$ un- [$_\omega$ ...]]

Less attention has been paid to the **vertical** dimension of prosodic subcategorization:

- Vertical subcategorization: the prosodic constituent *produced* by the attachment of a dependent morpheme to its host.
- In non-procedural terms: vertical subcategorization encodes the prosodic category that must **immediately dominate** the selecting morpheme.

(2) English *in-* and *un-* using vertical subcategorization[1]

in-	*un-*
[$_{\omega\text{-MIN}}$ in- [...]]	[$_{\omega\text{-NONMIN}}$ un- [...]]

- *in-* selects for domination by a *minimal* ω ⇒ unitary, 'flat' ω: [$_\omega$ *ín-finite*]
- *un-* selects for domination by a *non-minimal* ω ⇒ recursive ω: [$_\omega$ *ùn-* [$_\omega$ *fínished*]]

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[1]For more on the predicates '(non-)minimal' and '(non-)maximal' in the context of recursive prosodic structure, see Itô & Mester (2007, 2013), Elfner (2012) and references there.

2 Macedonian

2.1 The Macedonian clitic system

Macedonian is a South Slavic language with over 1.3 million speakers in the Republic of Macedonia and across the Balkans. Here, we focus on the **western Macedonian dialects**.

A system of object clitics is used to mark direct and indirect objects:

	Direct object	**Indirect object**
1s	me	mi
2s	te	ti
3s	go (non-fem) / ja (fem)	mu (non-fem) / ì (fem)
1p	nè	ni
2p	ve	vi
3p	gi	im
Reflexive	se	si

Table 1: Object clitics in Macedonian

Clitics are left-adjacent to tensed verbs (3) (capital letters mark stress).

(3) a. go VIde
3SM.ACC see.3S.PST
'(S)he saw him'

b. gi ZEde
3P.ACC take.3S.PST
'(S)he took them'

Phonology of object clitics:

- Strictly monosyllabic.
- Prosodically deficient: bare σs (no independent lexical stress / ω layer).

2.2 Stress assignment in the western Macedonian dialects

Stress is regularly antepenultimate (4a), or initial in monosyllabic and disyllabic words (4b,c)

(4) a. PROizvod 'product'
b. VOdi 'lead (3S.IMPF.PRES)'
c. LIK 'figure, image' (Tomić 2012)

Preverbal clitics do not generally affect stress placement.[2]

- Clitics that are (ante)penultimate in the clitic(s)+verb complex remain unstressed.

(5) *Clitic + bisyllabic verb*
a. mi go DAle 'They gave it to me.'
b. *mi GO dale (Rudin et al. 1999:553)

[2]The stress facts are different for post-predicate clitics; these are outside the scope of our analysis (see Lunt 1952:22-3, Rudin et al. 1999, Tomić 2012, Harizanov 2014 for more discussion).

Preverbal object clitics are therefore outside the stress domain containing the verb.
(for convenience, we assume the domain of stress is the minimal Prosodic Word ω-MIN)

(6) *Prosodic parse of object clitics*[3]

a. mi go [$_{\omega\text{-MIN}}$ DAle] (cf. (5))

b. CLITIC(S) [$_{\omega\text{-MIN}}$ VERB]

2.3 Exceptional clitic stress

There are two environments in which preverbal clitics systematically receive stress:

1. Sentential negation with the proclitic marker *ne*:

(7) a. [ne GO vide]
NEG ACC.3SM see.3S.PST
'(S)he didn't see <u>him</u>' (Lunt 1952)

b. [ne mu GI dava] [jaBOLkata]
NEG DAT.3SM ACC.3P give.3S apples.DEF
'(S)he is not giving him the apples' (Tomić 2012:66)

2. *Wh*-questions with *wh-* proclitics:

(8) a. [kako SE vikaš]
how REFL call.2S
'What's your name?' (Lunt 1952:23)

b. [koj mu GI dava] [jaBOLkata]
who DAT.3SM ACC.3P give.3S apples.DEF
'Who is giving him the apples?' (Tomić 2012:66)

The sentential negation marker *ne* and proclitic *wh*-words are in the same stress domain as the verb and any preverbal object clitics (Lunt 1952:23, Franks 1989:559, Rudin et al. 1999:557):

(9) a. [NE znam]
NEG know.1S
'I don't know'

b. [NE bi dal]
NEG AUX give.3S.PST
'(S)he should not have given.'

(10) a. [KOJ reče]
who.NOM say.3S.PST
'Who said it?'

b. [KOJ go zel]
who ACC.3S take.3S.PST
'Who took it?'

[3]Everything we say about the prosody of preverbal object clitics also holds for preverbal auxiliary clitics like *sum* 'am', which have the same prosodic behavior as preverbal object clitics (Franks & King 2000, Tomić 2012).

Descriptive conclusions:

- *Ne* and *wh-* clitics are in the same stress domain as the following verb:

  (11) [$_{\omega\text{-MIN}}$ *ne*/WH VERB] (cf. (9) and (10))

- Preverbal object clitics are outside the stress domain of the verb...

  (12) CLITIC(S) [$_{\omega\text{-MIN}}$ VERB] (cf. (5))

- ...unless *ne* or a *wh-* clitic is present:

  (13) [$_{\omega\text{-MIN}}$ *ne*/WH CLITIC(S) VERB] (cf. (7) and (8))

These patterns are **lexically idiosyncratic**:

- Clitic stress is conditioned by sentential negation and *wh*-words...
- ...but not by other functional elements (including other proclitics) in the clausal spine:

(14) Auxiliary/modal clitics do not trigger exceptional stress

a. k'e se [VENča]
will REFL marry.3S
'He will get married' (Lunt 1952:23)

b. *[k'e SE venča]

(15) Interrogative enclitic *li* does not trigger exceptional stress

a. [doNEsuvaš] li?
bring.2S Q
'Are you bringing (it)?' (Rudin et al. 1999:552)

b. *[doneSUvaš li]

2.4 Analysis: prosodic smothering

The lexical idiosyncracy of exceptional clitic stress implicates **prosodic subcategorization**.

(i) By default, preverbal clitics are outside the stress domain (ω-MIN) containing the verb (either by subcategorization or by the SYNTAX ⇒ PROSODY mapping algorithm).

(16) go [$_{\omega\text{-MIN}}$ VIde]
3SM.ACC see.3S.PST
'(S)he saw him'

(ii) The sentential negation marker *ne* and *wh-* clitics have **vertical subcategorization requirements**: they select for an immediately dominating minimal prosodic word.

(17) [$_{\omega\text{-MIN}}$ ne [...]] [$_{\omega\text{-MIN}}$ WH [...]][4]

Result 1: we understand why *ne* and *wh-* clitics are in the same stress domain as the verb.

- *Ne* and *wh-* clitics must be dominated by a ω-MIN which contains their host (17).
- This requirement forces *ne* and *wh-* clitics into the same stress domain (ω-MIN) as their hosts (the following verb).

(18) a. [KOJ reče]
b. [$_{\omega\text{-MIN}}$ WH VERB]

Result 2: we understand exceptional stress on preverbal object clitics.

- By default, preverbal object clitics are parsed outside of ω-MIN.

(19) a. go [VIde]
b. CLITIC [$_{\omega\text{-MIN}}$ VERB]

- But the default prosody in (19) is **inconsistent with the** SUBCAT **frames** for *ne* and *wh-* clitics!
  - Vertical subcategorization (17) requires immediate domination by ω-MIN.

(20) a. *ne go [VIde]
b. **ne* CLITIC [$_{\omega\text{-MIN}}$ VERB]

- Some prosodic adjustment must occur so that the SUBCAT frame (17) can be satisfied:
  - *Ne*/*wh-* must be directly dominated by ω-MIN.
  - Only possible if following object clitics are also parsed into ω-MIN.

(21) a. [ne GO vide]
b. [$_{\omega\text{-MIN}}$ *ne* CLITIC VERB]

This is **prosodic smothering**:

- In the presence of an outer functional item $\mathbb{F}$ (= *ne* or *wh-*)...
- ...some adjacent functional item A (= preverbal object clitic) is parsed into a lower prosodic domain than it would normally belong to.

Summary:

- Macedonian clitic stress seems to be non-local in character:
  - The prosody of the CLITIC(S)+VERB cluster depends on the presence/absence of an outer morpheme (*ne* or a *wh-* clitic).
- But the patterns in question can be reduced to conditioning by purely local prosodic subcategorization requirements holding over the vertical dimension.

[4]Though we use a single subcategorization frame to express the prosodic requirements of all *wh-* clitics, this is just shorthand for a set of subcategorization frames corresponding to each individual *wh*-element.

3 Kaqchikel

Kaqchikel is a K'ichean-branch Mayan language spoken by over half a million people in the central highlands of Guatemala (Richards 2003).

- Subjects and direct objects are indexed by agreement morphology on the verb/predicate.
- Ergative markers (ERG) index transitive subjects, as well as nominal possessors (22).

(22) Ergative marking in Kaqchikel

a. y-a-qa-q'etej
INCP-ABS.2S-ERG.1P-hug
'We hug you.'

b. qa-jolom
ERG.1P-head
'Our head.'

- Absolutive markers (ABS) cross-reference:
  - Transitive objects
  - Subjects of intransitives and aspectless non-verbal predicates (NVPs).

(23) Absolutive marking in Kaqchikel[5]

a. y-ix-ki-tz'ët
ASP-ABS.2P-E.3P-see
'They see y'all.'

b. x-ix-anin
ASP-ABS.2P-run
'Y'all ran.'

c. ïx tijonel-a'
ABS.2P teacher-PL
'Y'all are teachers.'

- Absolutive markers are written as:
  - Sub-parts of a complex word in verbal constructions (22a,b).
  - Independent words in NVP constructions (22c).
- But ABS is still a *dependent morpheme* in NPV contexts—it systematically fails tests for independent wordhood.
- For instance, ABS markers are strictly predicate-adjacent (24)-(25).

(24) a. e aq'omanel-a' k'a
ABS.3P doctor-PL then
'They're doctors, then.'

b. *e k'a aq'omanel-a'
ABS.3P then doctor-PL
'They're doctors, then.'

(25) a. yalan in jwi'
very ABS.1S smart
'I'm very smart'

b. *in yalan jwi'
ABS.1S very smart
'I'm very smart'

Claim: ABS agreement markers are PROSODIC CLITICS in NVP structures (where there is no aspect marking), and PROSODIC AFFIXES in verbs (where aspect marking is present).

[5]Kaqchikel examples are given in standard Mayan orthography. The orthography is largely phonemic, and most symbols have their IPA values. We use square brackets [X] when transcribing IPA symbols.

3.1 The prosodic variability of ABS

We assume a distinction between PROSODIC AFFIXES and PROSODIC CLITICS (e.g. Inkelas 1990, Selkirk 1995, Peperkamp 1997, Anderson 2005).

- **Prosodic affix**: ($_{\omega\text{-MIN}}$ M_d - HOST)
  A dependent morpheme M_d parsed into the minimal Prosodic Word containing its host.
- **Prosodic clitic**: { M_d = ($_{\omega\text{-MIN}}$ HOST) }
  A dependent morpheme M_d parsed outside the minimal Prosodic Word containing its host.

3.1.1 Phonological evidence for variable ABS prosody

Vowel-initial words bear an epenthetic glottal stop on the surface, /V…/ → [ʔV…] (García Matzar et al. 1999:12, Barrett 2007).

(26) a. jun [ʔ]oj
one avocado
'an avocado'

b. lajuj [ʔ]äk'
ten chicken
'ten chickens' (Majzul 2007:93,295)

- Phonological affixes bleed [ʔ]-insertion (27)-(28).

(27) a. [ʔ]ik' 'month'

b. aw-ik'
ERG.2S-month
'Your month.'

c. *a(w)-[ʔ]ik'

(28) a. /-el/ 'to leave'

b. [ʔ]el-e-b'äl
leave-V-LOC
'exit'

c. x-el
CPL-ABS.3S-leave
'(S)he left.'

d. *x-[ʔ]el

(Majzul 2007:166-7)

- [ʔ]-epenthesis is blocked by the affixation of ABS when functioning as verbal agreement.

(29) a. y-at-oq'
INCP-ABS.2S-cry
'You cry'

b. *y-a(t)-[ʔ]oq'

c. y-in-apon
INCP-ABS.1S-arrive
'I arrive.'

d. *y-i(n)-[ʔ]apon

  - ABS thus behaves like a **prosodic affix in verbal contexts**.

- But in NVP constructions, ABS co-occurs with an epenthetic [ʔ].

(30) a. at [ʔ]oj
A2S aguacate
'You are an avocado.'

b. *at oj

c. in [ʔ]umül
A1S rabbit
'I am a rabbit.'

d. *in umül

  - Expected if ABS is a **prosodic clitic in NVP contexts**.

Patterns of [ʔ]-insertion thus indicate that ABS has a dual prosodic status in Kaqchikel:

- A prosodic affix in verbal contexts: (ω-MIN ASP-ABS-(ERG)-VERB)
- A prosodic clitic when occurring with non-verbal predicates: { ABS=(ω-MIN PRED) }[6]

Convergent evidence for these structures (not discussed today) comes from:

- Patterns of phonologically-conditioned allomorphy.
- Sub-phonemic durational differences.

3.2 Analysis: prosodic smothering

Proposal: verbal aspect markers in Kaqchikel have vertical subcategorization requirements exactly like those for *ne/wh-* in Macedonian.

(31) ASP
[ω-MIN ASP [. . .]]

(32) a. [ω-MIN x- wär]
CPL sleep
'He/she/it slept.'

b. *[x- [ω-MIN wär]]

Default prosody for absolutive markers: prosodic clitics, outside ω-MIN defined by their hosts.

(33) a. in= [ω-MIN nïm]
ABS.1S big
'I'm big.

b. *[ω-MIN in-nïm]

When ASP and ABS co-occur, the prosodic subcategorization for ASP (32) clashes with the default prosody for ABS (33).

(34) a. *x- in= [ω-MIN wär]
CPL ABS.1S sleep
'I slept.'

b. *ASP-ABS=[ω-MIN V]

[6]See Dayley (1981:84,195) for similar suggestions regarding the closely-related language Tz'utujil.

- Resolved in favor of the subcategorization requirements for ASP (33) (as in Macedonian).
- Result: **prosodic smothering**.
  - ABS is compressed into ω-MIN to satisfy the selectional requirements of outer ASP.

(35) a. [$_{\omega\text{-MIN}}$ x- in- wär]
CPL ABS.1S sleep
'I slept.'

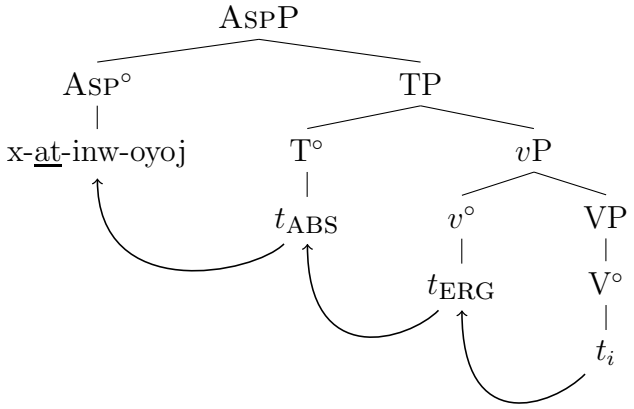
b. [$_{\omega\text{-MIN}}$ ASP-ABS-V]

3.3 Against a syntactic analysis

Our claim: the variable prosody of ABS is mediated by SUBCAT requirements for ASP which are not in play for aspectless non-verbal predicate constructions.

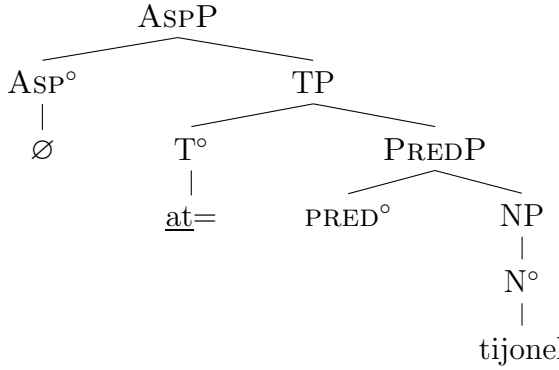
- Could the variable prosody of ABS instead reflect a variable *syntax* for NVPs vs. verbs?
- Perhaps ABS is part of a complex syntactic head in verbal contexts (36) ...

(36) ABS as a complex head in verbal *xatinwoyoj* 'I called you'.



- ... but part of a head-complement structure in non-verbal predicates (38).[7]

(37) ABS in a head-complement structure in non-verbal *at tijonel* 'You are a teacher'.



[7]For proposals along these lines see Baker (2003), Mateo Toledo (2008), Coon et al. (to appear), among others.

Assume a SYN ⇒ PHON mapping $X^0 \Rightarrow \omega$ (e.g. Selkirk 2011).

- Would derive the observed prosodic variation in ABS marking from the syntactic structures (36)-(37) without further stipulation.
- Central premise: syntactic integration necessarily entails prosodic integration.

These syntactic assumptions may be correct, but they aren't sufficient!

- Depends on a transparent mapping between syntactic and prosodic structure.
- But there's evidence for a double-dissociation of $X^0 \Leftrightarrow \omega$ correspondence (a conclusion also reached by Harley 2013 and Barrie & Mathieu to appear, among others).

Both within and outside of Kaqchikel we find complex syntactic heads that do not map to unitary prosodic words (see also Inkelas 1990, Poser 1990, Peperkamp 1997).

- Agentive prefixes: $X^0 \not\Rightarrow \omega$

  Agentive nominals formed with *aj-* have the phonology of clitic=host structures in Kaqchikel.

  (38) Initial [ʔ]-insertion with *aj-*

  a. aj=[ʔ]eyaj
  AGT=tooth
  'dentist'

  b. *aj-eyaj'

  But *aj-* nominals have the morpho-syntax of prefixed stems (Zwicky 1977, Zwicky & Pullum 1983, van Riemsdijk 1999, Anderson 2005, Nevins 2011).

  - Independent words may not intervene between *aj-* and its stem

  (39) a. ojer in aj=tz'ib'
  before ABS.1S AGT=letter
  'I used to be a secretary'

  b. *in aj=ojer tz'ib'
  ABS.1S AGT=before letter
  INTENDED:
  'I used to be a secretary'

  - *aj-* occurs with roots that are obligatorily bound stems.

  (40) a. -xikin 'ear'
  b. ajxikin 'listener'
  c. -chi' 'mouth'
  d. ajchi' 'chatty person'
  (Macario et al. 1998; Majzul 2007)

  - *aj-* can bear external inflectional morphology.

  (41) a. r-aj-to'-öl
  ERG.3S-AGT-help-NOM
  'her helper'

  b. r-aj-t'is
  ERG.3S-AGT-sew
  'her tailor'

  (Macario et al. 1998:10,367; Majzul 2007:66,69,78,129,247,543)

Conclusion: morpho-syntactic wordhood does not guarantee phonological wordhood.

- Purely lexical factors intercede in the determination of surface prosody.
- Reference to prosodic subcategorization cannot be obviated by reference to the syntax.

4 Discussion

- Vertical subcategorization can trigger apparently non-local prosodic restructuring.
  - Occurs when vertical SubCat requirements take precedence over default parsing.

(42) a. SubCat: $[_{\pi}\ \mathbb{F}\ [\ldots]]$

b. /A B/ $\rightarrow$ $[_{\delta}$ A $[_{\pi}$ B $]]$ ($\delta \geq \pi$ on the prosodic hierarchy)

c. /$\mathbb{F}$ A B/ $\rightarrow$ $[_{\pi}\ \mathbb{F}$ A B]

  - This is **prosodic smothering**.

- Prosodic smothering accounts neatly for contextual variation in the prosody of function morphemes in Macedonian and Kaqchikel.
  - These patterns cannot be reduced to morpho-syntactic differences across the relevant contexts.

Consequences:

- We firmly believe in the existence of general Syn $\Leftrightarrow$ Phon mapping principles.
- But lexical factors can radically distort the surface prosody derived by such mapping principles.
  - Another factor in the lack of isomorphism between syntactic and prosodic structure.
- We need to be very cautious about using prosodic differences as a diagnostic for underlying morpho-syntactic structure (especially at the level of the word and below).

Open questions:

- What is the overall typology of prosodic smothering?
  - Are there instances of prosodic smothering in other languages?
  - Are there familiar phenomena that can be re-analyzed as prosodic smothering?
- What is the meta-theory of vertical subcategorization?
  - What restrictions (if any) are there on vertical subcategorization?
  - Do SubCat requirements always take precedence over default parsing?
  - Are vertical SubCat requirements surface-true, or can they be violated (Kim 2010)?

- Comparison between morphological and phonological SubCat frames:
  - Violation of morphological subcategorization typically entails ineffability/absolute ungrammaticality ('clash and crash'; but cf. Green 2006:§3.3).
  - But violation of phonological subcategorization appears to trigger repairs ('clash and yield'; see Kiparsky 1994, Smolensky 1998 and Wolf & McCarthy 2005 for related discussion).

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