

Simplifying MATCH WORD: Evidence from English function words

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1 Introduction

- The prosodic structure of an expression resembles its syntactic structure, sort of.
- In particular, syntactic heads (e.g. N^0 , V^0 , A^0) tend to correspond to prosodic words (ω).
→ This is often codified in a **MATCH WORD** principle.

- But there’s usually a caveat... (emphases are mine)

(1) A sample of MATCH WORD principles and constraints:

- Weir (2012:111)
The edges of a **lexical** word [...] are mapped to the edges of a Prosodic Word (ω).
- Elfner (2012:241)
[A]ssign one violation for every **lexical** word in the syntactic component that does not stand in a correspondence relation with a prosodic word in the phonological component.
- Bennett et al. (2015:34)
Phonological words correspond to heads of syntactic phrases—**verbs, nouns, adjectives**, and so on, the basic building blocks of the syntactic system.

- I argue: we can remove the ‘lexical-only’ caveat.

(2) A simpler MATCH WORD principle
Prosodic words correspond to syntactic X^0 s.

- A complication comes from **function words**: they *don’t* typically correspond to prosodic words.
- Proposal: MATCH WORD can be **overruled** by other prosodic pressures.
- In particular, function words can have **idiosyncratic prosodic requirements**, and there is a strong pressure to satisfy them.
 - I implement this idea using **prosodic subcategorization frames** (Inkelas 1989; Inkelas and Zec 1995; Zec 2005; Bennett et al. to appear).

Roadmap:

2. The syntax-prosody interface
3. Proposal: prosodic subcategorization
4. Further support for prosodic subcategorization in English
5. Conclusions

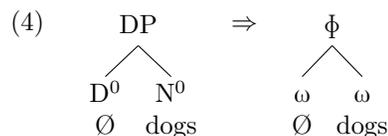
2 The syntax-prosody interface

My assumptions:

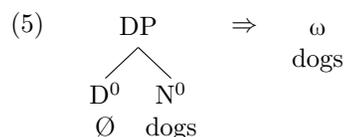
- Bare Phrase Structure (Chomsky 1995)
 - Not crucial, but it keeps the trees simple.
- Syntactic structure feeds prosodic structure-building:

$$(3) \quad \begin{array}{c} \text{XP} \\ \swarrow \quad \searrow \\ \text{X}^0 \quad \text{Y}^0 \end{array} \Rightarrow \begin{array}{c} \phi \text{ (= Phonological Phrase)} \\ \swarrow \quad \searrow \\ \omega \quad \omega \text{ (= Prosodic Word)} \end{array}$$

- Prosodic structure-building is a negotiation between:
 - ...being **faithful/isomorphic** to the input syntactic structure



- ...satisfying **independent well-formedness conditions** (e.g. “don’t have phonetically empty prosodic words”)



- This negotiation can be modelled in **Optimality Theory** (Prince and Smolensky 1993).¹

(6)

| | | |
|--|--------------------|-------|
| [_{DP} D ⁰ dogs] | NO-EMPTY- ω | FAITH |
| a. (ω dogs) | | * |
| b. (ϕ ($\omega\emptyset$)(ω dogs)) | * | |

So, what are these constraints enforcing syntax-prosody isomorphism?

2.1 Match Theory

Certain syntactic categories **match** certain prosodic categories (Selkirk 2009, 2011; Elfner 2012):²

¹This is the ‘indirect reference’ model of prosodic structure-building, where the relationship between syntax and prosody is mediated by some prosody-specific constraints. This is in contrast to ‘direct reference’ theories, where the prosody is built directly off the syntax (e.g. Wagner 2005, 2010).

²This hierarchy, which consists of only two distinct prosodic categories above the ω -level, was proposed by Ito and Mester (2009c, 2012, 2013) and assumed in much subsequent work.

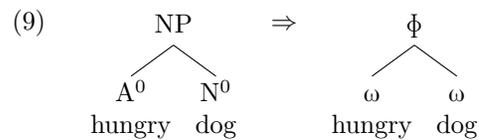
(7)

| Syntactic | Prosodic |
|----------------|----------|
| ForceP | ι |
| XP | ϕ |
| X ⁰ | ω |
| | F |
| | σ |

Three (classes of) **MATCH** constraints are generally assumed:³

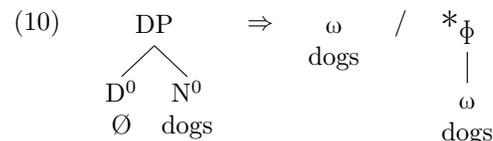
- (8)
- MATCH CLAUSE: Enforces CP \leftrightarrow ι correspondence
 - MATCH PHRASE: Enforces XP \leftrightarrow ϕ correspondence
 - MATCH WORD: Enforces X⁰ \leftrightarrow ω correspondence

An example:



- N.B. You might be wondering about single-word XPs (e.g. [_{DP} dogs]):

→ I assume a high-ranked **BINARITY(ϕ)** constraint that generally rules out unary-branching ϕ s:⁴



This seems all good for lexical X⁰s—but what about **functional X⁰s**?

³Many authors separate syntax>prosody (‘MAX’) and prosody>syntax (‘DEP’) mapping constraints. I don’t here, as every cliticizing English function word induces a violation of both types of constraint, and so separating out the two parts of the constraint would not affect the analysis. See Appendix A for details.

⁴For discussion of binarity constraints at the ϕ -level, see Inkelas and Zec (1995); Selkirk (2000); Ito and Mester (2009a); Elfner (2012); Bennett et al. (2016).

2.2 The problem of function words

- Function words are X^0 s, but they don't usually map to ω s (Selkirk 1996; Ito and Mester 2009a,b):

– They're unstressed (vowels are schwa), and so cannot be ω s:

(11) Mary talked [tə] Sue.

(12) John [əd] left.

- Ito and Mester (2009b,a) (based on a proposal in Selkirk 1996) argue that they are **bare syllables** (σ) that cliticize into an adjacent ω :^{5,6}

(13) a. ω
 \swarrow \searrow
 σ ω
to Sue

b. ω
 \swarrow \searrow
 σ ω
had left

So why don't function words map to ω s? Two kinds of explanation:

- MATCH WORD 'ignores' function words
- The influence of MATCH WORD is suppressed by a higher-ranked constraint

Explanation (a) is the consensus choice (emphases here are mine):

- (14) Lexical Category Condition⁷ (Truckenbrodt 1999)
Constraints relating syntactic and prosodic categories apply to lexical syntactic elements and their projections, but not to functional

⁵I only consider monosyllabic function words here. Ito and Mester (2009a) argue that disyllabic function words like *gonna* and even trisyllabic function words like *supposeta* also procliticize into recursive- ω s. I take a slightly different approach to longer function words here (see section 4.2.2 for a specific proposal on negated auxiliaries), and generally set the polysyllabic cases aside.

⁶Booij (1996) argues that Dutch proclitics behave in the same way.

elements and their projections, or to empty syntactic elements and their projections.

- (15) Discussion in Selkirk (2011)
*"...it's likely that lexical and functional phrasal projections—LexP and FncP—have to be distinguished... If **instead of a general Match XP this correspondence constraint were limited to lexical categories**, then, on the basis of the syntactic structure [_{VP} Verb [_{FncP} Fnc NP]], the Φ -domain structure (Φ Verb Fnc (Φ NP)) would be predicted..."*
- (16) Discussion in Elfner (2012:243)⁸
"...function words are not governed by MATCH-WORD, such that there is no impetus to parse them as prosodic words."

→ See also: Selkirk (1984, 1995, 2011); Selkirk and Shen (1990); Truckenbrodt (1999, 2007); Chung (2003); Werle (2009); Selkirk and Lee (2015).

I propose an alternative along the lines of explanation (b).

3 Proposal: prosodic subcategorization

- MATCH WORD does not discriminate between Fnc^0 and Lex^0 .
- MATCH WORD and MATCH PHRASE are outranked by a constraint **SUBCAT**:

(17) SUBCAT >> {MATCH WORD, MATCH PHRASE}

- SUBCAT enforces the **prosodic subcategorization frame** associated with particular lexical items.

⁷The Lexical Category Condition pertains to ALIGN constraints, which precipitated MATCH constraints, but the point is the same.

⁸It's interesting to note that, in contrast to work such as Truckenbrodt (1999) and Selkirk (2011), Elfner (2012) argues at length that functional *phrases* (especially small clauses) are preferentially mapped to Φ s. For her, it's only functional *heads* that are ignored by syntax-prosody mapping constraints.

In this section:

- Deriving the basic prosodic behavior of some function words.
- Two nice consequences of this approach.

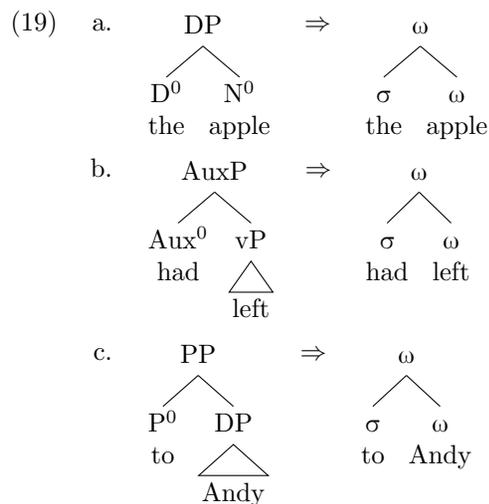
3.1 Prepositions, auxiliaries and determiners

The frame for most P⁰s, Aux⁰s and D⁰s:⁹

$$(18) \quad [{}_{\omega} \text{ Fnc}^0 [\dots]]$$

(i.e. “Fnc⁰ must be immediately dominated by a branching ω , and Fnc⁰ must constitute the left branch.”)

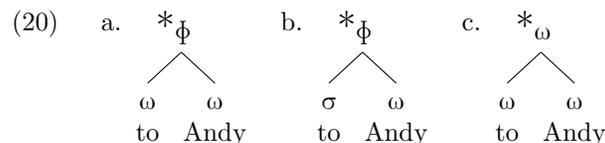
This mapping forces cliticization into ω :¹⁰



⁹Note that this is a *vertical* subcategorization frame, in that a particular form selects for the category of its mother. This device is less commonly employed than *horizontal* subcategorization, where a form selects for the category of its sister—see Bennett et al. (to appear) for discussion. Most of the analysis does not hinge on the use of vertical subcategorization, although the account of how auxiliaries interact with clitic negation *-n’t* does require vertical subcategorization—see section 4.2.2.

¹⁰Note that these auxiliaries are not *fully* reduced, in that they still have a vowel. Anderson (2008) shows that when English auxiliaries are reduced to simply being consonants, the best analysis is that they cliticize *leftward*.

...and we *don’t* see the following, even though they are all a ‘better fit’ for the syntactic structure:



They all violate SUBCAT and are doomed:¹¹

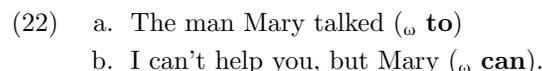
(21)

| [_{PP} to [_{DP} Andy]] | SUBCAT | MW | MP |
|--|--------|----|----|
| a. (ϕ (ω to)(ω Andy)) | *! | | |
| b. (ϕ to (ω Andy)) | *! | * | |
| c. (ω (ω to)(ω Andy)) | *! | * | * |
| \Rightarrow d. (ω to (ω Andy)) | | ** | * |

This approach leads to two nice consequences:

3.2 Consequence #1: strong ‘stranded’ functions words

- In certain configurations, function words *do* map to prosodic words (Selkirk 1996):



- When does this happen? **When there is no way to satisfy SUBCAT.**

(23)

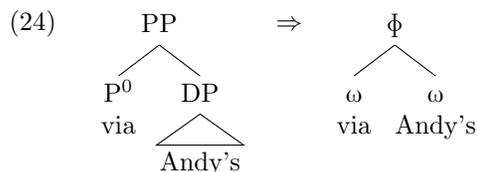
| [_{VP} talked [_{PP} to <i>t</i>]] | SUBCAT | MW | MP |
|---|--------|-----|----|
| \Rightarrow a. (ϕ (ω talked)(ω to)) | * | | |
| b. (ϕ (ω talked) to) | * | *! | |
| c. (ω (ω talked)(ω to)) | * | *! | * |
| d. (ω (ω talked) to) | * | *!* | * |

¹¹Note that not all MATCH PHRASE violations are shown. Clearly all the candidates violate it at least once by failing to map the DP/NP *Andy* to a ϕ . When every candidate induces the same violation, I generally do not show the shared violation mark in the tableau to reduce clutter (though of course (23) is an exception).

→ When it's impossible to satisfy SUBCAT, function words are integrated into the prosodic structure just like any other X^0 .¹²

3.3 Consequence #2: function words without subcategorization frames

- Not all function words procliticize into a neighboring ω .
- Some are *always* their own ω s, e.g. determiner *that*, some 'fancy' prepositions (*via*, *qua*).¹³



– N.B. See Appendix B for evidence that this is the right structure

- Explanation: **these function words lack a subcategorization frame.**

¹²There's a complication: sometimes there is phonological material after the preposition/auxiliary, but it's forced to go unreduced anyway:

- (i) Who were you talking (ω to) yesterday?

Selkirk (1996) explains this by saying that function words cannot procliticize across the right edges of phonological phrases, which (without exception) coincide with the right edge of syntactic phrase boundaries. But in this model (based on Ito and Mester 2009a,b), single-word PPs map to ω s rather than ϕ s, and so this constraint would not be relevant.

Perhaps a family of theories in Kahnemuyipour (2003); Kratzer and Selkirk (2007); Elfner (2012) and others provides a way out. In these theories, prosodic structure-building, like syntactic structure-building, proceeds in *spell-out domains* or *phases* (Chomsky 2000, 2001), of which there are (at least) two per clause. The intuition is that the prosodic structure that corresponds to each phase is 'locked in' and cannot be further internally manipulated, but can only be embedded inside more prosodic structure. If adverbs like those in (ii) were merged at a higher phase than the stranded prepositions, we might be able to explain the absence of procliticization.

¹³To my knowledge it has not previously been claimed that determiner *that* occupies a ω unto itself. However, the phonetic results reported in Brown-Schmidt et al. (2005), who show that the vowel in unstressed *that* is on average 88ms longer than the vowel in unstressed *it* seem to support this claim, as does the fact that its vowel cannot be reduced to schwa, unlike complementizer *that*.

- Therefore they get treated like regular lexical categories (which also lack subcategorization frames):

(25)

| | [PP via [DP Andy's]] | SUBCAT | MW | MP |
|------|--|--------|-----|----|
| ☞ a. | (ϕ (ω via)(ω Andy's)) | | | |
| b. | (ϕ via (ω Andy's)) | | *! | |
| c. | (ω (ω via) (ω Andy's)) | | *! | * |
| d. | (ω via (ω Andy's)) | | *!* | * |

In summary:

- Function words are prosodically reduced because they are satisfying their **subcategorization frames**.
- Sometimes a subcategorization frame can't be satisfied: in those cases, function words are treated like any other X^0
 - cf. stranded prepositions/auxiliaries
- Some function words don't have subcategorization frames, and are also treated like any other X^0 .
 - cf. *via*

But: how is this better than other analyses that capture the same facts? E.g. Selkirk (1996).

- Answer: because it exploits machinery (prosodic subcategorization) that is **independently necessary**.
 - If we need this machinery already, we don't need to carve out a special caveat ('lexical X^0 s only') for MATCH WORD.
- Next: further support for English function words having prosodic subcategorization frames.

4 Further support for prosodic subcategorization in English

In a world **without** subcategorization frames, we would expect that:

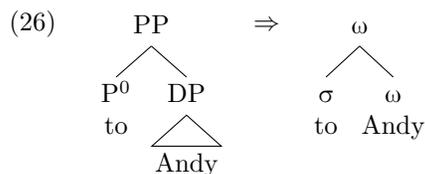
- a. Function words are integrated into prosodic structure in **whatever way is least marked**.
→ i.e. non-isomorphism is as limited as possible.
- b. All function words are integrated into syntactic structure **in the same way**.
→ i.e. no special treatment for different classes of function word.

Both points are challenged here:

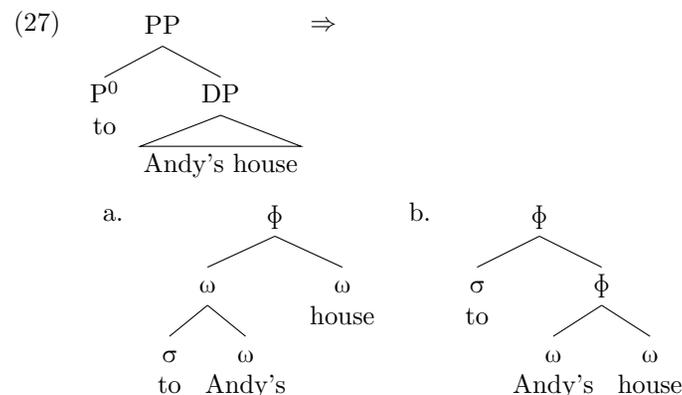
- a. Prepositions and auxiliaries can induce **very non-isomorphic** prosodic structures.
- b. There are differences among function words. Prepositions and auxiliaries only cliticize **rightwards**; object pronouns and clitic negation *-n't* only cliticize **leftwards**.

4.1 Prepositions and auxiliaries force non-isomorphic structures

- A preposition with a single- ω complement:



- But what happens when P^0 takes a multi- ω complement?



- (27b) is **more isomorphic** to the syntax. If MATCH WORD simply ignores functional categories, this is what we'd expect.
- Which do we actually get? **(27a)!**
→ See Ito and Mester (2009a) and Appendix C for support.
- Why do we get the **less isomorphic** structure? It's the one that satisfies SUBCAT:¹⁴

(28)

| [PP to [DP Andy's house]] | SUBCAT | MW | MP |
|---|--------|----|----|
| a. (ϕ (ω to (ω Andy's))(ω house)) | | * | * |
| b. (ϕ to (ϕ (ω Andy's)(ω house)) | *! | | |

Therefore: lexical information is indispensable in prosodic structure-building

- N.B. You might wonder if this particular effect of SUBCAT could be achieved with EXHAUSTIVITY (Selkirk 1996) or STRONG START (Selkirk 2011). See Appendix D for arguments that neither of these constraints could be responsible.

¹⁴I follow Elfner (2012) in assuming that the phrasal projections of functional categories ('FncP's) are preferentially mapped to ϕ s too. Therefore candidate (b) receives one fewer MATCH PHRASE violations than candidate (a)—candidate (b) has a ϕ which corresponds to DP, while candidate (a) lacks this ϕ .

In summary:

- Function words can **distort** prosodic structure, making it less isomorphic to syntactic structure.
- It's unclear why this would happen if MATCH WORD simply ignores function words, meaning they should be integrated into prosodic structure in the 'least marked' way.

Up next: Differences in the prosodic subcategorization frames of English function words.

4.2 Object pronouns and *-n't* cliticize leftwards

- Different function words, within one language, can have different prosodic behaviors:

→ E.g. Serbian (Zec 2005):

- (29) 'Free' Fnc: cliticizes into adjacent ϕ ¹⁵
 ⇒ 2nd-position clitic *smo* blocked

***Mi** [_ωplavu]=*smo* kuću već videli.
we blue=AUX.CL house already saw

- (30) 'Bound' Fnc: cliticizes into adjacent ω
 ⇒ 2nd-position clitic *smo* **not** blocked

[_ω**O**=plavu]=*smo* kuću već videli.
about.CL=blue=AUX.CL house already heard
 'We have already heard about the blue house.'

– See also: Nespov and Vogel (1986); Chung (2003); Bennett et al. (to appear) a.o.

¹⁵This is a simplification. Zec shows that free function words cliticize into an adjacent ϕ when monosyllabic, but become their own ω when disyllabic. Bound Fnc words on the other hand always cliticize into the adjacent ω , regardless of their size.

- Two subcategorization frames for English function words:

- (31) a. Prepositions, auxiliaries, determiners...
 [_ω Fnc⁰ [...]]
 b. Object pronouns, *-n't*
 [_ω [...] Fnc⁰]

- Let's consider the frame in (31b)...

4.2.1 Object pronouns

- Selkirk (1996): object pronouns cliticize into the ω on their left:

- (32)
$$\begin{array}{ccc} \text{VP} & \Rightarrow & \omega \\ \swarrow \quad \searrow & & \swarrow \quad \searrow \\ \text{V}^0 \quad \text{D}^0 & & \omega \quad \sigma \\ \text{need} \quad \text{'em} & & \text{need} \quad \text{'em} \end{array}$$

- Explanation: object pronouns have the subcategorization frame: [_ω [...] Fnc⁰]
- Like prepositions and auxiliaries, object pronouns cannot be reduced when prosodically 'stranded':

- (33) Stranded prepositions/auxiliaries
 a. The man Mary talked (_ω **to**).
 b. I can't help you, but Mary (_ω **can**).

- (34) 'Stranded' object pronouns
 a. (_ω **Him**) talking to me at all was a surprise.
 b. It's nice, (_ω **them**) all together at last.

- In (33-34), **the function word is unable to satisfy its subcategorization frame.**

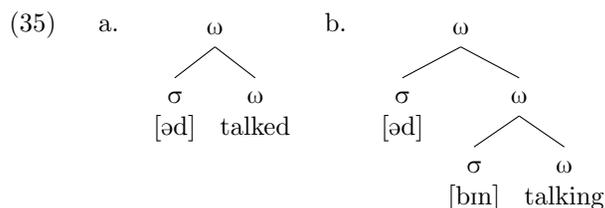
→ Therefore MATCH WORD steps in, makes it a ω .

- N.B. I believe this account works better than that in Selkirk (1996). She proposes that object pronouns, exceptionally, cliticize leftwards because they undergo **incorporation** in the syntax.

4.2.2 *-n't*

- Claim: *-n't* also has the left-cliticizing subcategorization frame $[\omega [\dots] \text{Fnc}^0]$
 → This will explain a surprising interaction with right-cliticizing auxiliaries.

- Auxiliaries cliticize rightwards, recursively (Selkirk 1996):



- Crucial observation: *-n't* forces its auxiliary to be unreduced.

(36) a. Bill [ˈhædn̩t] left.
 b. *Bill [əd̩n̩t] left.

(37) a. Mary [kænt] answer.
 b. *Mary [kənt] answer.

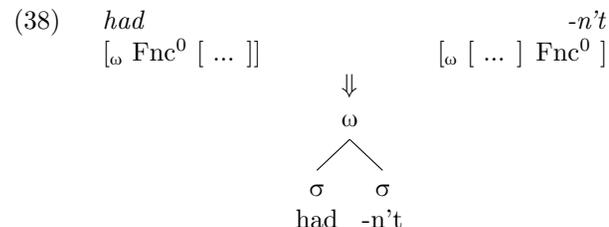
- Explanation: grouping Aux⁰ and *-n't* in a ω **simultaneously satisfies two subcategorization frames**.¹⁶

¹⁶The general applicability of this idea remains to be seen. Chung (2003) argues that in Chamorro, enclitic weak pronouns cannot bear proclitic case-markers because there is no prosodic structure that satisfies a ‘proclitic-enclitic’ sequence.

However, looking at Serbian, there are several free function words, which are usually prosodically reduced, which head full prosodic words when they have a clitic attached (Zec 2005):

(i) $[\omega \text{ M}\hat{\text{i}}=\text{smo}]$ plavu kuću već videli.
 $\text{we}=\text{AUX.CL}$ blue house already saw
 ‘We already saw the blue house.’

Even more intriguingly, there are certain ‘[bound proclitic]-[bound enclitic]’ sequences which can also become fully-fledged prosodic words:



In summary:

- English function words are pre-specified to cliticize leftward or rightward.
- This would be unexpected if we were living in a world where the prosody treats all function words alike.
 - E.g. a ‘MATCH WORD ignores function words’ kind of world.
- When there is no prospect of satisfying SUBCAT, object pronouns behave like auxiliaries and prepositions: they ‘default’ to a ω .
 - Implying that there is a shared rule or constraint (e.g. MATCH WORD) governing their prosodic behavior, **in addition to** their different subcategorization frames

(ii) Zvonili= smo $[\omega \text{ ali}=\text{nam}]$ niko nije otvorio.
 $\text{rang}=\text{AUX}$ **but}=\text{us.CL}** noone not open
 ‘We rang, but noone opened the door for us.’

A typology of what can and does happen when proclitics abut enclitics would be an interesting avenue for future research.

5 Conclusions

- To fully capture the prosodic behavior of function words, we need both:
 - Idiosyncratic prosodic information projected from the lexicon—here, I’ve used (vertical) prosodic subcategorization frames.
 - A MATCH WORD principle, for when satisfying the subcategorization frame isn’t an option.
- An Optimality-Theoretic syntax-prosody interface lets us capture this interaction.
- MATCH WORD should not be restricted to lexical X⁰s.

Further issues:

- Extension of the proposal to account for the prosodic requirements of comparative *-er*/superlative *-est*? (They require single-foot stems).
- It seems that whole *classes* of function words are associated with subcategorization frames (e.g. all object pronouns do one thing, all auxiliaries do another), not necessarily individual function words.
 - Is this a consequence of their historical development, or does it tell us something about how the lexicon is structured?
- If the analysis is correct, phonological reduction is *not* inherently associated with being a functional item.
 - Raising the question: why don’t we see frequent **lexical** items similarly undergoing reduction?
 - Maybe the ω>clitic cline either tracks or follows, but never precedes, the lexical>functional cline.
 - For example, most (all?) examples of cliticizing verbs are auxiliaries or light verbs (e.g. Chung 2003 on Chamorro, Seiss 2009 on Ngan’gityemerri).

Acknowledgements

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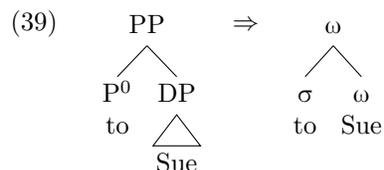
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Appendix A: Separating out MATCH(X^0, ω) and MATCH(ω, X^0)

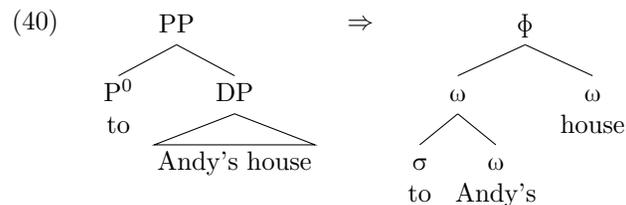
Here, we will see that separating out the constraints into syntax→prosody and prosody→syntax sub-constraints has no impact on the analysis.

In building the prosodic structure of a FncP with a single- ω complement, both constraints are violated:



- There is one phonetically contentful X^0 with no corresponding ω ('to') and one ω with no corresponding X^0 ('to Sue').

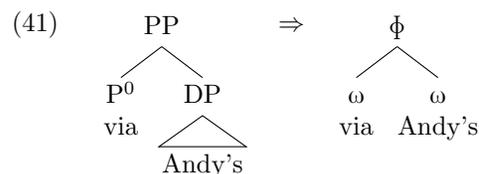
The same happens when a function word takes a multi- ω complement:



- There is still one phonetically contentful X^0 with no corresponding ω ('to') and one ω with no corresponding X^0 ('to Andy's').

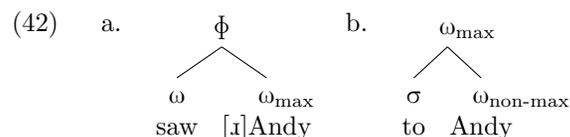
Appendix B: 'Fancy' prepositions map to ω s

In section (3.3) I stated that *via* and its ilk form full ω s:

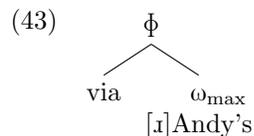


And how do we know that this is the right structure? We can use some deductive reasoning.

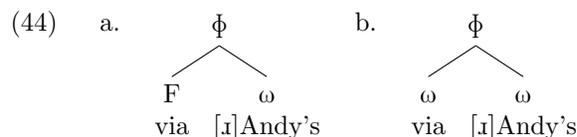
- Ito and Mester (2009b, following McCarthy 1993): in non-rhotic English, intrusive /r/ is epenthesized in the onset of a maximal ω , but *not* in the onset of a non-maximal ω :



Intrusive /r/ is epenthesized after *via*, meaning that the complement of *via* **must** be a maximal ω :



This leaves these possible structures:

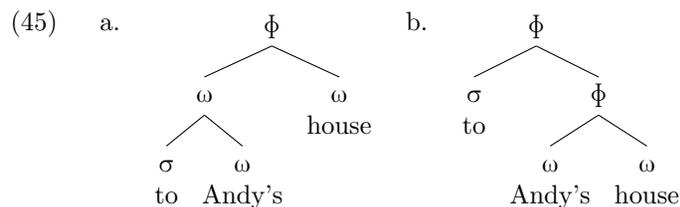


Here the data underdetermines the analysis: I go with (44b) because there is no reason to think that *via* would *not* occupy a ω (which seems like the less marked option), but it's true that I haven't properly ruled out the alternative.

Note that Ito and Mester (2009a) argue that disyllabic prepositions and auxiliaries (e.g. *under*, *gonna*) are 'bare' feet that adjoin at the ω level, e.g. (ω (F gonna) (ω eat)). However, *via* does not fall into this class, because *gonna* does not trigger linking-/r/ in its complement (**gonna* [ɪ]eat), while *via* does.

Appendix C: the prosodic structure of PPs/AuxPs consisting of multiple ω s

Which of the following is the correct structure?



Diagnostic: in non-rhotic English, intrusive /r/ is epenthesized in the onset of a maximal ω , but *not* in the onset of a non-maximal ω (Ito and Mester

2009b).

Test results: intrusive /r/ is **not** found when a P^0/Aux^0 takes a multi- ω complement.

- (46) a. t[ə] Andy's house
 b. *t[ə] [ɪ]Andy's house

- (47) a. gonn[ə] eat cake
 b. *gonn[ə] [ɪ]eat cake

Therefore (45a) is the correct structure.

Appendix D: Against EXHAUSTIVITY and STRONG START as alternative explanations for the effects of SUBCAT

I argued: a high-ranked SUBCAT explains why prepositions force a particular non-isomorphic syntactic structure when they take multi- ω complements.

(48)

| [_{PP} to [_{DP} Andy's house]] | SUBCAT | MW | MP |
|---|--------|----|----|
| ☞ a. (ϕ (ω to (ω Andy's))(ω house)) | | * | * |
| b. (ϕ to (ϕ (ω Andy's))(ω house))) | * | | |

You say: "Hang on, why not EXHAUSTIVITY (Selkirk 1996) or STRONG START (Selkirk 2011)?"

Against EXHAUSTIVITY

- EXHAUSTIVITY militates against 'level-skipping' in the prosodic hierarchy.
 - So if ϕ immediately dominates σ , that's a violation.
- It works just as well as SUBCAT here:

(49)

| [PP to [DP Andy's house]] | EXH | MW | MP |
|---|-----|----|----|
| ☞ a. (ϕ (ω to (ω Andy's))(ω house)) | | * | * |
| b. (ϕ to (ϕ (ω Andy's)(ω house))) | * | | |

- But it breaks when embedded in a larger structure. See how EXHAUSTIVITY doesn't force the preposition to right-adjoin:

(50)

| [TP [DP John] has [VP left [DP home]]] | EXH | MW | MP |
|---|-----|----|----|
| ☞ a. (ϕ (ω John)(ϕ (ω has (ω left))(ω home))) | | * | * |
| ☞ b. (ϕ (ω (ω John) has)(ϕ (ω left)(ω home))) | | * | * |
| c. (ϕ (ω John)(ϕ has (ϕ (ω left)(ω home)))) | * | | |

- Of course, it's always possible a different constraint could break the tie, but that's all I have for now.

Against STRONG START

- STRONG START (Selkirk 2011) punishes ϕ s whose first constituent is not a ϕ or a ω . It essentially works like EXHAUSTIVITY, but relativized to the left edge of a ϕ .
- Again, it does just as well as SUBCAT for the basic case:

(51)

| [PP to [DP Andy's house]] | SS | MW | MP |
|---|----|----|----|
| ☞ a. (ϕ (ω to (ω Andy's))(ω house)) | | * | * |
| b. (ϕ to (ϕ (ω Andy's)(ω house))) | * | | |

- But again, it has nothing to say about what happens when this PP is embedded inside a larger structure:

(52)

| [TP [DP John] has [VP left [DP home]]] | SS | MW | MP |
|---|----|----|----|
| ☞ a. (ϕ (ω John)(ϕ (ω has (ω left))(ω home))) | | * | * |
| ☞ b. (ϕ (ω (ω John) has)(ϕ (ω left)(ω home))) | | * | * |
| c. (ϕ (ω John)(ϕ has (ϕ (ω left)(ω home)))) | * | | |