An apparent syntax-prosody mismatch as right extraposition: Evidence from Mayan*

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1. Introduction

Many approaches to the syntax-prosody interface assume that prosody only roughly maps to surface syntax (e.g. Selkirk 1984, 1986; Nespor and Vogel 1986, a.o.). When syntax and prosody fail to correspond, such accounts generally posit that there can be systematic *mismatches* between the two components of grammar. The goal of this paper is to zoom in on a particular phenomenon, extant across many Mayan languages, which has been argued to involve a mismatch. Based on data from Chuj and K'iche',[1] I show that a different account of the same phenomenon that does away with mismatches is not only possible, but guides us to a better understanding of the syntax. In doing so, the proposal aligns with accounts that take apparent instances of mismatches as evidence that the syntactic analysis must be revisited, such as Steedman 1991, Wagner 2010, and Hirsch and Wagner 2015.

2. Puzzle: prosodic allomorphy in Chuj and K'iche'

Many Mayan languages feature morphemes sensitive to prosodic boundaries. I refer to this phenomenon as "prosodic allomorphy" (see e.g. Craig 1977, Aissen 1992, Henderson 2012, Can Pixabaj 2015). One example is the "status suffixes" (SS), which appear at the end of verb stems and encode information about transitivity, aspect, and mood (Aissen et al.

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[1] Chuj is a Q'anjob'alan language spoken by 70,000 speakers in Guatemala and Mexico. All Chuj data come from original elicitation in Guatemala, Mexico, and Canada. K'iche' is a K'ich'ean language spoken in Guatemala by roughly 900,000 speakers (Can Pixabaj 2015). The K'iche' data come from previous work by other authors (mainly Henderson and Can Pixabaj) and from questionnaires with two speakers.

2017). For instance, the intransitive status suffixes *-i* in Chuj and *-ik* in K'iche' surface when the verb is sentence final, but not when it is followed by an adverb or nominal argument:[2]

(1) CHUJ

a. Ix-in-wa'-[i / *Ø].
PFV-B1S-eat-SS
'I ate.'

b. Ix-in-wa'-[*i / Ø] k'ojank'olal.
PFV-B1S-eat-SS slowly
'I ate slowly.'

c. Ix-wa'-[*i / Ø] ix Malin.
PFV-eat-SS CLF Malin
'Malin ate.'

(2) K'ICHE'

a. X-e'-ul-[ik / *Ø].
PFV-B3P-arrive-SS
'They arrived.'

b. X-e'-ul-[*ik / Ø] aninaq.
PFV-B3P-arrive-SS quickly
'They arrived quickly.'

c. X-ul-[*ik / Ø] le alah.
PFV-arrive-SS the boy
'The boy arrived.'

In the rest of this paper, I refer to suffixes like *-i* and *-ik* as "long allomorphs", and to their shorter allomorph (sometimes null, as above) as "short allomorphs" (shortly, we will see one case where the short allomorph is also overt).

Given the data in (1) and (2), we might think that long allomorphs only surface at the end of sentences. However, this cannot be the whole story, since long allomorphs are obligatory in some non-sentence-final positions, as shown in the Chuj example below:

(3) Ix-w-il-[a' / *Ø] [to ix-ach-xit' ek'-i].
PFV-A1S-see-SS COMP PFV-B2S-go DIR.pass-SS
'I saw that you went.' (Chuj)

In (3), the transitive status suffix *-V'* (a partially harmonic vowel) obligatorily appears when the verb is positioned immediately before a complement clause. Equivalent K'iche' examples can be found in Henderson 2012, page 748.

The research question that emerges is the following: What are the conditioning factors responsible for the presence (or absence) of long allomorphs? In the next section, we look at one possible answer to this question, put forward in Henderson 2012.

3. Henderson 2012: An account of prosodic allomorphy with mismatches

Henderson (2012), focusing specifically on K'iche', offers an edge-based account (modelled in Optimality Theory) of the distribution of long allomorphs, summarized in (4).

(4) a. Long allomorphs appear at the end of intonational phrases (*ι*-phrases).
b. *ι*-phrases align with the left and right edges of CPs.

[2]Abbreviations: A: ergative/possessive; AF: agent focus; B: absolutive; CLF: noun classifier; COMP: complementizer; DIR: directional; INDF: indefinite; IPFV: imperfective; M: masculine; PRON: pronoun; SS: status suffix; PFV: perfective; TOP: topic.

Long allomorphs are governed by phonology (4a): they are required to appear last within a certain prosodic domain—the ι-phrase. Prosodic domains are in turn determined via the syntax-prosody mapping algorithm in (4b). The relevant prosodic phrase here is the ι-phrase, which Henderson argues roughly aligns with CP boundaries.

As Henderson shows, (4) derives the vast majority of occurrences of long allomorphs without having to posit exceptions in the mapping algorithm. For example, long allomorphs are predicted to appear in sentence-final position, which will always correspond to the right edge of a CP in the syntax (5a), and so to the right edge of an ι-phrase in the prosody (5b):

(5) a. [$_{CP}$ X-in-kos-ik / *Ø].
PFV-B1S-tire-SS
'I'm tired.' (K'iche', Henderson 2012, (5a))

b. (x-in-kos-**ik**)$_{ι\text{-phrase}}$

Henderson's proposal also predicts the presence of long allomorphs before complement clauses. With complement clauses, however, it becomes crucial to be able to make reference to the *left* edge of the CP. Henderson assumes that prosodic phrasing is non-recursive (see also Selkirk 1986 a.o.), and so the presence of an ι-phrase boundary at the left edge of an embedded CP will also correspond to the right edge of a preceding ι-phrase. A K'iche' example is provided in (6) for illustration (prosodic boundaries are indicated with "‖").

(6) a. [$_{CP}$ X-inw-il-o / *Ø [$_{CP}$ chi x-e'-el-**ik**]].
PFV-A1S-see-SS COMP PFV-B3P-go-SS
'I saw that they went.' (K'iche', Henderson 2012, (60))

b. (X-inw-il-**o**)$_{ι\text{-phrase}}$ ‖ (chi x-e'-el-**ik**)$_{ι\text{-phrase}}$

Though the rules in (4) capture most patterns straightforwardly, Henderson nevertheless argues that imperfections in the correspondence between syntax and prosody are inevitable. Specifically, while the mapping algorithm in (4b) predicts that the syntax in (7a) should always map to a prosody like (7b), there are times where what actually obtains is (7c).

(7) a. [$_{CP}$ X Y [$_{CP}$ Z]] (syntax)

b. (X Y)$_{ι\text{-phrase}}$ ‖ (Z)$_{ι\text{-phrase}}$ (predicted prosody)

c. (X)$_{ι\text{-phrase}}$ ‖ (Y Z)$_{ι\text{-phrase}}$ (actual prosody)

This type of mismatch is argued to arise specifically with *because*-clauses, which Henderson proposes are headed by prepositional phrases (see §5.2) and adjoin to VP:

(8) [X-in-kos-ik / *Ø [$_{PP}$ *r-umal* [$_{CP}$ x-in-chakun-ik]]].
PFV-B1S-tire-SS A3S-because PFV-B1S-work-SS
'I'm tired because I worked.' (K'iche', Henderson 2012, (41a))

Since the word *rumal* in (8) is a preposition that selects for a CP, we expect there to be an ι-phrase boundary after it, but instead we find an ι-phrase boundary *before* it:

(9) a. (. . . -Ø *rumal*)$_{\iota\text{-phrase}}$ || (. . .)$_{\iota\text{-phrase}}$ (predicted prosody)
b. (. . . -ik)$_{\iota\text{-phrase}}$ || (*rumal* . . .)$_{\iota\text{-phrase}}$ (actual prosody)

Henderson proposes to derive these facts via constraint ranking, summarized in greater detail in section 5.2. But for now, the crucial point is that this leads to a complex relationship between ι-phrases and CP edges, where mismatches are tolerated.

In the next sections, I propose an alternative analysis of prosodic allomorphy, by showing empirical support that the clauses that create the apparent mismatches exhibit a different syntax than the one assumed in Henderson 2012. Specifically, I show that clausal adjuncts and CP complements are higher in the syntax than previously thought. I also propose a simplified syntax-prosody mapping algorithm, which derives ι-phrase boundaries by only making reference to the right edge of CPs (and which stays neutral with respect to recursion in prosodic phrasing).

4. Topics and correlates of prosodic allomorphy

Before turning to the alternative account, I show an additional environment where long allomorphs arise: after topics. We will also see that long allomorphs correlate with high boundary tones, which following Henderson, I take to mark the edge of ι-phrases.

In section 2, we saw that status suffixes in both Chuj and K'iche' alternate with null allomorphs. However, both languages feature *overt* short allomorphs. For example, the noun classifier *ni('o')*, used as a third person masculine pronoun, exhibits allomorphy in the same environments as the status suffixes (see Buenrostro et al. 1989 and Royer 2019).[3] It appears sentence finally (10a), when immediately followed by a complement clause (10b), but not when followed by a DP complement (10c):

(10) a. Ix-w-il ni'o' / *ni .
PFV-A1S-see PRON.M
'I saw him.'
b. Ix-y-al ni'o' / *ni [$_{CP}$ to ix-in-b'at-i].
PFV-A3-say PRON.M COMP PFV-B1S-go-SS
'He said that I went.'
c. Ix-s-chel ni / *ni'o' [$_{DP}$ winh winak].
PFV-A3-hug PRON.M CLF man
'The man hugged him.'

Though prosodic allomorphy spans over several unrelated morphemes in each language (see Can Pixabaj 2015, Table 4.2 for full list in K'iche'), it is governed by the same factors, and for reasons of space, I only show examples with *ni('o')* in the rest of this paper.

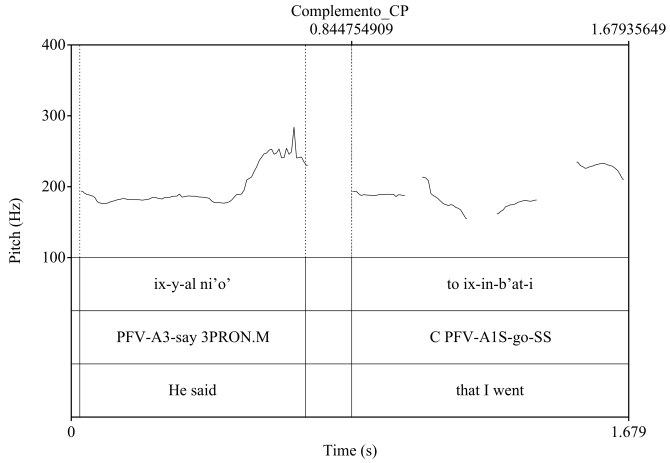
[3]The classifier *ni/ni'o* is only found in the Nentón variant of Chuj.

It is important to mention at this juncture that long allomorphs obligatorily arise in one additional environment: in the final position of left-side topics. Though this cannot be seen with status suffixes (since verbs do not topicalize in Chuj and K'iche'), it can be observed with *ni'o'*, which, as a third person pronoun can appear last in a topicalized constituent:

(11) Ha ni'o'$_k$ / *ni [$_{CP}$ ix-s-man jun onh ni$_k$ ewi].
TOP PRON.M PFV-A3-buy INDF avocado PRON.M yesterday
'As for him, he bought an avocado yesterday.'

Finally, note that long allomorphs correlate with a general tendency toward final rising intonation in both languages (see Henderson 2012 on K'iche'). This follows a general pattern across Mayan, where it is well established that declaratives exhibit final rising intonation, as documented in work such as Berinstein 1991 and DiCanio and Bennett 2018. This literature generally associates this boundary tone with the edge of an ι-phrase. High boundary tones are also found right before complement clauses and at the end of topicalized constituents (where long allomorphs arise). Chuj is no exception. A high boundary tone before a Chuj complement clause and at the end of a sentence is shown together in the pitch track in (12), which corresponds to the example sentence in (10b).

(12) *Pitch track for Chuj (10b)*



5. An alternative account without mismatches

I now propose an alternative account of prosodic allomorphy in Chuj, which derives the distribution of ι-phrase boundaries and long allomorphs without resorting to mismatches. The proposal is partly based on Aissen 1992, and follows some of the insights in Henderson 2012. Specifically, I follow Henderson (2012) in proposing that prosodic allomorphy is determined by phonology (see Henderson 2012 for arguments):

(13) Long allomorphs arise immediately before ι-phrase boundaries.

I depart from Henderson 2012 in two crucial respects. First, I propose a simplified syntax-prosody mapping algorithm, which derives ι-phrase boundaries by only making reference to the *right edges* of CPs:

(14) An ι-phrase boundary is found at the right edge of every CP.

Second, I argue that complement clauses and clausal adjuncts (including *because*-clauses) exhibit a different syntax than the one assumed in Henderson 2012:

(15) Complement clauses and clausal adjuncts surface above the matrix CP.

In other words, complement clauses and *because*-clauses have to appear above the domain of the matrix CP (at least in surface syntax).

Finally, to account for the presence of long allomorphs after topicalized constituents, as in example (11), I add the generalization in (16), based on work in Wagner 2005, 2010 (also see the proposal in Aissen 1992 that topics in Mayan form their own ι-phrase).

(16) Phrases that adjoin to a phrase ending with a prosodic boundary *x* also end with a prosodic boundary *x*.[4]

With the generalization in (16), we predict that all projections that adjoin above the CP node will end with an ι-phrase boundary (abbreviated as "ι-p" below).

In the next subjections, I show that this proposal successfully derives the distribution of prosodic allomorphy in Chuj and K'iche' without having to resort to mismatches. I first show evidence that complement clauses occupy a high peripheral position in section 5.1, and then show that similar facts hold for *because*-clauses in section 5.2. Finally, in the last subsection, I provide three additional arguments in support of the proposal.

5.1 Complement clauses

I discuss three pieces of evidence that support the claim in (15) that complement clauses occupy a high peripheral position in the syntax. The first piece of evidence comes from word order. Basic word order in K'iche' and in the variants of Chuj under study is VOS (see e.g. Clemens and Coon 2018). This is exemplified in examples with two DP arguments, such as the Chuj example in (17).

(17) Ix-y-il {*ix Malin} waj Xun {ix Malin}
PFV-A3-see CLF Xun CLF Malin
'Malin saw Xun.' (Chuj)

[4] Alternatively, we could assume topicalized constituents involve full CPs with elided material, following Ott 2014. This would eliminate the need to posit (16). I remain agnostic about which option is better.

For both languages, however, there is an exception to this order. When the complement of the verb is a CP, it must appear after the subject (unless the CP extraposes preverbally).

(18) Ix-y-al {ix Malin} [$_{CP}$ to ix-ach-b'at-i] {*ix Malin} .
PFV-A3-say CLF Malin COMP PFV-B2S-go-SS
'Malin said that you went.' (Chuj)

This difference in word order is well documented across Mayan languages (see e.g. Craig 1977 and Aissen 1992 for Tsotsil and Popti'), including in K'iche' (Henderson 2012, Can Pixabaj 2015). A relevant K'iche' example is provided in (19).

(19) X-k-eta'maj le winaq [$_{CP}$ chi x-u'l le ajtijaab'].
PFV-A3P-know the people COMP PFV-come the teachers
'The people knew that the teachers arrive.' (K'iche', Can Pixabaj 2015)

These facts led Aissen (1992, 2017) to propose obligatory extraposition of CPs to the right. However, she proposes that they extrapose to a lower position, following a restriction in Government and Binding Theory that extraposed material must adjoin to the specifier of the projection from which they originate (Chomsky 1986).

The proposal in (15) involves extraposition of complement clauses, but to a higher position: above matrix CP. The crucial point is that obligatory VSO order with CP objects is a welcome syntactic prediction of the proposal—if complement clauses occupy a position outside the domain of the matrix CP, then they are predicted to appear after the subject.[5]

The second piece of evidence that complement clauses adjoin high comes from the fact that they exhibit parallelisms with DP topics, which I take, following Aissen (1992), to adjoin above the matrix CP. The evidence is only shown for Chuj, which features overt topicalization morphology (but see also Can Pixabaj 2004 on right-side topics in K'iche'). In Chuj, DP topics must appear with the marker *ha* and a resumptive pronoun coindexed with the topicalized constituent (Bielig 2015). Though left topics are more common, right topics are also possible:

(20) a. [$_{TOP}$ **Ha ni unin**]$_k$ ix-b'at ni'o'$_k$ / *ni .
TOP CLF child PFV-go PRON.M
'The child, he left.' (left-side topic)

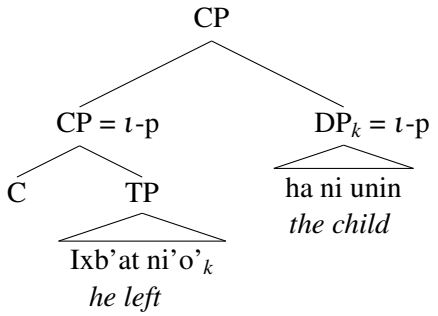
b. Ix-b'at ni'o'$_k$ / *ni [$_{TOP}$ **ha ni unin**]$_k$.
PFV-go PRON.M TOP CLF child
'He left, the child.' (right-side topic)

Bielig (2015) presents evidence that Chuj DP topics are "external" (as opposed to "internal" topics, see Aissen 1992), meaning that they adjoin outside the domain of the matrix CP. I

[5]It is worth noting that subjects are generally taken, across Mayan, to remain in their base-generated position in Spec, *vP* (see Clemens and Coon 2018 and references therein).

therefore represent topics as adjuncts to CP, as schematized in (21) for the right topic in (20b), but they could also be part of higher functional projections.

(21)



Long allomorphs are obligatory immediately before right topics, as illustrated in (20b) (nb. the presence the long allomorph *ni'o'*). I take this as additional evidence that these topics are outside the domain of the matrix CP and that, per (16), form an ɪ-phrase of their own.

Consider now a different example, (22), where the verb appears immediately to the left of the DP topic. As shown, this forces the presence of the status suffix before the DP topic:

(22) Ix-w-il-a' / *Ø *pro*$_k$ [$_{\text{TOP}}$ ha y-ib' ix]$_k$.
PFV-A1S-see-SS *pro* TOP A3-strength PRON.F
'I saw it, her strength.'

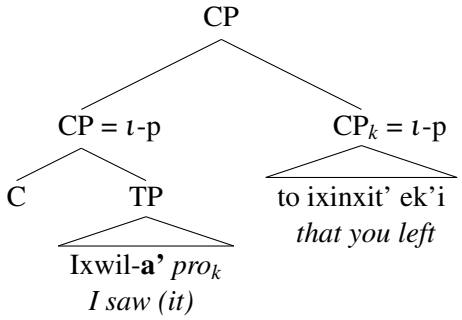
Notice here that no overt resumptive pronoun is present, causing the verb to appear immediately before the DP topic. Such examples can arise due to the fact that not all nouns in Chuj are pronominalizable. Since noun classifiers (which are used as pronouns) only appear with a subset of the languages nouns (mostly those that denote concrete entities), abstract nouns such as 'strength' (as in (22)) have no corresponding classifier, and therefore no corresponding resumptive pronoun (Buenrostro et al. 1989; Royer 2019).

It is with examples like (22), then, that a parallel between complement clauses and DP topics reveals itself. Recall from example (3) that status suffixes are also required before complement clauses. As schematized in (23), complement clauses (when immediately following verbs) pattern like topicalized DPs, and unlike *in situ* DPs, in triggering the obligatory presence of a status suffix on the verb.

(23) a. VERB-SS / *Ø [$_{\text{CP}}$ ...] cf. (3)
b. VERB-SS / *Ø [$_{\text{DP}_{Top}}$ ...] cf. (22)
c. VERB-*SS / Ø [$_{\text{DP}_{in\ situ}}$ ...] cf. (1b)

Under the current proposal, the parallel between DP topics and complement clauses is expected: both occupy a position outside the domain of the matrix CP. For now, I assume they are base-generated high, and like DP-topics, are coindexed with a null *pro* in the matrix clause, as illustrated in (24). Note, however, that nothing hinges on the "base-generation" analysis. That is, they could also end up in their surface position through movement.

(24)



Finally, a third piece of evidence that suggests that complement clauses occupy a high peripheral position is their position with respect to adverbs, as shown in (25). In both languages, adverbs can only appear before complement clauses (or at the beginning of the utterance). If complement clauses were sisters to the verb, as proposed in Henderson 2012, then we would expect VP modifiers to freely appear after the CP, contrary to fact.

(25) W-ab' {ewi} [$_{CP}$ to tz-ex-b'at-i] {*ewi}.
A1S-hear yesterday COMP IPFV-B2P-go-SS yesterday
'I heard yesterday that y'all are going.'

5.2 *Because*-clauses

In this section, we return to the central issue: the syntax-prosody mismatch posited in Henderson 2012 to account for the obligatory presence of long allomorphs prior to *because*-clauses. Though an example was provided in (8) for K'iche', below is a Chuj example:

(26) Ix-way ni'o' / *ni [y-oj-to tekumb'elal w-aj ni'o'].
PFV-sleep PRON A3-for-COMP tired A1S-be PRON
'He slept because he was tired.' (Chuj)

In both languages, *because*-clauses are headed by "relational nouns", which across Mayan function like prepositions in introducing adjuncts (see e.g. Aissen et al. 2017). Following Henderson, I represent *because*-clauses as PPs, though the exact category is not crucial.

Recall that Henderson assumes that *because*-clauses adjoin to the VP level. Given the syntax-prosody mapping algorithm he provides in (4b), a problem arises with examples like (26), as shown in (27) (same mismatch as the one in (9), but for Chuj). In fact, there is both an undergeneration and overgeneration problem, as described in (28).

(27) a. (. . . **ni** *yoj*)$_{ι\text{-phrase}}$ || (*to* . . .)$_{ι\text{-phrase}}$ (predicted prosody)
b. (. . . **ni'o'**)$_{ι\text{-phrase}}$ || (*yoj to* . . .)$_{ι\text{-phrase}}$ (actual prosody)

(28) i. *Undergeneration*: The algorithm does not predict the ι-phrase boundary found out at the left edge of the PP;

ii. *Overgeneration*: No ι-phrase boundary is found at left edge of the CP that the relational noun takes as a complement, but the algorithm predicts one.

In order to resolve these issues, Henderson proposes a constraint that overrides the one-to-one correspondence between syntax and prosody:[6]

(29) COMPLEMENT-ϕ
A functional head is parsed into the same phonological phrase as its syntactic complement. (Henderson 2012, 68)

This constraint, based on the SENSE UNIT CONDITION (Selkirk 1984, 1986), forces the relational noun (*rumal* in K'iche' and *yoj* in Chuj) to appear in the same phonological phrase as its complement. Since its complement is a CP, it will form part of an ι-phrase.

The present proposal, on the other hand, predicts the presence of an ι-phrase boundary before *because*-clauses without mismatches. Since *because*-clauses adjoin outside the domain of the matrix CP, and since the right edges of CPs trigger an ι-phrase boundary, an ι-phrase boundary is predicted to be found immediately before the *because*-clause. Moreover, the simplified syntax-prosody mapping algorithm in (14), which does not make reference to the left edges of CPs, does not overgenerate a boundary between the PP head and the rest of the *because*-clause. In the rest of this section, I show that this alternative is empirically motivated.

One piece of evidence comes from the position of *because*-clauses relative to topicalized constituents. In Chuj, *because*-clauses (BC.CP) are judged more natural when they appear after topics, rather than before them, as in (30).

(30) Ix-b'at winh [ha winh winak] [$_{\text{BC.CP}}$ yojto ix-och s-wejel winh].
PFV-go PRON TOP CLF man because PFV-enter A3-hunger PRON
'As for the man, he left because he was hungry.'

The same distribution is observed with complement clauses. *Because*-clauses in Chuj are judged more natural when they appear after the complement clause:[7]

(31) Ix-y-al waj Xun [$_{\text{COMP.CP}}$ to ix-b'at ix Malin] [$_{\text{BC.CP}}$ yojto
PFV-A3S-say CLF Xun COMP PFV-go CLF Malin because
ix-y-al waj Petul t'a winh].
PFV-A3S-say CLF Petul PREP PRON
'Xun said that Malin went because Petul told him.'

[6]Though space prevents me from presenting any evidence here, it is improbable that this constraint is active in Chuj. It is common to find measurable prosodic breaks between functional heads (including Ps) and their complements.

[7]*Because*-clauses do not *need* to appear before topicalized constituents and complement clauses. This is not surprising if both adjoin above the CP level as adjuncts.

These data suggest that clausal adjuncts (including *because*-clauses) can adjoin *very high* in the structure, above topicalized constituents and complement clauses, which were shown in section 5.1 to adjoin outside the domain of the matrix CP.

Another piece of evidence for the high attachment of clausal adjuncts is specific to K'iche'. In this language (and other K'ichean languages), the extraction of adjuncts triggers the obligatory presence of the clitic *-wi(h)* (see e.g. Mendes and Ranero 2019 and references therein for a detailed account of adjunct extraction in K'iche'):

(32) Jas r-uuk' x-Ø-ki-tij **wi** le ki-rikiil?
WH A3S-SR PFV-B3S-A3P-eat WI DET A3P-food
'With what did they eat their food?' (Can Pixabaj 2015)

Mendes and Ranero (2019) show that *-wi(h)* never occurs with clausal adjuncts, as in the *why*-question in (33). This is predicted by the current proposal: clausal adjuncts never trigger *-wi(h)* because they are base-generated high, and therefore never undergo extraction.

(33) *Jacha' x-ki'-an **wih**?
why PFV-A3P-do WI
Intended 'Why did they do it?'

Finally, a last piece of evidence comes from the position of *because*-clauses relative to other adjuncts. If *because*-clauses attached at the VP-level, as claimed in Henderson 2012, then we might expect that they could optionally appear before other VP adjuncts, or any higher modifier for that matter. However, this is not possible, as shown in (34).

(34) Context: *In Nentón, I bought the book that you asked me for.*

a. Ix-in-man jun ch'anh libro [$_{PP}$ t'a Nentón] [$_{ADJ.CP}$ yojto
PFV-A1S-buy INDF CLF book PREP Nentón because
ix-a-k'an ch'anh t'ay-in] .
PFV-A2S-ask PRON PREP-B1S
'I bought a book in Nentón because you asked me for it.'

b. #Ixinman jun ch'anh libro [$_{ADJ.CP}$ yojto ixak'an ch'anh t'ayin] [$_{PP}$ t'a Nentón]

The context in (34) forces an interpretation where the PP adjunct modifies the matrix verb. As shown by the infelicity of (34b), the only way for this interpretation to arise is if the PP adjunct appears before the *because*-clause, as predicted by the current proposal.

5.3 Additional arguments

In this section, I lay out two final arguments in favour of the current proposal. The first argument comes from *optionality*. Consider first the utterance in (35), which shows that Chuj long allomorphs are optional before certain PP adjuncts.[8]

(35) Ix-in-b'at-(i) [$_{PP}$ t'a ha-pat].
PFV-B1S-go-SS PREP A2-house
'I went to your house.'

It is not clear how the proposal in Henderson 2012 would handle the optional presence of long allomorphs before PP adjuncts, but an analysis that resorts to different syntactic configurations as the determining factor in the realization of ɪ-phrase boundaries can explain this optionality. We simply need to allow Chuj PP adjuncts to adjoin either to the VP or above the CP. Whether or not K'iche' can also exhibit variability in the positioning of such PP adjuncts is to be determined, but the present argument is not contingent on this datapoint. A reasonable possibility could be that Chuj and K'iche' are different, in that the former allows two adjunction sites for PP adjuncts, while the latter only allows one.

The second piece of evidence comes from the behaviour of relative clauses. Recall that Henderson aligns ɪ-phrases with the left edges of CPs. This predicts that an ɪ-phrase boundary should appear between the head of a relative clause and the rest of the relative clause:

(36) a. [… *head* [$_{CP}$ *relative clause*]] (syntax)
b. (… *head*)$_{ɪ\text{-}phrase}$ ‖ (*relative clause*)$_{ɪ\text{-}phrase}$ (predicted prosody)

In contrast, the algorithm proposed here only predicts ɪ-phrase boundaries at the right edge of CPs. That is, no ɪ-phrase boundary is predicted between the head and the relative clause.

Although no long allomorph can instantiate the head of a relative clause in K'iche', Chuj classifier pronouns can, making it possible to test these different predictions. As shown in (37), only the short allomorph *ni* can appear as the head of a relative clause, and not its long allomorph counterpart *ni'o'*:

(37) Ix-w-il [$_{DP}$ ni / *ni'o'] [$_{CP}$ tz'-al-an q'anjob'al]].
PFV-A1S-see PRON.M IPFV-speak-AF Q'anjob'al
'I saw the one who speaks Q'anjob'al.' (lit: I saw he who...). (Chuj)

[8] Complement PPs (those that appear to be selected by the verb) do not give rise to this optionality:

(i) Ak'-em-*i / Ø [$_{PP}$ t'a sat te' mexa].
put-DIR.down-SS PREP face table
'Put it on the table.' (nb. in this example, the pronoun is not overtly realized)

Chuj therefore provides evidence for the algorithm proposed in this paper, and against the algorithm provided in Henderson 2012—long allomorphs cannot head relative clauses.

6. Conclusion

In this paper, I provided an account of prosodic allomorphy in two Mayan languages: Chuj and K'iche'. Though I followed Henderson (2012) in positing that long allomorphs are conditioned by phonology, I proposed a different syntax–prosody mapping algorithm that does not rely on mismatches. By forcing a one-to-one correspondence between syntax and prosody, interesting predictions about the syntax were made, and these were shown to be borne out. This is expected if certain types of mismatches are in fact impossible, and apparent instances of mismatches serve as evidence that the syntactic analysis must be revisited, as suggested in work by Steedman 1991, Wagner 2005, 2010, and Hirsch and Wagner 2015 (the latter two authors also suggest that apparent mismatches should be analyzed as right extraposition). Though the goal of this study was not to show that mismatches are *never* possible, I believe that the most interesting hypothesis should be that there are none. Doing so can lead to important findings relevant to the way syntax works (as shown here) and allows us to consider prosody as a reliable tool for syntactic evidence.

The proposal reveals many interesting properties of complement clauses and clausal adjuncts in both languages (and potentially across other Mayan languages): that they occupy a very high position in the syntax. Future work should explore the reasons behind this. For instance, it is conceivable that complement clauses appear extraposed for semantic reasons, as argued for CPs more generally in Moulton 2015. In fact, Coon (2019) recently argues that verbal roots in Chuj require semantic saturation with an argument of type *e*. But CPs, generally conceived as propositions or predicates, do not denote entities The proposal laid out here could offer an argument of the right type to semantically compose with the verb: a resumptive pronoun of type *e*.

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