

Phonological effects of movement gaps

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1. Introduction

A fundamental question in syntactic research has been how best to represent displacement. In syntactic theories employing Merge as the basic structure building operation, there are at least two distinct conceptions of movement. The first is one in which movement consists of a filler and several distinct ‘gap’ positions that may correspond to either a deleted copy of that phrase (Grinder 1972, Chomsky 1995, Nunes 2004) or a phonetically-null trace (Chomsky 1973, 1995, Fiengo 1977). As representative of each of these approaches, I will simply use the more neutral notation of a gap (___), as in (1a). The second approach, known as multidominance, embodies the idea that movement involves a single element occupying multiple positions (1b) (e.g. Citko 2005, Gračanin-Yüksek 2007, Johnson 2012, Bachrach & Katzir 2017). Here, gaps as such do not exist other than as a by-product of the linearization algorithm, where the moved element is pronounced in only of the positions it occupies.

- (1) a. Which song₁ is John happy [CP ___₁ that Paul wrote ___₁] ?
b. ___ is John happy [CP ___ that Paul wrote ___] ?
which song

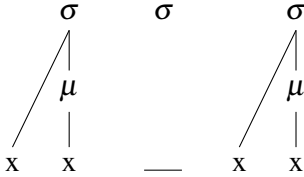
In this paper, I would like to put forward the following observation: There are several cases in which it looks like the position of a gap generated by A'-movement interacts phonologically with material in its immediate vicinity. I will argue that this provides an argument that movement gaps should be treated

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as representationally distinct from the associated filler, as in (1a). Accounting for such data is a serious challenge for multidominance analyses (1b).

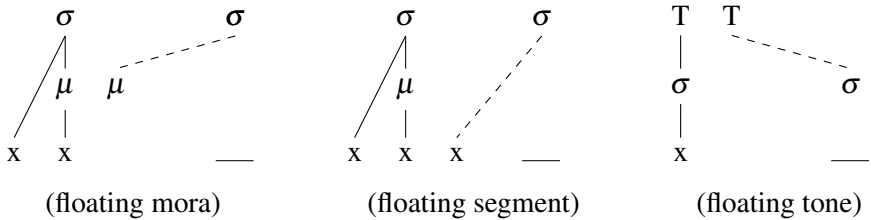
The main idea I will pursue here is that movement gaps correspond to a prosodically defective representation, namely a floating syllable node. In an autosegmental representation, this looks as follows:

(2) *Movement gaps are prosodically defective representations*



As we will see, there are cases in which this unassociated syllable node has a reductive effect on neighbouring phonological material. In particular, it may interact with unassociated autosegmental elements, forcing them to attach in order to satisfy high-ranked markedness constraints against an undominated/undominating syllable node (cf. SPECIFY; Yip 2002). In the various case studies we will see, I argue that autosegments from three different representational tiers attach to the floating syllable node associated with a movement gap, namely moras, segments and tones:

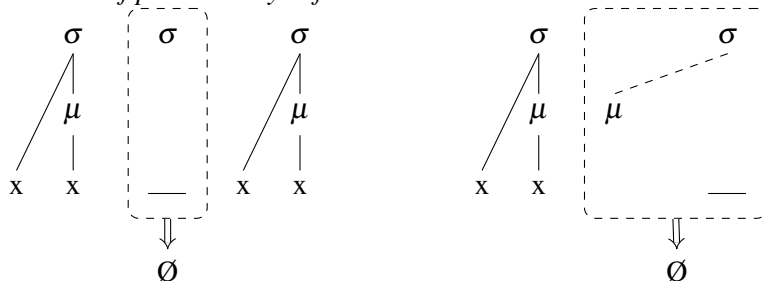
(3) *Floating autosegments attach to prosodically-defective gaps*



Given the prosodic defectiveness of the representation above, I assume that the floating syllable node associated with the movement gap must ultimately be eliminated from the phonological representation. There are a few options here. This may be due to some PF process applying to movement chains (e.g. Copy Deletion; Nunes 2004) or by some phonological ‘clean-up’ operation such as *Stray Erasure* (Steriade 1982, Harris 1983) that applies to illicit phonological representations before prosodification. Crucially for the analysis here, any

material that has previously associated with the floating syllable node will also be deleted as part of this process:

(4) *Deletion of prosodically defective structures*



While I will not be able to discuss every detail of this proposal here, this overview should suffice to appreciate the general idea and how it will apply to the relevant data.

Before moving on, I should briefly mention that I will only consider movement gaps in base positions and at Spec-CP. It is possible that there are further copies that should be considered at locations, such as Spec-*v*P, which can complicate matters significantly. With that said, the status of Spec-*v*P and other potential intermediate landing sites is still somewhat controversial (see e.g. Keine 2020, Keine & Zeijlstra to appear).

2. Case study #1: Past tense deletion in Akan serial verb constructions

The first example I would like to discuss is a, to the best of my knowledge, previously unnoticed observation about tense marking in serial verb constructions (SVCs) in Akan. In Akan, the past tense marker is a suffix on the verb that copies the final vowel of an open syllable, for example. In a SVC, the past tense marker is found on both verbs (5a). Interestingly, if the object of the first verb is A'-moved, the tense suffix on the first verb in the series must be absent (5b). The second verb remains unaffected. If the indirect object of the second verb is extracted, then both tense suffixes are preserved (5c).¹

¹This is also true if the extractee leaves a gap rather than a resumptive pronoun (data not given here). The data here are all from Sampson Korsah (p.c.).

- (5) a. Kofí tó[-ɔ] bayéré ma-a Ám'má
 Kofi buy-PST yam give-PST Ama
 'Kofi bought yams and gave them to Ama.'
- b. Déén₁ na Kofí tó[*-ɔ] —₁ má-a Ám'má nó
 what FOC Kofi buy give-PST Ama CD
 'What did Kofi buy and give to Ama?'
- c. Hwán₁ na Kofí tó[-ɔ] bayéré má-a nó₁ nó ?
 who FOC Kofi buy-PST yam give-PST 3SG CD
 'Who did Kofi buy the yams and give them to?'

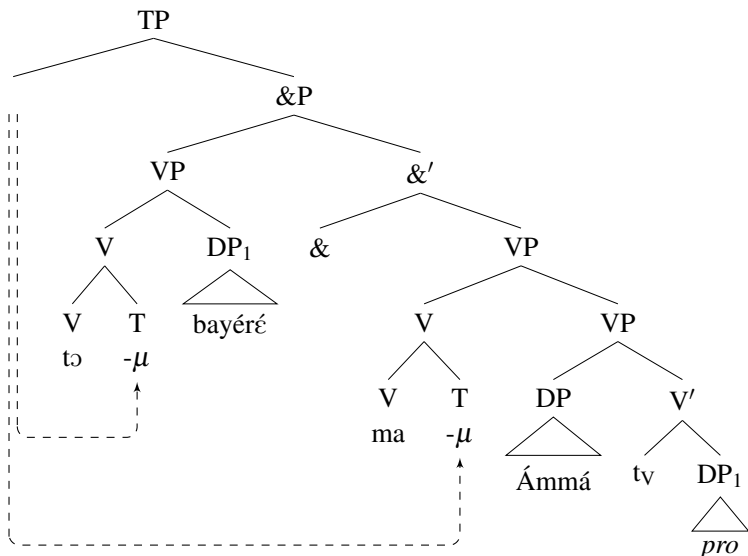
To the best of my knowledge, this effect is not found with any other affix type. For example, the progressive prefix *re-* remains on the first verb even if the object of that verb is extracted (6b). It should be noted that the tense suffix is only the TAM marker that appears on both verbs. In all other tense/aspect combinations, all but the first verb are invariably marked by a special suffix *a-* that is specific to SVCs and is sometimes called the 'consecutive', as I have glossed it below (see Forson 1990, Hellan et al. 2003, Boadi 2008).

- (6) a. Kofí [re-]bobó entomá a-to fam
 Kofi PROG-fold cloth CONS-put ground
 'Kofi folded the cloth and put it on the ground.'
- b. Déén₁ na Kofí [ré-]bóbó —₁ a-tó fam nó ?
 what FOC Kofi PROG-fold CONS-put ground CD
 'What did Kofi fold and put on the ground?'
- c. Èhén₁ na Kofí [ré-]bobó entomá a-tó —₁ nó ?
 where FOC Kofi PROG-fold cloth CONS-put CD
 'Where did Kofi fold the cloth and put it?'

The generalization at this point is clear: In SVCs, a past tense marker on the first verb is deleted if it is adjacent to a movement gap (5b). Why is this effect limited to the past tense marker? I argue that this is due to the fact that, unlike other TAM markers, the past suffix is represented by a floating phonological element, namely a mora (μ) (Ofori 2006, Zimmermann 2017). This captures the fact that the final segment is always lengthened, even when it is a nasal (e.g. *nom* 'to drink' – *nom-m* 'drank').

I assume that SVCs involve a coordination structure and that the subject is shared by means of ATB-movement, as shown for (5a) in (7). Following Collins (1997), I treat object sharing as involving a silent *pro* in the object position of the second verb. In SVCs in particular, I assume that the past tense suffix is lowered to each verb in an ATB-fashion (Georgi 2019).²

(8) *ATB-lowering of affixes in Akan SVCs*



²This assumption is important in accounting for why we do not find the apparent deletion of the tense suffix outside of serial verb constructions, e.g. when the object of a verb is extracted.

- (7) Déén₁ na Kofí tó[-ɔ] —₁
 what FOC Kofi buy
 ‘What did Kofi buy?’

Here, I follow Kandybowicz (2015) who shows that the verb only moves to T in past tenses with *-μ*. When the verb moves to T, as in (7), it is not in the same domain/phase as the object gap (vP) in order to be able to interact with it phonologically. Only when the affix is lowered do we have the preconditions for the movement gap to ‘see’ the moraic suffix.

Given this structure, when the direct object of *t* is extracted, the floating mora will be adjacent to a movement gap in the phonological computation. For the sake of concreteness, we assume the following constraints. First, there are two SPECIFY constraints. The first SPECIFY(σ, μ) (or $\sigma \Rightarrow \mu$) is violated by a syllable that does not dominate a mora in the output. The constraint SPECIFY(μ, x) (or $\mu \Rightarrow x$) is violated by any mora that does not dominate a segment. Finally, I assume a faithfulness constraint DEP-AL that punishes insertion of association lines. How this comes together for the relevant part of the representation in (5b) can be seen in the tableau in (9).

(9)

		σ \downarrow μ	μ \downarrow x	DEP-AL
a.		*!	*	
b.		*!		*
c.			*	*

In the absence of a movement gap, the relevant competition would be between (9a) and (9b) (without the floating syllable). Due to the DEP constraint being lower ranked than SPECIFY($\mu \Rightarrow x$), we would prefer to associate the mora with the closest segment, thereby lengthening it (10b). This option is blocked by a high-ranked preference in the presence of a movement gap, however.

Given a floating syllable node, the higher ranked SPECIFY constraint forces the mora to associate ‘upwards’ to the floating syllable instead.³ As previously mentioned, the floating syllable corresponding to the gap will be deleted along with any material associated with it. This is what leads to the deletion of the past tense marker on the first verb of an SVC. If an affix is not a floating autosegment, such as progressive *re-*, then high-ranked faithfulness constraints (MAX) protect against deletion of existing association lines and the floating syllable node has no discernable effect.

3. Case study #2: Downstep deletion in Kikuyu

The second case study we will consider involves downstep deletion in the Bantu language Kikuyu. Downstep deletion in Kikuyu is one of the earliest discussed examples of a reflex of syntactic movement (e.g. Clements et al. 1983, Zaenen 1983, Clements 1984a,b, Haik 1990). The descriptive generalizations are relatively complex. In Kikuyu, there is a particular kind of downstep (a decrease in pitch register between two high tones represented as ¹) that exhibits some mobility.⁴ As can be seen in (10), the downstep is assumed to originate on a finite verb and moves rightward (skipping over the indirect object and complementizer) until it encounters another underlying high tone.⁵

³One might wonder why it is not possible to associate the mora with both the syllable and the segment. I have not considered this candidate here, even though it would have a better violation profile than the others. The problem will ultimately be that, since the syllable node will be later deleted, associating the segment to it via the mora would lead to deletion of the vowel. Thus, this candidate must be ruled out either locally (by some additional constraint(s) in the tableau above) or globally in some other way.

⁴For ease of readability, I have omitted any static ‘lexical’ downsteps and only focused on the mobile downsteps that are relevant for this discussion.

⁵In general, the placement rules for the downstep are puzzling for a number of reasons, not least why the downstep seems to ‘skip’ certain constituents. For the example in (11), I would like to suggest that the spreading of downstep takes place from the base position of the verb, rather than its derived position in *v* given the base structure in (10).

(10) [_{VP} *v* [_{VP} Kanakε [_{V'} tell¹ [_{CP} ...]]]]

If we compare (12), we might think that the underlying representation of the complementizer is /áte/, thus begging the question why the downstep does not stop here. I contend that this initial high tone is actually the result of high tone spreading from the preceding word, a process that is often found in Kikuyu (Clements & Ford 1981, Clements 1984b). This would allow us to maintain that the complementizer is underlying completely low toned.

The effects of downstep are indirect. For the matrix downstep, the underlying low tones on *ate* and *Kariokĩ* become high. For the embedded clause, there is normally a Flattening rule that applies to turn sentence-final final high tones into low ones. This is blocked in (11) for *mó-tě* due to the presence of the shifted downstep. For reference, the relevant underlying representations that have been assumed in the literature are /ka:náké/, /ate/ and /kariokĩ/.

- (11) Kamaú é:r-é^{t'} Ka:náké [CP áte Kárió^{t'}kí á-tém-ír-é^{t'} mó-tě^{t'}]
 Kamau tell-T Kanake that Karioki SP-cut-T 3-tree
 ‘Kamau told Kanake that Karioki cut the tree.’
 (Zaenen 1983:473)

With this in place, let us now consider what happens when there is movement from the matrix clause, as in (12). Under extraction of the matrix indirect object, we do not find some of the effects of downstep. There is no overwriting of the lower tones on *ate* or *Kariokĩ*. However, the effect of downstep in the lower clause is apparent as the final lowering rule is still blocked, leading to the sentence-final rising tone. It therefore looks like the movement gap in the matrix clause leads to the absence of the downstep associated with the matrix verb, but not the embedded verb.

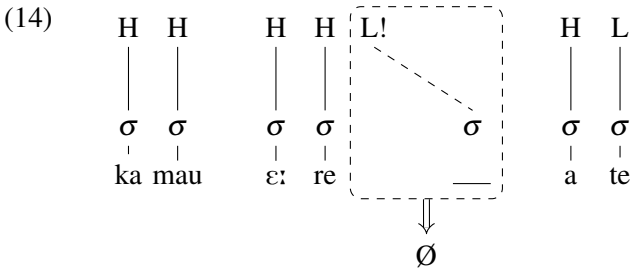
- (12) N-óo₁ Kámaú é:r-é^{t'} ___₁ [CP áte Kariokĩ á-tém-ír-é^{t'} motě^{t'}] ?
 FOC-who Kamau tell that Karioki SP-cut-T tree
 ‘Who did Kamau tell that Karioki cut the tree?’

If extraction takes place from the embedded clause, i.e. from the embedded subject position in (13), we see no effects of downstep in either clause. As in the preceding example, the effects of the matrix downstep are absent (no second high tone on *áte*) and the sentence-final Flattening rule has now successfully applied to *motě* due to the absence of the downstep.

- (13) N-óo₁ Kámaú é:r-é^{t'} Ka:náké [CP ___₁ áte [TP ___₁ o-tém-ír-é^{t'}
 FOC-who Kamau tell Kanake that PP-cut-T
 mote]] ?
 tree
 ‘Who did Kamau tell Kanake that it was who cut the tree?’

It is therefore clear that the relevant generalization is that a downstep is deleted if and only if there is movement in that clause. Previous analysis have tried to accommodate these data by positing deletion rules of various kinds that are sensitive to movement (Clements et al. 1983, Lahne 2008, Georgi 2014) or a lexical alternation that is sensitive to movement (Zaenen 1983). However, such examples of ‘reductive reflexes’ of movement are actually rather rare.

On the other hand, our hypothesis that gaps generated by movement may lead to the disappearance of floating autosegmental material fits these data well. In fact, a common analysis of downstep in autosegmental phonology is as a floating L tone, see e.g. Clements & Ford (1979) on Kikuyu. With this in mind, the presence of a gap would lead to the attraction of the floating downstep tone in a similar way to the floating mora in Akan. Given the complexity of the data and the current space limitations, I will not attempt to develop a fully-fledged phonological account here (indeed, no such account of the relevant data exists at present; though see Gjersøe 2015). However, a rough representation for the downstep deletion in (12) is given in (14).



This is a rather naïve analysis that does not take into account several important findings about the tonology of Kikuyu (see the following section), however it still allows us to appreciate how the Kikuyu data can be analyzed as the reductive effect of a movement gap. Normally, the downstep L tone (L!) would be subject to alignment constraints regulating its rightward float and subsequent H-tone spreading (as in (11)). In the presence of a movement gap, however, a higher-ranked constraint against toneless syllables (i.e. SPECIFY(T \Rightarrow σ)) kicks in and causes the downstep tone to dock onto the floating syllable which is later removed from the phonological representation.

4. Case study #3: High tone deletion in Kikuyu partial movement constructions

The third example of a potential phonological effect related to a movement gap comes from a different construction in Kikuyu. In a discussion unrelated to the one about downstep deletion, Clements (1984a) points out an intriguing pattern in Kikuyu partial movement constructions. In the *wh-in-situ* baseline, the final vowel of the verb in each clause bears a high tone (15a). If we have partial *wh*-movement to the intermediate CP, the second highest verb ‘say’ loses its final H tone, while the highest and lowest do not (15b). Finally, if the *wh*-phrase moves to the highest CP, then both the matrix and intermediate verbs lose their final H tones (15c).

- (15) a. ó-γw-[!]éciiri [-á] [CP Ngóγe a-úγ-ír [-é] [CP ate n-óo
 SP-T-think-FV Ngugi SP-say-T-FV that FOC-who
 o-ɔn-ír-é Kanake]] ?
 PP-see-T-FV Kanake
- b. ó-γw-[!]éciiri [-á] [CP n-óo₁ Ngóγe a-úγ-ír [-ε] [CP —₁
 SP-T-think-T FOC-who Ngugi SP-say-T-FV
 áte —₁ o-ɔn-ír-é Kanake]] ?
 that PP-see-T-FV Kanake
- c. n-óo₁ ó-γw-eciíri [-a] [CP —₁ Ngoγe a-úγ-ír [-ε] [CP
 FOC-who SP-T-think-FV Ngugi SP-say-T-FV
 —₁ áte —₁ o-ɔn-ír-é Kaanake]] ?
 that PP-see-T-FV Kanake
 ‘Who do you think Ngugi said saw Kanake?’

(Clements 1984a:47)

This pattern has received little to no attention in the subsequent theoretical discussion of movement reflexes. The empirical generalization as formulated by Sabel (2000:425) is that ‘verbs have special forms if and only if movement into or through the clause in which these verbs are located applies’. Though notice that the lowest verb does not change its form despite being in a clause containing movement in (15b–c). I would like to suggest that a better generalization is that the final H tone of the verb disappears if it is adjacent to a movement gap. Here, the relevant gap is a step of successive-cyclic movement at the edge of CP.

A potential objection here is that this pattern does not seem to fit with our current hypothesis that phonological effects of movement gaps are only found with floating autosegmental material. It seems that the fixed final tone of the verb is lost rather than some floating element. In fact, a closer look at tone assignment in Kikuyu reveals that this case may in fact be compatible with the generalization after all.

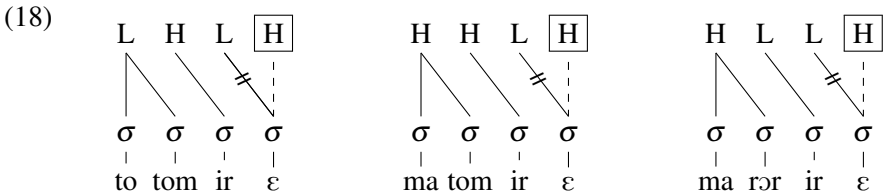
Clements (1984b) lays out the principles of tone assignment in Kikuyu verbs in quite some detail. The overarching insight he provides is that there is a systematic pattern in the way underlying tones are linked to syllables. In particular, the tone of the first syllable is always associated to the first two syllables, thereby causing all remaining tones to shift one to the right. (see McCarthy et al. 2012 for discussion of the theoretical consequences of this). To see this, consider the examples in (16). The verb *tóm* ('send') is underlyingly high-toned, but surfaces as low if the subject prefix bears an underlying low tone (16a). If the subject prefix has a lexical high tone, then the verb surfaces with a high tone (16b). In fact, this is true even for verbs that are underlyingly low-toned such as *rɔr* ('look at'). If the prefix is low-toned, then the stem stays low (16c). However, if the prefix is high, the underlyingly low-toned *rɔr* adopts a high tone (16d).

- (16) a. to-tom-ír-é (/to-tóm-ir-é/)
1 PL.SBJ-send-PST-FV
'We sent.'
- b. má-tóm-ír-é (/má-tóm-ir-é/)
3 PL.SBJ-send-PST-FV
'They sent.'
- c. to-rɔr-ir-é (/to-rɔr-ir-é/)
1 SG.SBJ-look.at-PST-FV
'We looked at.'
- d. má-rór-ir-é (/má-rɔr-ir-é/)
1 SG.SBJ-look.at-PST-FV
'They looked at.'
- (Clements 1984b:293)

Also notice that the tone of the TAM suffix *-ir* varies in these examples. It is high when adjacent to a stem with an underlying high tone (17a,b), whereas it is low-toned when adjacent to */rɔr/*.

All of these facts follow on the account proposed by Clements (1984b),

as shown for (16a), (16b) and (16d) in (17).⁶ The underlying high tone of the root shifts to the past tense suffix *-ir*. When the root is low, this suffix is assigned the low tone of the root (17c,d). While Clements (1984b) assumes that *-ir* does not have a lexical tone, I suggest that it is underlying low-toned and thus the H tone of the final vowel is left floating at the word level due to the rightward shift in tone assignment. Since the phrase/sentence-level phonology militates against floating high tones, this will later dock to the final vowel and trigger de-linking of the L tone.⁷



If the proposal is on the right track that the final H tone of verbs is actually floating, then we have the necessary conditions for it to interact with a movement gap. Rather than attaching to the final vowel as in (18), when adjacent to a floating syllable associated with a movement gap as in (15), the floating H tone would be compelled to attach to the floating syllable by a high-ranked constraint such as SPECIFY($T \Rightarrow \sigma$) against toneless syllables.

⁶With this said, the examples in (15) do not seem to show this 'initial plateau' systematically. I am not fully sure why this is. However, it is worth noting that Clements (1984b) mostly provides word forms in isolation, while Clements (1984a) transcribes full sentences. It seems likely that the word-level processes described here can be obscured by further tone spreading rules at the phrase/sentence-level.

⁷Contour tones do not seem to be permitted at the end of verbs. This is different for nouns, e.g. *Kariokī*, and the final H of the rising tone can spread to the following word under the right conditions (Clements & Ford 1981, Clements 1984b). Given the representations in (18), we might expect to find downstep between the final two H tones given the presence of the floating L. Indeed, many of the examples in Clements (1984a) appear to show this, e.g. (17), but not systematically so. At present, I am not sure whether this is a lack of consistency in transcription or the result of a more regular, poorly-understood process.

(17) Kamaú ne-a-ʒn-!r-ε Kaanáké
Kamau FOC-SP-see-T-FV Kaanake
'Kamau saw Kanake'

(Clements 1984a:46)

The H tone would then be deleted along with the defective phonological representation of the gap.

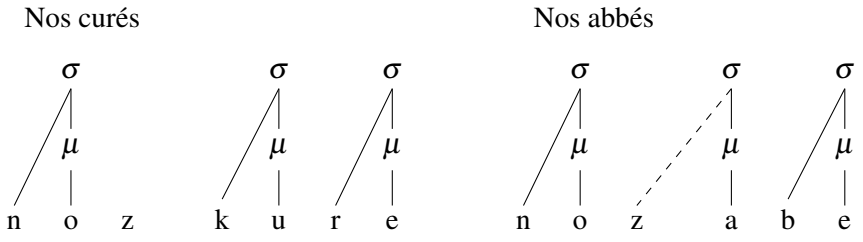
5. Case study #4: Liaison in French

Turning now to the fourth example of a phonological effect of a movement gap, let us consider the phenomenon of liaison in French. This refers to the observation that some lexical items trigger a ‘linking’ consonant when a vowel-initial word follows (19a). This consonant is otherwise absent, e.g. as a coda, when the following word begins with a consonant (19b).

- | | | | | |
|------|----|-----------------|----|--------------------|
| (19) | a. | Nos [noz] abbés | b. | Nos [no] curés |
| | | our abbots | | our priests |
| | | ‘Our abbots’ | | ‘Our priests’ |
| | | | | (Garrapa 2012:147) |

A common representational approach to liaison has been to treat this linking consonant as a floating (or extrametrical) segment in the underlying representation (see e.g. Booij & de Jong 1987, Tranel 1996, Durand 2001, Garrapa 2012). We can assume that this latent consonant is left floating at the end of the word-level phonology (20), similar to what we assumed for final H tones on verbs in Kikuyu. At the phrase-level, this consonant can associate to the following word if this maximizes onsets, as in (19a). Otherwise, it is left floating and therefore unrealized.

(20)



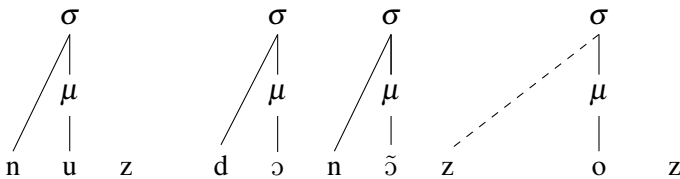
Since this is a floating segment at the sentence level, we might expect it to be susceptible to the reductive effect of movement gaps. Indeed, this is

what Selkirk (1972) claimed. She claimed that, at least in some idiolects of French, liaison is blocked across a gap generated by relativization and wh-movement.⁸ As a baseline, consider the following examples from Selkirk (1972:248) illustrating liaison:

- (21) a. Nous donnerons $\widehat{\hspace{1.5cm}}$ une grande somme à l'organisation
 we will.give a large sum to.the.organization
 'We will give a large sum to the organization'
- b. Nous donnons $\widehat{\hspace{1.5cm}}$ aux institutions charitables les plus
 we give to institutions charitable the most
 chics
 fashionable
 'We give to the most fashionable charitable institutions'

Given the representational theory of liaison outlined above, a very rough analysis of the example in (21b) is given in (22). Here, we see the latent consonant of the verb attaching to the preposition.

- (22) Nous donnons aux ...

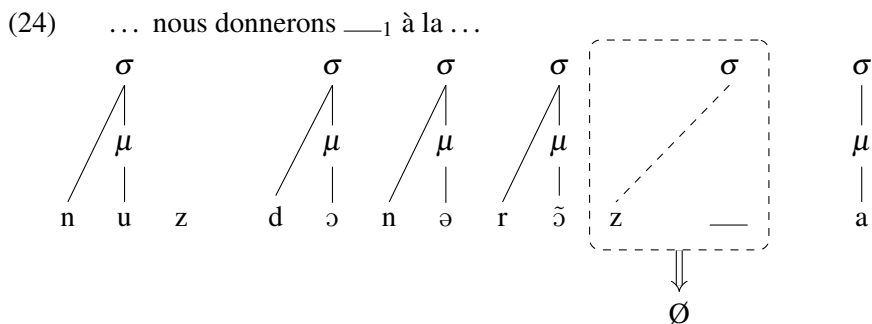


Crucially, Selkirk (1972:248) argues that, in comparable examples with a gap generated by A'-movement, we do not find liaison for some speakers. The following examples show both relativization (23a) and wh-movement (23b).

⁸In what follows, I will take Selkirk's claims for granted. Durand (2001) casts doubt on the reliability of this generalization based on elicitation with speakers, stating that several speakers do in fact have liaison across an A'-gap. This does not mean that the idiolects that Selkirk was describing do not exist, however. Apart from this, Selkirk's claim has not yet been subjected to serious empirical scrutiny, as far as I can tell.

- (23) a. La somme₁ que nous donnerons $\overset{\times}{\text{---}_1}$ à l'organisation
 the sum which we will.give to the.organization
 'The sum which we will give to the organization'
- b. Qu'₁est-ce que nous donnerons $\overset{\times}{\text{---}_1}$ à l'organisation
 what.is.it which we will.give to the.organization
 'What will we give to the organization?'

Here, the analysis would be similar to what we have seen so far. For the examples in (23), the presence of a movement gap would compel the floating consonant to attach to the floating syllable node rather than to provide an onset of the following word. A rough analysis is given in (24).



This suggests that the relevant constraint SPECIFY($\sigma \Rightarrow x$), requiring that a syllable dominates a segment, would have to outrank ONSET. After the consonant has attached to the syllable introduced by the movement gap, it is later removed due to its prosodic deficiency (e.g. lacking a nucleus/mora).

6. Case study #5: English *wanna*-contraction

The final example I will present is an oft-repeated argument for traces going back to Lakoff (1970) (citing Larry Horn, p.c.). The basic observation is that *Who do you want to succeed?* is ambiguous because *want* can be a control verb (25a) or an ECM verb (25b) (while *succeed* may also be transitive).

- (25) a. Who do you want PRO to succeed ---_1 ?
 b. Who do you want ---_1 to succeed?

This ambiguity is lost, however, if *want* and *to* contract into *wanna*. Thus, (26) may only have the control verb interpretation (25a) and not the ECM interpretation (25b). In cases which are unambiguously ECM (26b), contraction is impossible.

- (26) a. Who do you *wanna* succeed? ≠ (25b)
 b. *Who do you *wanna* succeed you?

The reason for this has been argued to be the presence of a trace between *want* and *to* that blocks contraction from applying, thereby providing evidence for the phonological reality of traces (Chomsky & Lasnik 1977; but cf. Postal & Pullum 1978 and much subsequent debate).

For present purposes, I want to focus on how *wanna*-contraction may fit into the current view that movement gaps may trigger deletion of underlyingly floating autosegmental material. In order to do this, I take inspiration from the rule-based analysis in Suiko (1978). Suiko's analysis of *wanna*-contraction derives the process as the result of two ordered rules. The first is word-final post-*n* /t, d/ deletion (27a), whose application can be seen in forms like [wɛn] (*went*) or [hævən] (*haven't*). The second rule in (27b) is similar, but can apply across word boundaries and is restricted to /t/ before an unstressed vowel, as in [wʌnəd] (*wanted*), [sænə] (*Santa*) or [frʌnev] (*(in) front of*).

- (27) a. Word-final post-*n* /t, d/ deletion
 /t, d/ → Ø / n ___ #
 b. Post-*n* /t/ deletion
 t → Ø / n (#) ___ $\left[\begin{array}{c} \text{V} \\ \text{-stress} \end{array} \right]$

In Suiko's derivation of *wanna*-contraction, the rule in (27a) applies first to delete the final /t/ of *want*.⁹ Now, the more general /t/-deletion rule can apply across the word boundary to remove the initial /t/ of *to*. Once other phonological rules have applied, we arrive at the desired output *wanna*.

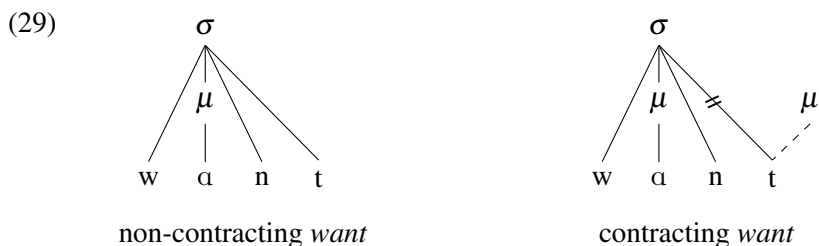
⁹An alternative approach in Selkirk (1972) involves a 'degemination' rule to delete the final /t/ of *want*.

(28)

<i>want</i> # tə/	
<i>wan</i> # tə	(27a)
<i>wan</i> # ə	(27b)
<i>wanə</i>	(other rules)
[wanə]	

I follow Suiko in assuming that this is how *wanna*-contraction is derived phonologically, however I will assume that the final /t/ may be optionally deleted in the class of words undergoing *to*-contraction as a lexical property instead of by the rule in (27a). To achieve this, I follow the leading idea in Trommer & Zimmermann (2014) that deletion can be triggered by the presence of a floating mora. Trommer & Zimmermann (2014) use this assumption to derive various cases of ‘subtractive morphology’ in which deletion is used to mark grammatical distinctions. For example, the imperfect in Tohono O’odham is marked by deleting the final segment of the perfect form (má:k → má: ‘giving’). This is analyzed by assuming that the imperfect is a floating moraic suffix which attracts the final consonant of the stem. Since this floating mora cannot be prosodically realized (similar to the floating syllable of a movement gap), this causes the consonant to disappear.

With this view of deletion in mind, I argue that we can view the first step of contraction as being the result of two distinct underlying representations. To be precise, *want* may optionally have a final floating mora. Given high-ranked constraints, the final /t/ will attach to this mora, later becoming invisible when it is removed by Stray Erasure. This deletion of /t/ feeds the rule in (27b).



The assumption that deletion is triggered by a floating mora can then account for why, when ‘contracting *want*’ is adjacent to a movement gap, contraction is no longer possible. The mora prefers to attach to the floating syllable and is therefore deleted along with it. A movement gap therefore removes the trigger

for final word-final /t/-deletion from the representation. A potential benefit of this view is that it defines the relatively small class of contracting verbs in terms having special underlying forms and can thereby avoid certain problems associated with a more general rule of *to*-contraction (see Pullum 1997).

7. Conclusion

In this paper, I have presented several cases in which a movement gap can have a reductive phonological effect on its neighbouring phonological context. I have suggested that this follows if movement gaps correspond to a defective representation (a floating syllable node) that can trigger reassociation of floating material only. Material that is already associated at the phrase/sentence-level will be shielded from such effects, potentially accounting for their rarity.

Of course, these remain rather speculative observations at this point. There are several issues to work out still, including how exactly we arrive at this phonological representation of the gap and the theoretical consequences of this (e.g. Trace Theory vs. the Copy Theory of Movement). What these observations hopefully illustrate, however, is that gaps derived by displacement should be treated as representationally distinct from the moved phrase.

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