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Farewell to strict directionality: evidence from English*

0 Introduction

This paper is couched in the framework of Strict CV phonology, initiated by Lowenstamm (1996) and developed in various other works, e.g., in Lowenstamm (1999), Dienes & Szigetvári (1999), Csides (2001), Ségéral & Scheer (1999/2001), etc. It must be emphasised, though, that Strict CV phonology is a radical offspring of Government Phonology (GP), initiated by Kaye et al. (1985, 1990). The theory was further developed and applied to a massive number of languages by—among others—Harris (1994, 1997), Harris & Gussmann (1998), Brockhaus (1995), Törkenczy (1992), Cyran (1997), Polgárdi (1998), etc.

§1 introduces the algorithm by which phonological government is to be calculated and puts forward the proposal of bidirectionality. **§2** introduces and discusses Balogné (2002), while **§3** offers an alternative treatment of the distribution of flapping, aspiration and glottaling in terms of bidirectional government. The main purpose of this paper is to question the principles of strict directionality and strict adjacency of GP, and to provide evidence against these long-standing notions. **§4** concludes the paper summing the proposals.

1 Bidirectional government in phonology

This paper develops the notion of licensed government and addresses the issue of why there is no consonant lenition word-initially in English and possibly in a host of other languages.[1] This task will be carried out through a case study of the distribution of flapped versus aspirated /t/ in General American (GA). Lack of space prevents me from presenting the theoretical background leading up to the proposals put forth in this paper. The relevant background may be acquired from the literature given in the introduction above (and the references therein). The major claims of the paper are given in (1) and (2) below.

(1) **Government in phonology**[2]
Government directly affecting melodic complexity takes place at the level of

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[1] It is a phonological commonplace that the word-initial site is less likely to give rise to consonant lenition.

[2] As the discussion unfolds it will become clear that there is no point in making a distinction between metrical government and proper government since the only difference between the two types is that the target of the former is a contentful vocalic position, while the target of the latter is an empty vocalic position. There will only be a single generalised network of governing governing relations, where government is bidirectional including its metrical

the foot. In a trochaic stress system the stressed vowel governs the farthest contentful vocalic position to its right within the foot silencing it relatively in the form of vowel reduction and thereby providing it with governing licence. The government licensed contentful vocalic position then governs the farthest contentful vocalic position to the opposite direction within the foot. This process lasts until all contentful vocalic positions are incorporated into the metrical hierarchy and may be referred to as METRICAL GOVERNMENT. If no further contentful vocalic positions are available, government targets empty vocalic positions in either direction keeping them absolutely silent in the form of syncope, or static emptiness. If no empty vocalic positions are available, government by the contentful vocalic position targets empty or contentful consonantal positions by default. This latter facet of the generalised notion of government may be referred to as PROPER GOVERNMENT. Government in phonology is bidirectional.

(2) Governors must be licensed to govern by their prosodically dominant peers.

For further details of the theoretical assumptions made here, cf. Csides (2002).

2 The beginning of the word — Balogné (2002)

Consider the data below taken from Balogné (2002 : 2).

(3) **GA Flapping—data set 1**

a. [t^h]: Tom, tomorrow   b. [ɾ]: atom, competitive

The data in (3) illustrate the phenomenon of GA flapping whereby word-initial and foot-initial /t/'s get aspirated whereas foot-internal intervocalic /t/'s undergo flapping. According to Lowenstamm (1999), the introduction of syllabic constituency to replace traditional boundary markers and conjunctions has no success when facing a process like GA flapping. This is due to the fact that all the /t/'s are syllable onsets in (3), yet the phonology identifies them as two different sites with respect to lenition. It is furthermore obvious that a non-derivational[3] theory coupled with a non-hierarchical representational framework has access neither to rule ordering nor to resyllabification. In order to avoid making reference to either prosodic hierarchy or morphological boundary markers, Lowenstamm (1999) introduces the empty "cv" unit at the beginning of the word, which is supposed to

manifestation. Furthermore, governing relations will also be established beyond the foot-level, when more than a single foot is involved in the representation of an utterance.

[3] Non-derivational in the sense that we do not derive surface representations from an underlying one through a series of rules. As it will turn out later in the paper, derivation is used in a different sense here. Namely, the term is used in the sense of "deriving the representation of a string from the representation of its components determined by syntactic structure."

replace the traditional # boundary marker.[4] As a result, not only word-medial but also word-initial empty vocalic positions have to be silenced. It must be mentioned in passing, however, that the vocalic part of the word-initial empty cv unit will never be the site of vowel–zero alternation.[5] Note that the presence of word-initial empty cv units comes handy in capturing a host of phonological generalisations including phonotactic restrictions. Thus—according to Scheer (1998), for example—a single consonant and an onset cluster fall out as natural word-beginning consonantal sequences whereas a bogus cluster is automatically disqualified. Consider the representations in (4) below.

(4) a. *many* [meni]

c	v	C	←	V	C	V
		m		e	n	i

b. *trap* [træp]

c	v	C	v	C	←	V	C	v
		[t		r]		æ	p	

c. *#[tpa]

c	v	C	v	C	←	V
		t		p		a

In (4a) the vocalic position dominating [e] silences the empty vocalic position of the word-initial empty cv unit. As a result, the word-initial consonantal position is licensed and ungoverned, a configuration under which a consonantal position is said to be strong. In this framework the fact that words can begin with a single consonant is connected precisely to the fact that the full-fledged vocalic position can properly govern the initial vocalic position of the empty cv unit thereby silencing it. According to Scheer (1998), a similar situation obtains in (4b), where the word-initial consonant cluster is such that it forms a closed domain (enclosed in square brackets), and therefore government may again silence the empty vocalic position of the word-initial cv site.[6] In (4c), however, the two members of the bogus cluster cannot form a closed domain due to lack of any phonotactic dependencies. The only available means to keep the vocalic position in between the two consonants mute is proper government by the vocalic position dominating [a]. Proper government will thus never reach the initial empty vocalic position, and as a result, the prediction is that bogus clusters (and coda–onset clusters for that matter)[7] will never be able to surface word-initially.

The fact that word-initial consonants are less likely to lenite is connected to government, licensing and the existence of the word-initial empty cv unit by Balogné (2002 : 7) among others. She illustrates her observations with the data under (5).

[4] The fact that it is no longer morphological material but rather phonological is manifest in the fact that it has phonetic content. The c part of the empty cv unit is inherently silent, whereas its vocalic part is inherently loud requiring proper government to be silenced.

[5] This is only true if we do not regard alternation resulting from concatenation and cliticization as true vowel–zero alternation.

[6] According to Scheer, typical onset-like (obstruent plus liquid) clusters constitute a closed domain immune to outside government. Consequently, proper government may skip the entire phonotactic domain, striking the initial empty vocalic position and silencing it. For the details cf. Scheer (1998).

[7] In Scheer (1998) coda–onset clusters cannot form a closed domain, and as a result, the empty vocalic position inside a coda–onset cluster may only be silenced by proper government.

(5) a. (atom) b. (at)(omic) c. vT(om)[8]

a. V C⇐V C
æ t ə m

b. V C⇐V C V C
ə t ɒ m ɪ k

c. v C⇐V C
t ɒ m

In (5a) the foot-internal consonant is both governed (indicated by the single arrow) and licensed (indicated by the double arrow) and thus is expected to undergo consonant lenition according to the theory of Dienes & Szigetvári (1999). In (5b) and (5c) the consonantal position dominating the melody represented as /t/ finds itself in a strong phonological position. In the former case, because the stressed vocalic position (initiating a stress domain) is unable to properly govern (right-to-left) and thus the position remains licensed and ungoverned. In the latter case, although the vowel is stressed again, it is able to properly govern the word-initial empty vocalic position. The idea of the theory of VC phonology that Balogné seems to adopt here is that the word-initial empty vocalic position followed by the word-initial consonantal position does not constitute a stress domain, hence the lack of parentheses around vT in (5c). Recall that if it constituted a stress domain, the vocalic position dominating [ɒ] would not be able to govern the initial empty vocalic site, since such a move would run against the Antipenetration Constraint (AC) in the framework of Dienes & Szigetvári (1999). Furthermore, it remains a mystery why the first VC unit of *atomic* (5b) should constitute a stress domain when it does not have a stressed vocalic position. According to the theory of Dienes & Szigetvári (1999), a stress domain starts with a stressed vowel and extends up to the next stressed vowel. It seems then that there should be no brackets round the sequence *at* in (5b) since it does not constitute a stress-domain, and consequently the stressed vocalic position dominating [ɒ] should be able to govern into it quite similarly to (5c). These complications all arise as a result of two assumptions: first that consonant-initial words begin with an empty vocalic position, and second that government is unidirectional.

Notice the logical consequences of the proposal: at first sight it would seem that it is only unstressed vowels that have the capacity to properly govern (5a), whereas stressed ones are deprived of this capacity (5b). Turning to (5c), however, it turns out that a stressed vowel is also a proper governor if not preceded by a stress domain. This means that a stressed vowel can indeed strike out of its own stress domain. but not into a neighbouring one. To visualise matters, two brackets (an opening and a closing one) are needed to constitute a buffer to government. Furnishing stressed vocalic positions with right-to-left proper governing capacity is necessary in this framework, once initial empty vocalic positions are postulated before consonant-initial words. Furthermore, Balogné (2002 : 8ff) illustrates the shortcomings of the AC by pointing out that stress-sensitivity of flapping vanishes

[8] Note that Balogné (2002 : 7) represents *Tom* as (vTom). This representation, however, is not fully consistent with the framework she is describing. Since according to Szigetvári (1999), a stress domain starts with the stressed vowel and extends up to the next stressed vowel not including the latter, I fail to see why the entire word *Tom* should be bracketed. Therefore, I have chosen to represent *Tom* as vT(om).

once we extend our investigation beyond the word domain. The data in (6) illustrate that word-final /t/'s undergo tapping regardless of whether the next word begins with a stressed or an unstressed vowel. Moreover, word-initial /t/'s always remain strong, i.e., aspirated and word-final /t/'s undergo glottalization when they are followed by either a consonant-initial word or a pause. Consider the data taken from Balogné (2002 : 8).

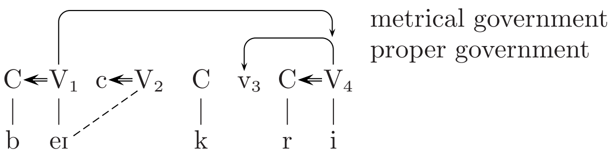
(6) **GA flapping—data set 2: cross word effects**

a. hi[ɾ] Ánn, hi[ɾ] Aníta, hi[t^ʔ] me   b. grow [t^h]omátoes
c. [t^h]íssue, a[ɾ] íssue   d. wai[ɾ] a mínute

On the basis of the data in (6), Balogné points out that Dienes and Szigetvári's (1999) theory is unable to capture the fact that the stress sensitivity of flapping disappears beyond the word domain. She goes on to suggest that it is possible to capture the differences between word-internal and cross-word flapping by assuming that government responsible for flapping (i.e., proper government) operates between melodies. While word internally the target /t/ and the following vowel are adjacent both melodically and skeletally, this does not hold of a word-final /t/ and a vowel initiating the next word. In the latter case the boundary marker prevents the two segments from being adjacent on the CV tier.

Balogné's second suggestion is that stressed vowels—since they seem to support the melodic make-up of a preceding consonant—prefer licensing to government, i.e., if both conditions are met they choose to license. On the other hand, unstressed vowels are more prone to damage the consonant in their CV units and therefore they prefer to govern. In Csides (2000), I connected this skewed propensity of stressed versus unstressed vowels to govern vis-à-vis license to the principle of government licensing proposed originally by Charette (1990) for consonantal governing relations. The application of the idea to proper government was formulated in (2) above: recall that for a vocalic position to be able to properly govern from right to left it must receive licence to do so from the dominant vocalic position within the foot. In other words, unstressed vowels acquire the capacity of being able to govern by virtue of being preceded by a stressed vowel within the same foot. The idea is depicted in (7) below.

(7) *bakery* [beɪkəri/beɪkri]



The representation in (7) shows how metrical government grants governing licence to the final unstressed vocalic position, so that it can properly govern the position dominating the alternating schwa inside the foot. The concept of government licensing of proper governors derives the same effects as the ANTIPENETRATION CONSTRAINT in Szigetvári (1999) but from an already existing principle of grammar — that of government licensing — that has been suggested earlier for entirely different purposes. Furthermore, the representation yields an answer to the question of why vowels do not shorten before a syncope site. Naturally, if V_4 has to control V_3, then the empty V_2 remains unaffected by proper government. An ungoverned empty vocalic position, however, is illegal and therefore an alternative repair strategy is required to save the situation. This strategy manifests itself in the form of melody spreading from V_1 onto V_2. In order to account for the data in (6), Balogné (2002 : 9) proposes the constraint in (8).

(8) A consonant (including both its melodic and skeletal position) cannot be simultaneously governed and licensed by the same vowel.

The representations in (9) illustrate how Balogné (2002 : 9) chooses to derive the cross-word lenition effect from the observations mentioned above.

(9) a. *átom*

$c \leftarrow V_1 \quad C \quad V_2 \quad C \quad v_3$

$\leftarrow$ æ t $\leftarrow$ ə m

b. *atómic*

$c \leftarrow V_1 \quad C \leftarrow V_2 \quad C \quad V_3 \quad C \quad v_4$

$\leftarrow$ ə t ɒ m $\leftarrow$ ɪ k

According to the proposal, licensing takes place on the skeleton, while government is a relation between melodies. The word-initial vocalic position dominating /æ/ in (9a) is stressed, so it will first license the preceding empty consonantal position. Since that consonantal position is empty, i.e., it does not interfere with possible relations contracted on the melodic tier, the vowel has the ability to govern some other consonantal material at the melodic level if one becomes available through concatenation. The second vowel, however, being unstressed, will first discharge its governing potential on the consonantal melody represented by /t/, but having done so, it loses its opportunity to do anything else. This is due to the fact that it could only discharge its licensing potential on the preceding consonantal position, which it also governs. This would amount to a violation of (8) above.

In (9b), however, the same word-initial vowel is not stressed, thus — according to Balogné (2002 : 9) — it tries to govern first, which will not materialise until the word is put into a context by concatenation with a consonant final word, e.g., *hit atomic elements.* In that case, Balogné claims, government can reach the underlined /t/ and thus it surfaces as a tap. At the same time, the initial empty consonantal position gets its share of licensing since this will not violate (8). The stressed vowel V_2 in (9b), on the other hand, will license the /t/ making it aspirated, but cannot simultaneously govern it in accordance with (8), consequently its governing power will remain unexploited.

Consider now the data in (10) below, which shows that function words behave differently from major categories.

(10) **GA flapping — data set 3** (Balogné 2002 : 10)

a. I want you [ɾ]o help me. b. Don't lie [ɾ]o me.
c. [tʰ]o tell the truth d. [tʰ]omorrow e. see you [ɾ]omorrow

The initial /t/ in *to* is only aspirated when at the beginning of the utterance (10c), otherwise it is flapped when it is preceded by a vowel-final word and therefore appears in the conditioning environment, (10a–b). The flapping cases are accounted for in the framework sketched out by Balogné in the following manner: she proposes that Lowenstamm's empty cv boundary marker only characterises lexical words to the exclusion of function words. Consequently, so the argument goes, words like *to* lack it and that is why ... *lie to*... creates exactly the same context for /t/ as *atom* does. Balogné (2002 : 10) illustrates this situation as in (11) below.

(11) a. *atom*

$$\begin{array}{ccccc} c \leftarrow V_1 & C & V_2 & C & v_3 \\ | & | & | & | & \\ \leftarrow \text{æ} & \text{t} \leftarrow & \text{ə} & \text{m} & \end{array}$$

b. *lie to*

$$\begin{array}{ccccc} \ldots V & c & V & C & V \\ | & & | & | & | \\ \text{a} & & \text{ɪ} & \text{t} \leftarrow & \text{ə} \end{array}$$

The question as to how the boundary marker appears to the left of function words when they appear at the beginning of an utterance (10c) now arises. According to Balogné, there are two ways of explaining away this situation. Either—as opposed to what Lowenstamm (1999) claims—there is an empty cv unit at the beginning of all types of words, which is deleted in certain environments, or the empty cv unit is indeed absent from before function words and is inserted only utterance initially.[9]

Notice that Balogné's (2002) account of the word-initial site needs to be revised for the following three reasons. First, Balogné clearly assumes a temporal sequence of events initiated by vocalic positions, claiming that stressed vowels are prime licensors, which means that only after having attempted to discharge their licensing potential can they govern. In the case of unstressed vowels the opposite situation obtains, viz., they seem to be prime governors, that is first they try to govern, and only after having attempted to do so are they capable of licensing. It is important to emphasise that her analysis crucially hinges on this distinction. Furthermore, government is assumed to be a relation contracted along the melodic tier, as opposed to licensing, which takes effect on the skeleton. On these assumptions, however, it is difficult to see why (10d) and (10e) should behave differently. More specifically, I do not see why — under the framework outlined above — the initial consonant in *tomorrow* (10d) should not flap. This is because the initial vowel is unstressed in *tomorrow*, which Balogné claims to be a prime governor, i.e., it must first try to govern, and only after having done so should it try to discharge its licensing potential. It comes as a surprise then that the unstressed vowel in the first syllable of *tomorrow* chooses exceptionally to skip the intervening melody of the word-initial /t/, and govern the empty vocalic position of the postulated empty cv unit. What we expect, according to the sketch of the theory, is that the first nonempty (unstressed) vocalic position should indeed govern first, and the target should be the initial consonantal melody /t/, as government takes place on the melodic tier. This position—being governed—cannot be licensed, since this is

[9] Note that in Balogné's framework — as she also points out — a VC analysis fails in either case. This is because in consonant-initial words it is the vocalic position of the first VC unit that functions as a boundary marker (i.e., it absorbs the governing potential of the following nonempty vocalic position). It can never be inserted or deleted, however, since Szigetvári (1999) claims VC units to be inseparable.

excluded by (8) in Balogné's framework. The resulting configuration thus should be one in which the initial consonant of *tomorrow* is governed and unlicensed, and as a result, undergoes flapping *[ɾəˈmɒrəʊ]. This prediction is not borne out, as is illustrated by (10d). Notice furthermore that this prediction is borne out when the same lexical item follows a vowel-final word as in (10e). It is fairly obvious that the conditioning factor has to be searched for in the context preceding the /t/ that shows this anomalous behaviour.

Second, if we accept the hypothesis in (8) above, namely that a consonantal position cannot be simultaneously governed and licensed by the same vocalic position, we end up with a configuration in which foot-internal onset consonants will be unlicensed and governed, cf. (9a) above. However, Balogné (2002 : 6–7) subscribes to the basic tenets of Dienes and Szigetvári's (1999) theory, in which unlicensed and governed consonants should undergo both consonantal and vocalic consonant lenition, i.e., both types of consonant lenition phenomena should be attested in this context. It is worth mentioning here that although Dienes and Szigetvári's theory does not cater for the possibility of consonantal consonant lenition[10] in foot-internal intervocalic position, Harris (1994 : 195) indeed mentions such a system under the heading "glottaling (wide distribution)".

The third remark is a more general theoretical one, and refers to the requirement of locality in strict CV phonology. It has become a received wisdom amongst CV phonologists that while structural relations are established on the CV skeleton, maximally one position (that of the opposing category) may be skipped, cf. the case of proper government.[11] In the case of *hit Aníta*, e.g., the two positions, an empty vocalic position followed by the initial empty consonantal position in the next word will have to be skipped, which represents a departure from the generally recognized notion of locality constraints. Consider to this effect the representation in (12) below.

(12) *hit Aníta*

```
C⇠V  C  v  c⇠V  C⇠V  c  V  C  V
|  |  |        |  |  |        |  |
h  ɪ  t←———————ə  n  i        t←—ə
```

(12) shows that locality—in the sense introduced above—is lost at the cross-word site above, even if governor and governee are adjacent on the melodic tier. This is not necessarily an unwelcome situation, and I will argue that locality in the traditional sense is simply untenable.

These three observations lead us to modify the analysis proposed by Balogné (2002), incorporating at the same time her insight that governing relations may indeed be established on the melodic tier, and also that a consonantal position may not be governed and licensed by the same vocalic position simultaneously.

[10] Recall that this means loss of place contrast without spirantisation or voicing, e.g., glottalization.

[11] An exception to this is the case of a closed domain Scheer (1998), where an entire CvC sequence may be skipped to silence the word initial empty vocalic position. Cf. also Csides (2000) for a similar approach to both onset and coda clusters.

3 Licence to properly govern

In Csides (2002) I noted that lack of pretonic syncope and absence of foot-initial lenition may all be derived from a fundamental underlying property of grammar, namely, the complementary governing potential of different types of vocalic positions. The upshot of the algorithm in (1) was that in any case, a properly governing vocalic position must receive licence to govern from its prosodically dominant peer within the foot. In other words, it is the recessive vocalic positions that are able to properly govern in the traditional sense, but only by virtue of receiving licence to do so from their dominant fellow within the foot. This potential of the government licensed vocalic position is depleted on an empty consonantal position in the case of long vowels and diphthongs, and is phonetically manifested in the smooth transition from the first vocalic position onto the second in this type of cluster, cf. also Szigetvári (1999).

Finally, it must be noted that if these observations are unified with GOVERNMENT LICENSING (Charette 1990) the following generalization can be made about phonological strings.

(13) **Government Licensing**
All governors must be licensed to govern except the ultimate head of the domain.

Let us consider how this proposal can be extended to cover lack of word-initial lenition and the distribution of flapped versus aspirated /t/. As far as word-internal contexts are concerned, we seem to be at ease with the proposal in that proper governors must be licensed to govern by their prosodically dominant neighbours within the foot. The data in (3) above are repeated here as (14) for convenience.

(14) **GA Flapping—data set 1:** a. [tʰ]: Tom, tomorrow b. [ɾ]: atom, competitive

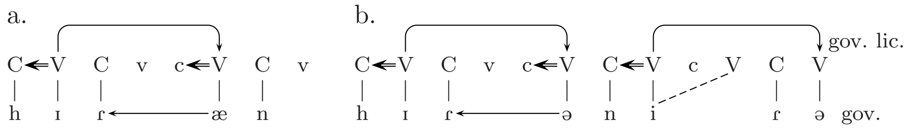
According to the proposal of licensed proper government, it is easy to see why there is no lenition in (14a). In *Tom*, the stressed vocalic position dominating /ɒ/ can govern only left-to-right (metrical government), and can only license the word-initial /t/. In *tomorrow*, although the first vowel is unstressed, it has no preceding dominant pal, which could grant it government-licence and therefore the first /t/ in *tomorrow* can only be licensed but not governed. In (14b) all the three /t/'s undergo flapping. This is because in (14b) all the three /t/'s are followed by an unstressed vowel, all of them receiving government-licence from a preceding stressed vocalic position, the head of the foot. If, however, we extend our investigation beyond the word domain, and examine the data in (6), repeated here as (15) for convenience, we have to modify our proposal, relaxing the requirement that the government licensed proper governor should be a recessive position in a trochaic foot across words, too.

(15) **GA flapping: cross word effects**

a. hi[ɾ] Ánn, hi[ɾ] Aníta, hi[tˀ] me
b. grow [tʰ]omátoes
c. a [tʰ]íssue, a[ɾ] íssue
d. wai[ɾ] a mínute

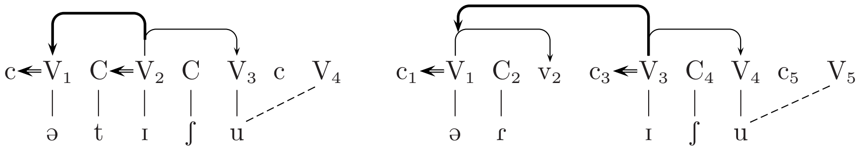
Examining the first two examples in (15a), we immediately notice that stressed vowels also seem to be able to govern but only in a cross-word context. Consider the representation in (16) below.

(16) a. b.



The representations in (16) illustrate government licensing across the word, and subsequent government on the melodic tier. It must also be added that we do not postulate an empty cv unit at the beginning of words. We assume that phonological words begin with a consonantal position, even if that position happens to be melodically empty. This issue will not be investigated in this paper. Note also that (16) may give the false impression that government-licensing—due to metrical government—is always a left-to-right relationship. There is, however, no reason to maintain this assumption since it would clearly upset the uniform interpretation of government in (16a), where—although post-lexically—the governed vocalic position would be metrically more prominent that its governor. This is clearly undesirable and completely unnecessary in the light of the bidirectionality hypothesis. We will, therefore, propose an alternative analysis to (16) in (20) below exploiting a distinction between relations contracted in the lexicon on the one hand and postlexically on the other. In order to anticipate further discussion, consider now the items in (15c) represented as (17a) and (17b) below respectively, incorporating the hypothesis of bidirectional government on the one hand, and lexical versus postlexical governing relations on the other.[12]

(17) a. *a* [tʰ]*issue* b. *a*[ɾ] *issue*



In (17a) the stressed vocalic position dominating [ɪ] incorporates the first vocalic position of the word-final long [uː] into the metrical hierarchy. Since the second vocalic position of the long vowel is lexically empty and ungoverned, a repair strategy is required to remedy the illegal situation in the form of spreading the melody of [uː] from V_3 into V_4. Even if the first (stressed) vocalic position could be government licensed by the vocalic position of the indefinite article, the vocalic position dominating [ɪ] would be a prime licensor since it is stressed. Since this form cannot be treated as a lexicalized sequence, the word *tissue* will leave the lexicon as an individual item whose initial stressed vowel (not receiving licence to govern in the lexicon from a preceding contentful vocalic position) has by that time

[12] The bold lines appearing in the representations of (17) indicate governing relations contracted postlexically.

licensed the initial consonantal position. As a result, the word-initial consonantal position dominating the melody of /t/ leaves the lexicon as a licensed position, and the initial /t/ cannot be governed by the following vocalic position, even if that vocalic position would be able to receive licence to govern through concatenation. This is due to the fact that the initial /t/ is already licensed, and thus cannot be affected by government, since this would violate (8).

Notice furthermore that since the sequence *a tissue* may not be treated as a lexicalised form, any governing/licensing relation may only be established between article and noun postlexically. Postlexically, however, it will be the first vocalic position of the noun (V_2) that will govern the vocalic position of the article (V_1) since the former takes up a more prominent position in the metrical hierarchy. The article—being a sub-minimal form and lacking stress—erects no governing relation in the lexicon. The (V_1) vocalic position of the indefinite article, however, may not properly govern the intervening consonantal position between V_1 and V_2 since the ultimate source of this proper government would be V_2, which has already licensed this consonantal position in the lexicon. Proper government is thus blocked here, since it would lead to a violation of (8) in this extended sense.

In (17b) this problem does not arise, since the skeletal position which is lexically licensed (c_3), and the skeletal position dominating the melody to be governed (C_2) are not identical. As a result, government, i.e., flapping can take place. Moreover, the intervening empty vocalic position v_2 may also be silenced by proper government coming this time from the contentful vocalic position (V_1) on the left. This latter relationship—as we shall see—is already present in the lexicon.

The item in (15d) is also easy to tackle. The indefinite article between the verb and the noun will be unstressed, and it will form the recessive position of a binary trochaic foot with the preceding verb (weɪɾə). Being unstressed, the second vowel will be a prime governor hitting the final consonant of *wait* on the melodic tier. The position dominating this consonant will escape licensing due to (8). Notice that this form may well be treated as a lexicalized item, i.e., the sequence *wait a* may form a trochaic foot established in the lexicon. However, even if the concept of lexicalization is eschewed, the distinction between lexical and postlexical government, in tandem with the uniformity principle provide an answer to the question of why encliticisation of the indefinite article to the preceding verb is possible in this case. We will return to this question presently. Consider now the items in (10) repeated as (18) below for ease of reference.

(18) **GA flapping—data set 3** (Balogné 2002 : 10)

a. I want you [ɾ]o help me.	b. Don't lie [ɾ]o me.	
c. [t^h]o tell the truth	d. [t^h]omorrow	e. see you [ɾ]omorrow

(18a) and (18b) work exactly like (15d): (juːɾə) and (laɪɾə) form binary trochaic feet in connected speech where flapping will take place according to the mechanism depicted above. Notice that function words like articles, prepositions, infinitival particles leave the lexicon without stress—and hence a governing relation—and remain stressless in the connected text. Consequently they are prone to cliticisation and end up glued to the preceding lexical item. In (18c) and (18d) both the vowel of *to* and the first vowel of *tomorrow* are unstressed and hence they are prime governors. According to the system of Balogné, they should indeed govern the melody of the preceding position once government proceeds on the melodic tier. This means that her system predicts lenition in both (18c) and (18d), a prediction which is not borne out by the data. Notice, however, that neither in (18c) nor in (18d) is the unstressed vowel preceded by another vowel, which could provide the necessary licence to govern. Thus, neither the vocalic position of *to*, nor the first vocalic position of *tomorrow* is able to govern, and as a result, they are allowed to discharge their licensing potential on the preceding consonantal position. These consonantal positions in turn become licensed and ungoverned, i.e., strong, the phonetic manifestation of which is aspiration. The remaining two items are (15b) and (18e), repeated below as (19a) and (19b) respectively.

(19) a. grow [t^h]omátoes b. see you [ɾ]omorrow

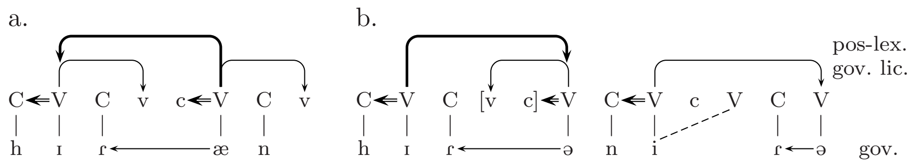
These two items constitute a challenge to theories attempting to account for the distribution of flapped versus aspirated /t/. While (19b) is easily accounted for in the framework we have proposed, (19a) sneaks out of analyses, since the first vocalic position of *tomatoes* is unstressed, and thus counts as a prime governor provided that it is licensed to govern. We have also seen that governing licence may also be provided postlexically, besides the fact that stressed vowels are unlicensed governors, cf. (17b). As a result, we rightfully expect governing licence to be assigned to the first vocalic position of *tomatoes*. However, as shown by the transcription, aspiration takes place. Notice, however, that (19b) may be treated as a lexicalised sequence. In this case the government licensed unstressed vocalic position in the first syllable of *tomorrow* will be able to perform its primary role as a governor by flapping the initial consonant.

In (19a) the unstressed vowel in the initial syllable of *tomatoes* cannot perform its primary role as a governor although it seems that it may receive governing licence postlexically. However, by the time the two items are concatenated, the initial /t/ of this word will have been licensed in the lexicon. This is because—*grow tomatoes* being a non-lexicalized item—*tomatoes* leaves the lexicon as an individual item with no contentful vocalic position preceding the unstressed vowel in the initial syllable of the word. As a result, the word-initial /t/ escapes government (hence flapping) in the lexicon. Remaining ungoverned, however, it can be licensed since this will not violate (8), and the unstressed vocalic position in the initial syllable of *tomatoes* will have the chance to perform its secondary role of a licensor. It is clear from this discussion that the crucial factor here is that a consonantal position cannot be licensed and governed by the same vocalic position simultaneously. This is so even if one of these forces affects the consonant in the lexicon, while the other becomes available postlexically. In such cases the force becoming available later is blocked. This is a case of phonological blocking.

As a consequence of the assumptions made above, the data in (18) are all straightforwardly accounted for. All we need to add with respect to (18a–c) is that since function words do not carry a stressed vocalic position when they leave the lexicon, they need to be incorporated into a trochaic foot. A preceding stressed vowel will provide governing licence to the vocalic position of the infinitival particle, preposition, etc. so that the latter position can properly govern. Note that the sequences [juːɾə] and [laɪɾə] are best treated as strings involving a host and a clitic.

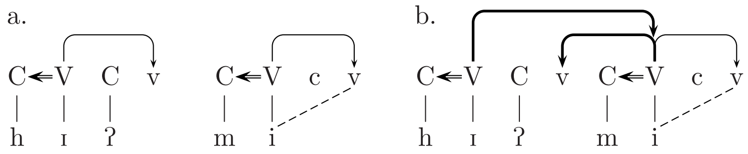
Under the proposal put forward here, however, some of the items in (15) seem, at first sight, to be problematic. The string in (15d) poses no problem since *wait a minute* can be treated as a lexicalized form and (15b) has also been covered above assuming that *grow tomatoes* is a non-lexicalized form. As far as (15c) is concerned, we may again refer the case of *at issue* to lexicalization by assuming that this case is different from *a tissue* in that the latter is not at all lexicalized. *Tissue* leaves the lexicon with a licensed initial consonant, which resists any later government. What needs to be revisited is the items in (15a), namely, *hit Ánn* and *hit Aníta*. The first one of these seems at first sight to be more problematic, since both *hit Ánn* and *hit Aníta* are susceptible to flapping. However, as we have seen above in connection with the data in (18) and (19), in non-lexicalized forms such as *hit Ánn* and *hit Aníta* both vowel-initial words, *Ánn* and *Aníta* contain a licensed empty consonantal position on leaving the lexicon. This licensed empty consonantal position cannot be affected by proper government emanating from the government licensed first vocalic position of *Aníta*— that may receive governing licence postlexically— since it would run against (8). Moreover, since this type of government proceeds on the melodic tier, this question does not even arise. Since the initial consonantal position is empty, proper government may reach the word-final consonant of *hit* on the melodic tier causing flapping. This does not violate (8) since it is different consonantal positions that are licensed and governed respectively by the same vocalic position. By way of revision, consider the representation of the two concatenated strings once again as (20) below, which already incorporates the hypothesis of bidirectional government. Notice that postlexical government-licensing is not restricted to apply within the foot and it turns out that government is bidirectional regardless of whether it manifests itself in the form of proper government or metrical government, cf. (20) below.

(20)

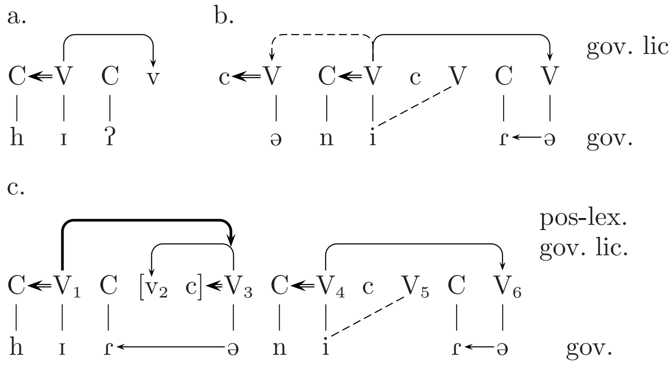


Notice that in the framework we are advocating here neither metrical nor proper government respect locality in the traditional sense. Although the parties entering into a proper governing relation are adjacent on the melodic tier, they may be separated by more than one point on the skeleton. Furthermore, metrical government incorporating contentful vocalic positions into the metrical hierarchy may skip quite a number of skeletal positions, since stressed vocalic positions, for example, seem to target the farthest contentful vocalic position first. Only after having "killed off" all the contentful vocalic positions can government target vocalic positions devoid of melodic content. Consider in connection with this the algorithm provided in (1) above. Furthermore, examining (20b), it becomes obvious that *hit* and *Anita* leave the lexicon as shown in (21) below.

(22)



(21)



Notice that both items leave the lexicon containing a binary trochaic foot. The first vocalic position of *Anita* is left unattended by the metrical structure and receives proper treatment only by default. This default mechanism consists in implicating all degenerate material into metrical structure during the course of phonetic interpretation. This relationship is indicated by the dashed line in (21b), and is only established when *Anita* is uttered in isolation. This default mechanism is not necessarily invoked, since phonology strives to maintain uniform structure wherever possible, in accordance with the uniformity principle. Since the governing relationship indicated by the dashed line is treated as a structural freak invoked only as a rescue mechanism, post-lexically it is shunned by incorporating the initial vocalic position of *Anita* into the degenerate foot containing the contentful (V_1) and the empty (v_2) vocalic position lexically. This does not come as a surprise since a degenerate foot, as is shown by its name, is also tacitly assumed to be a structural torso. The net result of concatenation is depicted in (21c), whereby the governing relation initiated by the vocalic position of *hit* embraces the first vocalic position of *Anita* incorporating the latter into a fully fledged trochaic foot. The government licensed V_3 will then govern V_2 and the bracketed sequence remains uninterpreted. Government proceeding on the melodic tier encounters the melody of the word-final /t/ in *hit*, and flapping takes place. Notice furthermore that the representation of *hit* provided in (21a) above is not exactly that of lexical representation but already shows the result of phonetic interpretation when the word is uttered in isolation. The lexical representation of this item, of course, contains a /t/ and not a glottal stop.

The only item that has been left unattended is the third example in (15a), i.e., *hit me*, pronounced as *hi*[tˀ] *me*. The machinery that we have proposed above raises a number of questions in connection with this sequence. Consider the representation in (22) below.

The representations in (22a) show how the two items are stored in the lexicon, while (22b) shows the result of concatenation. Since *hit me* is a phrasal category, we would expect the stressed vocalic position of the second item to serve as the ultimate head of the resulting domain. However, since the pronoun *me* is a function word, it lacks lexical stress, and behaves like a clitic, it cannot function as the ultimate head of the domain. Notice that the empty vocalic position — occurring at the end of *hit* — is controlled by government, in any case. Therefore, it loses its licensing potential, leaving the preceding /t/ unlicensed, which in turn may in both cases be realised as a glottal stop, cf. also Szigetvári (1999). A careful inspection of (22b) also answers the question of why /t/ may not be flapped in *hit me*. Although the first vocalic position of *me* is able to properly govern from right-to-left, it may not target the immediately preceding consonant, since it is already licensed. Furthermore, right-to-left government between a vocalic position and a consonantal position takes place on the melodic tier, and therefore, such a relationship would never reach the final /t/ of *hit*, since the intervening melody of /m/ blocks the way.

The above discussion shows that the situation is more complex than it is suggested in Balogné (2002). The representation in (22b) above, for example, raises the question of what will ultimately silence the empty vocalic position at the end of *hit*. If proper government proceeds exclusively on the melodic tier, how can it ever access an empty vocalic position, lacking melody whatsoever. Furthermore, if it is not proper government that silences empty vocalic positions, then what will cater for the silence of these marked skeletal points? The partially modified representations in (16) incorporating the notion of government licensing raise the same questions.

In order to provide for the silence of empty vocalic positions, and to suggest a feasible answer to the distribution of flapping in General American at the same time, we need a more sophisticated network of governing relations. Moreover, a proper distinction needs to be made between relations contracted in the lexicon on the one hand and postlexically on the other.

The discussion presented above leads to the conclusion that the adoption of the bidirectionality hypothesis in tandem with the uniformity principle is beneficial for the understanding of the distribution of flapping in General American. Notice also that even the concept of lexicalization may prove to be redundant in capturing the exact distribution of flapping vis-à-vis aspiration. From among the sequences discussed in this section only in those listed under (23) may reference be made to the concept of lexicalization in capturing the distribution of across-the-word flapping.

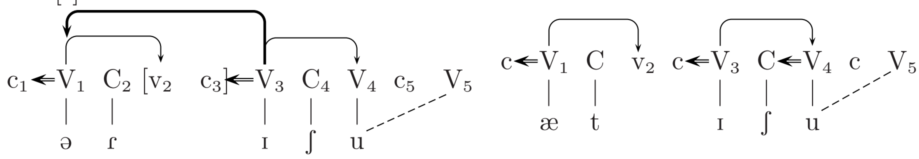
(23) a. a[ɾ] íssue b. wai[ɾ] a mínute c. see you [ɾ]omorrow

Consider furthermore the items in (24) below, whose infinitival particle in (24a), and preposition in (24b) happen to display the same clitic-like behaviour. We shall discuss the items in (23) and (24) together because they highlight the importance of the distinction to be made between governing relations contracted at the lexical versus postlexical level.

(24) a. I want you [ɾ]o help me. b. Don't lie [ɾ]o me.

The string in (23a) has been given an analysis above in (17b). Let us repeat it below as (25a) for convenience, and suppose that the lexical representation of the items comprising the string is as (25b) below.

(25) a. *a*[ɾ] *issue* b. *at* *issue*



It is fairly obvious that the right-to-left metrical governing relation—indicated by the bold arrow—may only be established postlexically, when the two items have been concatenated. This also holds of the proper governing relation between V_3 and the final consonant of *at* contracted at the melodic tier. The preposition *at* forms a degenerate foot in the lexicon, and contains a governing relation between V_1 and V_2 because it is more than a sub-minimal string. The postlexical metrical governing relation manifests itself in the form of vowel reduction—the vowel of the preposition is reduced—while proper government proceeding on the melodic tier results in tapping the final consonant of the preposition. The government licensed V_1 in (25a) properly governs empty V_2 from left to right keeping it silent. It is thus obvious that the correct phonetic interpretation may be derived in the case of (25) without resorting to the concept of lexicalization. Moreover, there are two generalisations to be captured as a result of the above analysis. These are given as (26) and (27) below.

(26) Government holding between vocalic positions is bidirectional, regardless of whether it manifests itself in the form of proper government or metrical government.

(27) Governing relations may be established in the lexicon and also postlexically.

Notice that (27) rejects one of the basic tenets of GP holding that governing relations are established in the lexicon, and as we have seen, governing relations are also contracted post-lexically. Furthermore, governing relations established by default during the phonetic interpretation of isolated lexical items are not necessarily invoked during the derivation of postlexical strings. We formulate this observation as (28) below.

(28) Governing relations established by default during the phonetic interpretation of isolated lexical items are not necessarily invoked in postlexical derivation. Degenerate feet are eschewed in favour of uniformity.[13]

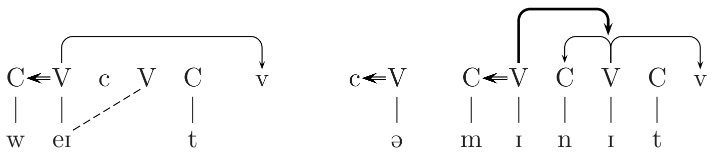
[13] "Derivation" in this framework means something totally different from its classic use in Standard Generative Phonology. As noted already above, it has nothing to do with levels

Consider now the string in (23b) whose lexical and postlexical representations are given in (30) below. Before turning to the phonological relations, consider the syntactic structure of the string in (29).

(29) $[_{\text{VP}}[_{\text{V}}\text{wait}]\ [_{\text{NP}}[_{\text{D}}\ \text{a}\ ]\ [_{\text{N}}\ \text{minute}]\ ]\ ]$

(30) a. lexical representation

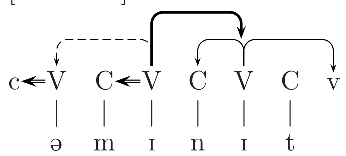
wait *a* *minute*



b. intermediate representation

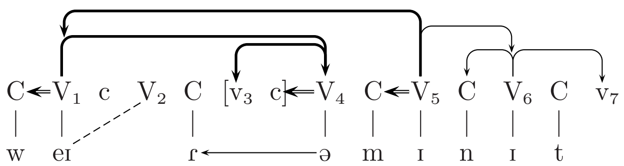
[*wait*] [*a minute*]

— same as above —



c. final representation

[*wait a minute*]



The representations in (30a) should by now be obvious. In (30b), the determiner and the noun are concatenated, and a default governing relation hits the vocalic position of the article, in order to incorporate it into the metrical hierarchy. This relationship is indicated by the dashed line in (30b). This default relation is not invoked in (30c), since its presence would upset uniformity of foot-types, and another more convenient governor vocalic position becomes available through concatenation of *wait* and *a minute*, i.e., V_1. This latter vocalic position embraces the farthest available non-empty vocalic position into its foot domain, which in turn will govern empty V_3 keeping it silent. The government licensed V_4 and the melody of /t/ at the end of *wait* are now adjacent on the melodic tier, and therefore flapping can take place. And ultimately, since *wait a minute* is a VP, the most prominent vocalic position, V_5 will incorporate the other foot head into the prosodic hierarchy.

of representation or deriving a superficial representation from a deeper one. Since all representations are fully interpretable in the framework advocated here, "derivation" means concatenating the prosodic representation of synatactic constituents into longer strings.

Note that while syntactically the verb is considered to be the head of the verb phrase, phonologically (prosodically) it is the most prominent vocalic position of the complement NP that assumes the role of a domain head.

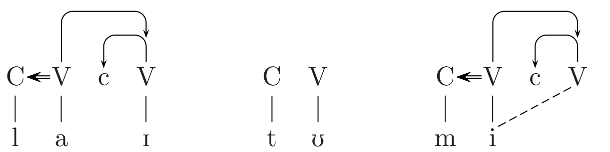
In the items given in (24) above, the infinitival particle and the preposition respectively, undergo incorporation into a preceding degenerate foot in quite the same way as it was done above by the indefinite article. This, as we have seen above, is a process of encliticisation. By way of illustration let us choose (24b), more precisely the string *lie to me*. Consider now the proper bracketing in (31) and the prosodic representations in (32) below.

(31) $[_{VP}[_{V}$ lie$]$ $[_{PP}[_{P}$ to$]$ $[_{N}$ me$]$ $]$ $]$

The representation in (32b) below attempts to capture the stage where *to* and *me* are already concatenated, but *lie* still lies out of the purview of prosodic relations.

(32) a. lexical representation

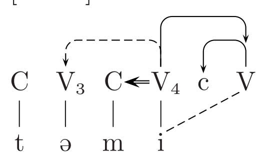
lie *to* *me*



b. intermediate representation

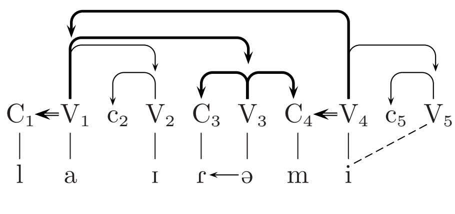
lie [*to me*]

— same as above —



c. final representation

[*lie to me*]



In (32a) we have the lexical representations of three respective items constituting the verb phrase *lie to me*. In *lie* the second (glide) portion of the diphthong is distinctively lodged in the second vocalic position, so that the latter is not at all empty. For this reason, left-to-right government may manifest itself only in terms of a metrical relation, since the second vocalic position is not empty. A similar relationship is manifest in the long vowel of *me*. Melody here spreads into the second position of the long vowel from the first one, and only after this process has taken place can left-to-right (metrical) governing relationship be established between the two skeletal positions of the long vowel. This is due to the fact that an empty vocalic position may not be properly governed from left-to-right over an empty consonantal position. The reason for this is quite simple: such a structural configuration would result in an empty cv[14] sequence, which is a mere lapse. Since an empty consonantal position followed by a governed empty vocalic position could only be interpreted as mere silence, the pronunciation of such a structure would amount to a short vowel followed by silence.

In (32b) we encounter again the now familiar default governing relation between V_4 and V_3 indicated by the dashed line. This dispreferred structure, however, is not invoked in (32c), where a more favourable binary trochaic foot is established, whereby V_1 has incorporated V_3 into a well-formed trochaic foot. Having received licence to govern, V_3 is now able to govern the consonants on both sides, causing them to lose their inherent muteness. In the case of the contentful consonantal position to the right of V_2, government contributes to flapping, already initiated by V_3 at the melodic level. In the case of C4 the effect of government is not detectable since the structure of sonorants is such that they may not undergo vocalic consonant lenition. On why sonorants may not be affected by vocalic consonant lenition cf. Csides (2000).

4 Summary

As opposed to currently held views in the theory of Government Phonology, we have claimed in this paper that government is neither left-to-right, nor right-to left but is bidirectional. Furthermore, the theory advocated here is based on the assumption that there is no difference between the principles governing stress and vowel reduction on the one hand, and the machinery regulating the manifestation of empty vocalic positions on the other. In other words, there is no separate metrical phonology and government phonology since the two areas are subject to the same set of organising principles. It has also been tacitly assumed that government is a structural relation primarily contracted by vocalic positions. Only if no further vocalic position is available can government strike down on a consonantal position in a VCV or VcV context, i.e., a consonantal position may only be affected by government as a last resort. Another proposal of the paper was to extend governing relations beyond the word domain by making a distinction between lexical and postlexical government. Moreover, we have seen that there are several exits from the lexicon depending on the length of the string subjected to phonetic interpretation. Governing relations contracted postlexically are also

[14] It may appear as a paradox that the second portion of the long vowel is represented by a capital V in the diagrams and yet the final two skeletal positions are referred to as an empty cv sequence. Notice, however, that the second portion of the long vowel is empty until spreading has taken place, and the diagrams illustrate a stage when this process has already taken place. In other words, the diagrams show the result of phonetic interpretation.

determined by the syntactic structure of the given string. In the framework proposed in this paper, governing relations are not subject to the principle of strict directionality, and locality is also considerably reassessed. The latter is defined by syntactic/morphological structure. Moreover, we have seen that phonology strives to maintain uniform foot structure wherever possible.

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