English Reduced Auxiliaries Really are Simple Clitics[*]

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In Memory of Tanya Reinhart

I wish that I could directly evoke the late Tanya Reinhart's work in this paper, but it has been some years since our research actually overlapped. The analysis developed below, however, is essentially a matter of characterizing an interface and some of the phenomena associated with that interface, and I think that was the kind of investigation that was of great interest to her.

I wish to claim that a rather traditional account is actually correct, despite the efforts that have been made over the years to replace it with something more complicated. A great deal has been written about the properties of reduced Auxiliary verbs in English, and especially about their presumed interaction with syntactic structure and processes, but I want to argue that our first impressions are accurate: the only property of these elements that is distinctive is the fact that they are phonologically reduced forms. Everything else about their distribution follows from independently motivated principles. If this is true, they fall into the class to which Zwicky (1977) suggested thirty years ago they belong: they are "Simple Clitics."

1   The English Reduced Auxiliaries

As background, let us first address some foundational issues in the ontology of clitics. Linguists tend to throw the word "clitic" around in a fairly free and unconstrained manner, assuming all the while that this refers to a single unified category whose properties are well established (and conveniently suited to whatever phenomenon is under discussion). There are really two quite distinct dimensions, however, that correspond to the qualification of a linguistic element as a clitic, and these need to be distinguished. Doing so was a major goal of Anderson 2005.

First, there is the sense in which pre-generative linguists used the word. A clitic in this sense is characterized by its phonology: it "leans on" or attaches phonologically to an adjacent word. Anderson 2005 proposes that this sense of "clitic" corresponds to the phonological consequences that follow when an item is lexically provided with a phonological representation that is prosodically deficient, in that it lacks some of the prosodic structure of full words. Since everything has to be fully incorporated into prosodic structure in order to be pronounced, the phonology of a language has to do something to integrate such elements, and the principles governing this are commonly referred to as rules (or constraints) of "Stray Adjunction." An element with this kind of phonology is a **Phonological** (or "Simple") Clitic, drawing on terminology originally introduced in a similar sense by Zwicky.

In contrast, the kinds of clitic that interest syntacticians are elements whose idiosyncrasy is not limited to phonology, but which have some sort of special principles of positioning that go beyond the syntax of comparable non-clitics. The parade examples here are object pronouns in Romance languages, and I will call those **Morphosyntactic** (or "Special") clitics: linguistic elements whose position with respect to the other elements of the phrase or clause follows a distinct set of principles, separate from those of the independently motivated syntax of free elements in the language. Most Special clitics are also Simple clitics, but the two dimensions can be shown to be quite independent.

Against that background, we can consider the properties of reduced auxiliaries in English. Although these are clearly phonologically weak forms, they also appear to interact with the syntax in distinctive ways that make it less than obvious that they are just Simple clitics. The forms we are talking about, of course, are the reduced variants of *is*, *has*, and a few others, as illustrated in (1).

(1) a. Fred's tall (Fred is tall)

b. Fred's already eaten (Fred has already eaten)

c. Fred'll do it (Fred will do it)

Note that a sentence with 's can correspond to one whose unreduced auxiliary is either *is* or *has*; and that while these are the most commonly cited forms, other auxiliaries also have reduced forms, as summarized in (2).

(2)

Full form	Reduced
is	's
are	're
am	'm
has	's
have	've
had	'd
will	'll
would	'd

An overall generalization is that the environments in which the reduced auxiliaries can occur are all ones where a corresponding full verb is possible as well. The relation is that of a *proper* subset, however, since there are sentences in which only the full verb is possible; it is the problem of characterizing the difference that has led to so much discussion. Before we address the conditions that limit the use of the reduced forms, though, we consider the properties they display that are clear and uncontroversial.

It might be suggested that the reduced forms are really just "reduced" in the sense that they are the product of independently necessary purely phonological principles governing rapid speech. Kaisse (1985), however, showed that the purely phonological account will not work, at least in the synchronic grammar of modern English. She demonstrated that the reduced forms of the auxiliaries are lexically idiosyncratic, and not derivable by general phonological (or "fast speech") rules. Some reduction of form is no doubt phonological, and this applies to any word that appears in unstressed position. But while all of *would, could* and *should* have parallel forms of this type ([wəd, kəd, šəd]), only *would* and not *could* or *should* has the idiosyncratic reduced form *'d*. Indeed, the two otherwise homophonous verbs *has* (one an auxiliary, and the other a main verb of possession) differ in that only the auxiliary has the reduced form 's (itself homophonous with the reduced form of *is*), although both can appear without stress. Consider the contrast in (3), for example.

(3) Fred's adopted a new cat, and his sister Joanna hăs a cat, too *vs.* his sister Joanna's a cat, too.

The verb *is* also has uses both as a main (copular) verb and as an auxiliary, but unlike *has,* both of these have reduced forms, as shown in (4)

(4) Fred's new cat is a Maine Coon; this cat here's that kind too, but Joanna's thinking of getting an Abyssinian.

It seems reasonable, therefore, to conclude (with Kaisse) that the reduced auxiliaries are lexically listed alternatives to the full forms, rather than being derived in the phonology. Of course, both the full and the reduced forms are subject to the phonology, and display variants (such as the fast speech forms just discussed) as a result. In particular, the reduced forms with the shapes 's (/z/) and *'d* (/d/) vary on the basis of the final segment of the preceding word. This variation, illustrated for the /z/ forms in (5), is identical with that shown by the inflectional affixes for plural and third person singular present, and by the possessive clitic.[1]

(5) a. Pat's ([s]) left, but Kim's ([z]) here, and Chris's ([əz]) coming later.

b. packs ([s]), pals ([z]), passes ([əz])

c. infects ([s]), cleans ([z]), induces ([əz])

d. Pat's ([s]), Kim's ([z]), or Chris's ([əz]) corkscrew

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[1]See Anderson 2008 for justification of the claim that the English possessive is a Morphosyntactic (or Special) clitic in the sense introduced above and in Anderson 2005.

Exactly parallel facts obtain for the relation between reduced auxiliary *'d* (representing *had* or *would*) and the regular past ending /-d/. It seems reasonable to conclude, then, that in structural terms the reduced auxiliaries are entirely analogous to these other grammatical elements, which are generally considered to be located in phonological structure as "syllable affixes" attached to the word to their left.

What this means in formal terms is that elements like the regular plural are adjoined to the final syllable of the preceding word, as illustrated in (6). This is motivated in part by the fact that the affixal consonants do not seem to participate in the otherwise tight constraints on the internal structure of English syllables. For some further discussion, see Anderson 2005.

(6) *thirsts*:

On this account, the location of the reduced auxiliary in phonological structure is the same, as illustrated in (7).

(7) *Tim's leaving*:

To summarize, the English reduced Auxiliaries are lexical variants of full forms, consisting of a single consonant. As such, they are "prosodically deficient," since a single consonant (especially an obstruent) cannot constitute a syllable in English. This means *a fortiori* that the reduced auxiliary also cannot be a foot, or a prosodic word ("PWord") on its own, because a prosodic word must contain at least one foot, which in turn has to contain at least one syllable. Those restrictions follow more or less from the definition of the hierarchy of prosodic categories, although there are a number of other features of prosodic structure that are subject to more language-particular variation.

The phonology of English, apparently, incorporates such stray segments into phonological prosodic structure as affixes in a way that disregards their syntactic affiliation: they go with the word on their left, even if they are syntactically more closely related to the material on their right. These are more or less irreducible facts about the reduced auxiliaries, and follow from their basic nature and phonological identity. What would be ideal would be if we could account for all other properties that the reduced auxiliaries display as following from these independently necessary phonological properties alone, thus treating them as "simple" clitics. And that, of course, is what I propose to do below.

2   The Syntax of the Reduced Auxiliaries

The reduced auxiliaries of modern English appear to be simply lexicalized reflexes of what were originally phonologically reduced variants of the corresponding full forms. Nonetheless, most of the literature on these elements since at least the early 1970s has been devoted to apparent syntactic conditions on their use. A variety of theories have presented them as either the product of a reduction process within the syntax or else as having syntactic conditions on their insertion. If any of these analyses were completely accurate, the reduced auxiliaries could not be mere simple clitics.

2.1 Reduction as Cliticization in the Syntax

Syntactic conditions on the appearance of reduced auxiliaries were proposed at least as early as King 1970, Zwicky 1970, and Baker 1971. In the work of this period, it was widely assumed that a syntactic operation was involved in the attachment of reduced auxiliaries to their hosts. In one (slightly later) formalization of this analysis, Kaisse (1985) argued that the reduced auxiliaries arise as the result of a syntactic operation that adjoins ("cliticizes") auxiliary elements to a preceding subject nominal. On this account, the syntax works with (an abstract representation of) the full auxiliary verb. Cliticization applies within the syntax, optionally displacing the auxiliary verb from its basic position and adjoining it to what precedes. Since this is a syntactic operation, any syntactic conditions on the appearance of reduced auxiliaries can be stated as conditions on the cliticization rule. The effects of this rule interact with the assignment of stress: when sentence stress applies to its output, the auxiliary is no longer in a position to take stress, and so does not. At this point, either the full or the reduced auxiliary could be chosen from the lexicon if cliticization has occurred, although the reduced form is *only* possible in the structurally adjoined position. The result of these operations then undergoes the regular phonology, as expected. A derivation of the sentence *Jack's leaving* on this analysis is given in (8).

(8) | $[\text{Jack}]_{\text{NP}}$ | $[\text{is}]_{\text{aux}}$ | $[\text{leaving}]_{\text{VP}}$ | (output of syntax) |
|---|---|---|---|
| $[[\text{Jack}] \text{ is}]_{\text{NP}}$ | $[t]$ | $[\text{leaving}]_{\text{VP}}$ | (cliticization) |
| $[[_{\,}\text{Jack}] \text{ is}]_{\text{NP}}$ | $[t]$ | $['\text{leaving}]_{\text{VP}}$ | (sentence prosody) |
| $[[_{\,}\text{Jack}]\text{z}]_{\text{NP}}$ | $[t]$ | $['\text{leaving}]_{\text{VP}}$ | (allomorph selection) |
| *Jack's* | | *leaving* | (voice assimilation) |

This account has some straightforward problems. Crucially, it assumes that the reduced auxiliary forms a structural unit together with what precedes it *in the syntax.* There is, however, no reason to believe that that is correct. Consider a sentence containing a reduced auxiliary attached to a preceding subject, such as the reduced variant of (9a). If the subject is displaced, the auxiliary attaches to whatever comes to precede it in derived structure, as in (9b). In particular, the reduced auxiliary cannot be displaced together with the subject, as in the bad (9c).

(9) a. I think <u>John's</u>/is at the door.
  b. Who$_i$ do you think $[e_i]$'s/is at the door?
  c. *<u>Who's</u> do you think at the door?

This behavior can be contrasted with that of another element that shows superficial similarities to the reduced auxiliaries, "contracted" negation, as illustrated in (10).

(10) a. Jones won't/will not be at the office tomorrow.
  b. Won't Jones be in the office tomorrow?
  c. *Will not Jones be in the office tomorrow?

Negation here combines with a preceding auxiliary verb to form a phonological unit: *will+not* can be replaced by *won't.* In that case, negation can (and indeed, must) move together with the auxiliary if the latter is displaced, although the two cannot be displaced together where their combination has not been replaced by a "contracted" form.

The similarity between these two cases is indeed superficial, however. As Zwicky & Pullum (1983) showed some years ago, the contracted negative in such sentences is not a clitic at all. Rather, the auxiliary verbs (alone in English, apart from main verb *be* and *have*) have inflected negative forms, so *won't* here is simply a negative verb, a single unit from the point of view of the syntax, while *will not* is a sequence of auxiliary verb plus negative particle. Kaisse's analysis of auxiliary reduction as syntactic adjunction suggests that a sequence of subject plus reduced auxiliary ought to function as a syntactic unit, just as a negative auxiliary verb like *won't* does, and this is not the case.

Of course, in the case of the reduced auxiliaries we could always avoid this conclusion by ensuring that the operation of cliticization only takes place after all displacements have occurred. The point, however, is that no such limitation is necessary if auxiliary reduction is not a matter of syntactic adjunction at all. Here is a place where the posited syntactic structural unity of the reduced auxiliary with what precedes it could in principle have observable consequences, but we need to take steps to ensure that those consequences do not actually ensue. In fact, there is no evidence at all for a structural unit composed of the reduced auxiliary and preceding material, except in the phonology, and so it makes sense to locate any structural adjustment there rather than in the syntax.

2.2 Does Syntax Constrain Reduced Auxiliaries?

Given the conclusion of the preceding section that "cliticization," to the extent such an operation is relevant to the English reduced auxiliaries, is phonological and not syntactic, we might well ask why a substantial literature should be premised on the notion that the syntax has a role to play in describing the distribution of these elements. In fact, it has long been noted that when we look at a full range of cases, we find that the reduced auxiliaries are systematically excluded from certain syntactic positions in which the unreduced form is perfectly acceptable, as in (11).

(11) Tim's happier than Kim is/*'s.

Corresponding to many sentence types in which the reduced auxiliary is perfectly acceptable, it is nonetheless excluded when the immediately following element has been displaced or deleted, as illustrated in the examples of (12).

(12)   a. Freddie's a werewolf this year for Halloween.

       b. Do you know what Freddie is/*'s (this year for Halloween)?

       c. Tommy has been a werewolf more often than Freddie has/*'s (on Halloween).

These basic facts were noted at least in the literature of the early 1970s (see the references at the beginning of section 2.1). They apply to a wide range of constructions involving displacement and deletion, including those in (13).

(13)   a. John is taller than Harry is/*'s [*e*].

       b. John has known Mary longer than Fred has/*'s [*e*] Martha.

As might be expected, the excluded reduced forms are all of those in (2), not just *'s*, as illustrated in (14).

(14)   a. Who do you think you are/*'r [*e*]?

       b. Fred's an Independent: he'd no more campaign for a Democrat than he would/*'d [*e*] for a Republican.

Since the condition on reduced auxiliaries that emerges from these examples seems to implicate displacement and deletion, canonical syntactic operations, it would appear that the syntax is indeed involved in determining when and where they can appear. That observation, in turn, has given rise to a variety of proposals as to how to incorporate the apparent syntactic conditions into their analysis.

2.3 Bresnan's (1978) Account

The syntactically based formulation of the generalization about reduced auxiliaries, associated originally with Baker's (1971) analysis, is that these are are blocked in the position immediately preceding an empty category. Later versions of syntactic theory would characterize this as the Trace of displacement or a deletion site.

An account of this condition that came to have quite remarkably wide acceptance among syntacticians was that of Bresnan (1978). She proposed that the reduced auxiliaries underwent an operation of cliticization, causing them to attach (as clitics) to their *right*. On that basis, it would be possible to suggest that when the position to the auxiliary's right is phonologically empty, the result is ill-formed, since a phonologically null element could not provide a prosodic host for the clitic and the purpose of the cliticization operation (presumably) is to provide such prosodic support for a phonologically weak element.

Although this analysis is undeniably ingenious and elegant, I have personally never understood why so many otherwise sensible syntacticians have found it persuasive, or even plausible. This is because as far as attachment is concerned, the phonology provides quite unambiguous and incontrovertible evidence that the reduced auxiliary attaches not to its right, but to its *left*, as illustrated by facts such as those of (5). In fact, the right context is completely irrelevant to the reduced form apart from the special limitations that gaps appear to impose — and of course that is the fact to be explained, so it cannot be invoked as the explanation.

If the reduced auxiliaries attached to their right, we would expect the combination of one of these elements with its right context would behave in some way as a unit. That this is not the case either for deletion or displacement is illustrated in (15).

(15)   a. John's been taking his medication every day, but Harry (*/'s been) stashing his under the mattress.

      b. *'S been Kobe talking trash again?

Of course, as with the similar facts adduced as evidence against Kaisse's analysis above in section 2.1, it would be possible to construct an account that evaded this conclusion (again, for instance, by ordering cliticization after all instances of constituent deletion or displacement), but the point is that the sort of evidence that might support attachment of the reduced auxiliaries to their right is systematically missing.

2.4   A Stress Conflict?

An alternative to Bresnan's (1978) analysis that covers at least some of the core cases is based on the observation that in sentences like (11) and (16), where the auxiliary is final within a clause (or major phrase), it would be expected to receive stress by the Nuclear Stress Rule of English. If that stress were to fall on an element consisting only of a single consonant (like 's), the stress could not be realized, and the ungrammaticality of the sentence might be attributed to that.

(16) John is happier with their marriage than his wife ìs/*'s [*e*].

Similar accounts might be offered for the unacceptability of reduced auxiliaries in Gapping and Pseudo-Cleft constructions such as (17). In the corresponding sentence with unreduced auxiliaries, we see that increased stress is associated with the position immediately preceding the gap, which could again be appealed to as inconsistent with the phonological character of the reduced auxiliaries.

(17)   a. Vicky has published more books than Tony hàs/*'s [*e*] articles.

      b. What Harry ìs/*'s [*e*] is a master of the story-teller's art.

It seems, however, that stress cannot be the entire story. In particular, the acceptability of a reduced auxiliary is not improved by other aspects of the sentence which might have the effect of reducing or displacing a potential main stress that might fall on it. This is true when a preceding element has special emphasis (thus attracting the stress), and also for the generally unaccented character of the auxiliary in certain inversion structures. These points are illustrated in (18).

(18)   a. Do you know what THAT ĭs/*'s [*e*] in the tree ahead of us?

      b. Pat's happier than ĭs/*'s [*e*] his brother-in-law.

It seems, therefore, that a more comprehensive solution must be sought than that offered by the incompatibility of main stress with phonologically minimal forms.
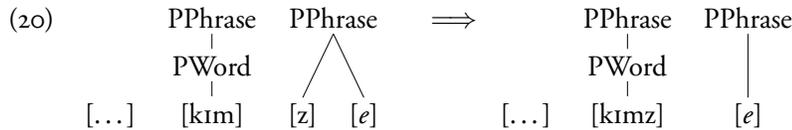
3   A Prosodic Solution

While stress does not appear to provide a complete solution to the problem of the distribution of the reduced auxiliaries, I suggest that more general considerations of prosodic structure do lead to a satisfactory analysis. Let us first recall the core contrast that serves as the basic observation: the fact that unreduced auxiliaries are disallowed when immediately followed by a deletion site within their phrase, as in sentences like (11) and (16). The difference between acceptable and unacceptable variants of these sentences can be expressed as that between a VP consisting of the auxiliary plus another word (where either reduced or unreduced auxiliary is possible) *vs.* one consisting of the auxiliary and no other phonetic material, where only the full form can appear, illustrated in (19).

(19) [$_{\text{VP}}$*is* [*e*]], [$_{\text{VP}}$*is happier*], [$_{\text{VP}}$*'s happier*] *vs.* *[$_{\text{VP}}$*'s* [*e*]]

To explore the problem with the reduced variant of sentence (11), consider what we know about its phonological structure. As supported by the facts in (5), a phonological adjustment of some kind is necessary to attach the reduced auxiliary to the word on its left. This is presumably a matter of simple cliticization as discussed in Anderson 2005, and results from the fact that a single consonant cannot form a syllable (or, *a fortiori,* a foot or a word) on its own in English, and this prosodic deficiency must be remedied by Stray Adjunction — which the facts of (5) show to operate leftward in this case.

3.1 Prosodic Structure and Syntactic Structure

For concreteness' sake, let us assume that (*ceteris paribus*) a phonological phrase ("PPhrase") is built to correspond to each syntactic maximal projection, including the VPs in the sentences of interest to us here. When the reduced auxiliary is adjoined to the word on its left, however, it ceases to be a part of its original PPhrase, since it becomes a part of a syllable that is in turn part of a PWord that is part of a different PPhrase.

(20)

$$
\begin{array}{c}
\text{PPhrase} \quad \text{PPhrase} \qquad \Longrightarrow \qquad \text{PPhrase} \quad \text{PPhrase} \\
\text{PWord} \qquad \qquad \qquad \qquad \qquad \text{PWord} \\
[\dots] \quad [\text{kɪm}] \quad [\text{z}] \quad [e] \qquad [\dots] \quad [\text{kɪmz}] \qquad [e]
\end{array}
$$

The result of the phonological adjustment in (20), then, is that the PPhrase originally built over the phonetic material corresponding to the VP is now left with no phonetic content at all. I propose that this is in fact what renders a reduced auxiliary in this position unacceptable: it leads to a violation of a fundamental principle of prosodic structure to the effect that a PPhrase has to be supported by at least one PWord, which in turn has to be supported by some phonetic content. Although presumably derivable as a theorem from other principles of prosodic structure, this is stated as an independent constraint in (21).

(21) *$[_\mathbf{PPhrase}\emptyset]$: Phonetically empty PPhrases are disallowed.

If this is the correct way to look at the problem, what is bad about the reduced variant of (11) is that it leads to a configuration in which a motivated PPhrase would come to have no content apart from the reduced auxiliary, which in turn has to move out of that phrase to adjoin to the preceding word.

To flesh out this analysis, we need to examine the principles responsible for the construction of prosodic structure. It is quite clear that this is closely related to syntactic structure, while remaining logically independent of it. The basic issue is well laid out by Tanya Reinhart in her final book:

> "A system perfect for communication would be one in which precisely the same syntactic tree that is needed to enable the semantic interface would also be the one that is spelled out phonetically [...] (For example, phonological boundaries correspond exactly to phrase boundaries, and intonational contours reflect hierarchy relations of the tree). PF, in this case, is nothing but the physical coding of an abstract syntactic tree. [...] However, there seems to be ample evidence from phonology that human language is not that perfect. There are independent phonological requirements that can only be satisfied assuming a distinct derivational phonological tree [...] the phonological and syntactic derivations cannot be isomorphic.
>
> [T]he most common approach to the derivation of the phonological tree is that it is constructed by applying certain well-defined and restricted operations on the syntactic tree, but taking into account edges that are not imposed by the syntactic tree." —Reinhart 2006, pp. 137f.

We can approach the principles that govern the relation between syntax and prosody in terms of a system of constraints, along lines developed by Selkirk (1995) and Truckenbrodt (1999). Some of these constraints encode the basic nature of well-formed prosodic structures, along lines developed in other terms by Nespor & Vogel (1986) and other scholars, treating the relevant principles as potentially violable ranked constraints rather than as absolute conditions. Other constraints, however, serve to link prosodic form to syntactic structure. They do this by choosing among possible alternative prosodic organizations of the phonological material realizing terminal nodes of the syntactic representation.

Most basically, Lexical Words should project as Prosodic Words and *vice versa*, as required by (22).

(22)   a. **LWdCon**: Lexical word boundaries should be PWord boundaries.

       i. **Align(LexWord,L,PWord,L)**

       ii. **Align(LexWord,R,PWord,R)**

    b. **PWdCon**: PWord boundaries should be lexical word boundaries.

       i. **Align(PWord,L,LexWord,L)**

       ii. **Align(PWord,R,LexWord,R))**

In the prosodic structure that is associated with a given syntactic structure, phrase edges should correspond to word edges. In fact, as Selkirk (1995) observes, this may fail to be the case if some "prosodically deficient" function words are directly attached to PPhrases without being a part of any PWord. The constraint that is relevant for our purposes here, given in (23), imposes this requirement on the right edges of phrases.

(23) **Align-PP,R**: The right edge of a PPhrase should be aligned with the right edge of a PWord (A PPhrase should end with a PWord).
[**Align(PPhrase,R,PWord,R)**]

In global terms, the most important relation between prosodic and syntactic structures is probably the preference for something close to isomorphism in their phrasal organization: syntactic maximal projections should correspond to phonological phrases, and *vice versa.* The relation in most cases is more complicated than this, but let us take something like the constraint in (24) to express this generalization with respect to the right edges of phrases.

(24) **Align-XP,R**: The Right edge of each Lexical Maximal Projection should coincide with the Right edge of a PPhrase.
[**Align(Lex^Max,R,PPhrase,R)**]

A set of proposed rankings of these constraints (together with others not discussed here) for English is given in (25). For further discussion of these matters, see Anderson 2005, pp. 55-74.

(25) **Align-XP,R; Align(PPhrase,R,PWord,R) ≫ LWdCon; NonRecursive(PWord) ≫ PWdCon; ExhaustivePPh**

3.2   Putting Prosodic Structure to Use

If the default prosodic structure is constructed in accordance with the principles suggested in section 3.1, then when we combine those with the constraint (21) prohibiting phonetically empty PPhrases we can see that at least some of the core cases in which reduced auxiliaries are impossible can be accounted for.

Consider the sentence in (26) for example. Assuming that the time adverb here is an adjunct, the structures assigned will be as in (26b), where syntactic structure is indicated with square brackets and prosodic PPhrases are indicated with parentheses. After the locative complement (*where*) is displaced, the XP headed by the verb will consist only of that element, as will the PPhrase built on it.

(26) [***wh*-movement**:]

  a. I wonder where the concert ìs/*'s [*e*] on Wednesday.

  b. (I wonder where$_i$) [[[(the concert)]$_{XP}$ [(is/*'s [e_i])]$_{XP}$] [(on Wednesday)]$_{XP}$]

  c. I wonder where the concert wàs on Wednesday.

If a reduced auxiliary form is chosen, this will necessarily be re-associated (as discussed above) with the syllable (and thus foot, and thus PWord) to its left, leaving this PPhrase empty in violation of (21). A verb with no reduced form, as in (26c), displays the stress typical of PPhrase-final position, confirming the presence of this constituent.

This is, however, only part of the story. As Reinhart observed, some prosodic edges must be constructed that do not correspond directly to syntactic constituent edges. In particular, other constructions with gaps block the appearance of reduced auxiliaries even though maximal projection (XP) boundaries do not give us all of the prosodic structure we need to invoke (21) in the way that was possible for (26). What is striking about these example, however, is that the prosodic structure is typically just what is needed for this purpose, even though that structure is not entirely derived from its relation to XP structures. In the case of Gapping examples like (27), for example, it is clear that a PPhrase property occurs immediately after the verb, as required, as a property of the Gapping construction. The structure is as in (27b).

(27) [**Gapping**:]

  a. Fred is tired of Spinoza, just as I am/*'m [*e*] of Kant.

  b. Fred is tired of Spinoza, (just as I) [(àm/*'m [[*e*]) (of Kant)]]

Similar facts obtain in the construction exemplified in (28), in which an Adjective is pre-posed out of the AdjP it projects. As illustrated in (28), the impossibility of the reduced auxiliary in this case can be related to the prosodic structure in (28b), confirmed by the (PPhrase-final) stress on the verb when this is unreduced.

(28) [**Adj-preposing**:]

    a. Tired as he is/'s [*e*] of his job at the carwash, Fred can't find anything better.

    b. Tired as he [(ìs/*'s [[*e*]) (of his job) (at the carwash)]]…

It could be that the extra prosodic constituents in these sentences are idiosyncratic properties of the individual constructions (Gapping, Adjective Preposing, etc.). More plausibly, however, they are due to something more general in the relation of syntactic to prosodic organization. Apparently, deletion sites (including the gaps left by displacement operations) induce an immediately following PPhrase boundary. This might be described by invoking the constraint in (29), appropriately ranked with respect to the other principles of prosodic structure construction.

(29) **Align([*e*],R,PPhrase,R)**: Syntactic gaps are followed by a PPhrase boundary.

If this were the entire story, all that would have been accomplished would be a mild re-formulation of the insight that reduced auxiliaries are excluded preceding a gap. The constraint in (29) is not, on the face of it, much less stipulative than the original observation. In fact, though, the restriction on reduced auxiliaries is not limited to positions preceding a gap, and the prosodic account (based on (21)) accommodates these cases as well.

For example, Pullum & Zwicky (1998) observed that reduced auxiliaries are also impossible in the constructions illustrated in (30), where the gap (if there is one) is not adjacent to the auxiliary element, and thus could not be responsible for the impossibility of the reduced form.

(30) **Comparative Subdeletion:** Marie's a better scientist (than Pierre) (ìs/*'s) (an [*e*] engineer).

    Subject-Aux Inversion: Marie's better known than (ìs/*'s) (her husband [*e*]).

In both of the constructions of (30), note that the natural phrasing of the sentence is such that a PPhrase ends after the auxiliary in question, and a new one is initiated. Whatever the basis for this effect, the phrasing we observe must be incorporated in the grammar, and once it is, the exclusion of the reduced auxiliary forms will follow in the same way as in the pre-gap cases.

Even more obviously, parentheticals as in (31) are phrased separately, and thus induce PPhrase boundaries that once again block the occurrence of reduced auxiliaries — again, without appeal to the presence of a gap.

(31)   a. John (ís/*'s), (my dear), (a bastard).

    b. John, (my dear,) (is/'s a bastard).

Another construction noted in Pullum & Zwicky 1998 and illustrated in (32), involving no gap at all, is characterized quite explicitly by the occurrence of special emphasis which induces additional prosodic constituents, which in turn lead to configurations from which the reduced auxiliaries are excluded by (21).

(32) **Rejoinder Emphasis**: Fred (ìs/*'s) (TOO) (going to fix it).

It seems, therefore, that it is really possible to reduce the limitations on the appearance of reduced forms of the auxiliaries to consequences of their phonological shape. An auxiliary that is prosodically deficient (as all of the reduced forms are) cannot appear in a prosodic structure where its independently motivated phonology will lead to a violation of the general principle in (21). Syntax is implicated indirectly in the construction of prosodic structure, but not directly in constraining the distribution of the reduced auxiliaries. The phonological form of these makes them simple clitics in the sense of Anderson 2005, and that is all that needs to be said.

4 "Wanna" Contraction

A very similar solution presents itself for another phenomenon in which syntactic conditions on phonological "reduction" have been proposed. As is well know, the sequences *want to, have to,* and *going to* can be replaced by *wanna, hafta* and *gonna* under some circumstances but not others. These contrasts are illustrated in (33).

(33) a. New Haven is the place I want to/wanna go next.

b. Fred is the guy I want [*e*] to/*wanna go next.

c. Community college is the only place he's going to/gonna get into.

d. New Haven is the next place he's going [*e*] to/*gonna find out whether he likes the east coast.

e. This is the money I have to/hafta give to my sister.

f. This is the money I have [*e*] to/*hafta get through the week.

In all of these cases we have virtual minimal pairs for the possibility *vs.* impossibility of the contracted forms. The generalization that has been widely adopted in the literature is again based on the appearance of gaps: Contraction fails exactly when the words to be contracted are separated by the trace of a displacement operation. This certainly seems to be accurate in observational terms, but it seems remarkably stipulative on its face. It seems quite unlikely that children learning English could learn this principle, at least easily, and yet there is no evidence that they ever make mistakes in this regard.

In fact, though, we already have the tools necessary to improve on the purely observational account. Consider the way the sentences in question, such as those in (34), are divided into PPhrases.

(34) a. This (is the money) (I have to/hafta give [e]) (to my sister).

b. This (is the money) (I have [e]) (to/*hafta get through the week).

As required by (29), syntactic gaps induce a following PPhrase boundary, if one is not already present, as illustrated by the prosodic structure (shown with parentheses) in these examples. But now let us ask what the analysis of "hafta" ought to be. In phonological terms, it is a unitary word, a "portmanteau" in Hockett's (1947) terms: *hafta* = [hæftə] = {HAVE}+{TO}, just as French *du* = [dü] = {DE+LE} or *au* = [o] = {à+LE}. And the phonology of "hafta" is that of a single PWord, composed of a foot made up of two syllables as shown in (35).

(35) [hæftə] = $((hæf)_\sigma (tə)_\sigma)_{PWord}$

As such, if "hafta" were to be inserted for HAVE+TO in a sentence like (34b), that single PWord would have to be part of two distinct PPhrases. But such a configuration is surely excluded, as expressed by the constraint in (36), by any rational notion of the structural nature of prosodic structure. Surely this, like syntactic form, has the properties of a directed acyclic graph, which excludes a single (PWord) node that is the daughter of two distinct (PPhrase) mothers.

(36) A single PWord can be part of only one PPhrase.

In the case of "wanna" Contraction, as in that of the reduced auxiliaries, the role of the syntax is simply to serve as the basis on which prosodic structure is developed. Once that structure has been built, the phonological properties of the elements involved, and their independently motivated consequences, predict the distributions without the need to invoke further syntactic conditions.

5 Conclusion

At the interface, syntax constrains the construction of prosody. Phonology operates on the basis of the result, and so apparently syntactic conditions on elements like the reduced auxiliaries and "wanna" are actually due to the interaction of their phonological properties with that structure. The only thing distinctive about them is their independently necessary phonological form: in particular, the reduced auxiliaries really are just simple clitics.

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