

**The Interaction of Linearization and Prosody:  
Evidence from Pronoun Postposing in Irish\***

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**1. Introduction**

Word order in Modern Irish is VSOX in finite clauses, where X is an adjunct or indirect object. However, weak pronoun objects can occupy a position further to the right in the sentence as compared to full DP or strong pronoun objects. This rightward displacement is referred to as pronoun postposing (Chung & McCloskey 1987; Duffield 1995; Adger 1997, 2007; Doyle 1998; McCloskey 1999, Mulkern 2003, this volume):<sup>1,2</sup>

(1) Full DP and strong ('emphatic') pronoun objects precede an adjunct or adverb:

- a. Léigh Liam **leabhar/eisean** ar an traein aréir.  
read Liam book/it-STR on the train last-night
- b. \* Léigh Liam ar an traein **leabhar/eisean** aréir.  
read Liam on the train book/it-STR last-night
- c. \* Léigh Liam ar an traein aréir **leabhar/eisean**.  
read Liam on the train last-night book/it-STR  
'Liam read a book/IT on the train last night.'

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<sup>1</sup> Pronoun postposing also occurs in Scottish Gaelic. However, I limit my discussion to Modern Irish. All data are from Modern Irish.

<sup>2</sup> Abbreviations used in example sentences: AUT 'autonomous', COP 'copula', FUT 'future tense', GEN 'genitive', NOM 'nominative', PST 'past', PRT 'particle', STR 'strong', VN 'verbal noun', WK 'weak'.

(2) Weak pronoun objects can follow an adjunct, either medially (2a) or finally (2b)<sup>3, 4</sup>

- a. ?Léigh Liam *é* ar an traein aréir.  
read Liam it-WK on the train last-night
- b. Léigh Liam ar an traein *é* aréir.  
read Liam on the train it-WK last-night
- c. Léigh Liam ar an traein aréir *é*.  
read Liam on the train last-night it-WK  
'Liam read it on the train last night.'

There does not appear to be any difference in semantic interpretation between (1) and the various positions of the pronoun in (2), and the placement of the weak pronoun seems to be unrelated to discourse factors (McCloskey 1999, but see Mulkern 2003, this volume). However, weak pronouns differ from full DPs (which contain lexical words) and strong pronouns by being prosodically weak, suggesting that pronoun postposing may be prosodically-motivated (see also Adger 1997, 2007; Doyle 1998; McCloskey 1999).

Following this line of reasoning, I argue that the positioning of weak object pronouns is not syntactic, but that pronouns are postposed in order to satisfy a prosodic well-formedness constraint against weak elements in the initial position of phonological phrases ( $\varphi$ ). I analyze the patterns using violable constraint interaction under an Optimality Theoretic framework (OT, Prince & Smolensky 1993/2004) with phase-based Multiple Spell-Out (Chomsky 2000). Under this model, a ranked constraint hierarchy evaluates potential candidates for surface linearized form at the Spell-Out of each phase. Normal word order can be altered to fulfill prosodic requirements when prosodic constraints outrank constraints on linearization. I propose that

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<sup>3</sup> The status of (2)a, where the weak pronoun is not postposed, is unclear. For many speakers, this is perfectly acceptable, but can be vaguely dispreferred to (2)b or (2)c. Some older speakers seem to have a stronger dispreference for this positioning. I will assume that this option is available to most speakers, but mark these sentences with a question mark.

<sup>4</sup> Unlike Scottish Gaelic, all weak pronouns, including first and second person, postpose in Irish.

pronoun postposing in Irish results from just such a conflict between prosody and linearization (see also López 2009 for a similar analysis of clitic dislocation in Romance languages).

I argue that normal linearization of the weak pronoun object, based on syntactic linearization as by a linearization algorithm such as the Linear Correspondence Axiom (LCA, Kayne 1994), would result in a prosodically-suboptimal surface form. This follows from the assumption that under the Multiple Spell-Out hypothesis, syntactic structure is spelled-out in chunks corresponding to phases. I assume that  $vP$  is a phase, that the complement of  $vP$  constitutes a Spell-Out domain (Chomsky 2000), and that this Spell-Out domain corresponds to a prosodic domain  $\varphi$  (Adger 2006, Ishihara 2007). Because objects in Irish are syntactically initial in the complement of  $vP$ , unpostposed weak pronouns would be initial in  $\varphi$ , a position that prefers prosodically strong rather than weak elements.

Like other prosodic constituents,  $\varphi$ s have a dispreference for weak independent elements that are initial within their domains (Selkirk to appear). Syntactic function words differ from lexical words and emphatic pronouns by not being spelled-out as prosodic words ( $\omega$ , Selkirk 1995) such that they are prosodically weak. The absence of weak pronouns in  $\varphi$ -initial position in Irish can be interpreted as a prosodic requirement that the initial element in  $\varphi$  be relatively strong: pronoun postposing satisfies the prosodic constraint against initial weak elements by removing the weak element from  $\varphi$ -initial position.

This paper is organized as follows. Section 2 outlines the assumptions on basic clause structure in Irish, syntactic Spell-Out, syntax-prosody correspondence, and Multiple Spell-Out. Section 3 motivates the prosodic markedness constraint responsible for pronoun postposing. Section 4 discusses linearization and develops an analysis of pronoun postposing as the interaction between prosodic markedness and a violable constraint on linearization. Section 5 discusses a



This structure relies on the following assumptions:

- (a) Following the arguments in McCloskey (2001, 2009), the subject raises to Spec,TP, and the verb raises to a functional projection  $\Sigma P$  which is higher than the subject but below CP.
- (b) I assume the Split VP hypothesis (Koizumi 1995). Objects move from Comp,VP to a higher position below  $v$  (Spec, $\mu P$ , following Johnson 1991; see also Carnie 1995 for a similar proposal using AgrO).
- (c) Adjuncts are VP adjuncts, and are thus below  $vP$ .

Pronouns occupy the same syntactic position as other objects in Irish: Spec, $\mu P$ . This is their position prior to Spell-Out.

## **2.2. Phases and Multiple Spell-Out**

Spell-Out involves the translation of syntactic structure into phonological structure. I interpret this such that the input to the phonological evaluation is the hierarchical structure produced by the syntactic component of the grammar. Spell-Out involves a number of operations; in this paper, I will only be concerned with the following:

- (a) *Prosodic structure assignment*: the creation of prosodic constituents and domains.
- (b) *Linearization*: the translation of syntactic hierarchical relationships into linear precedence relationships.

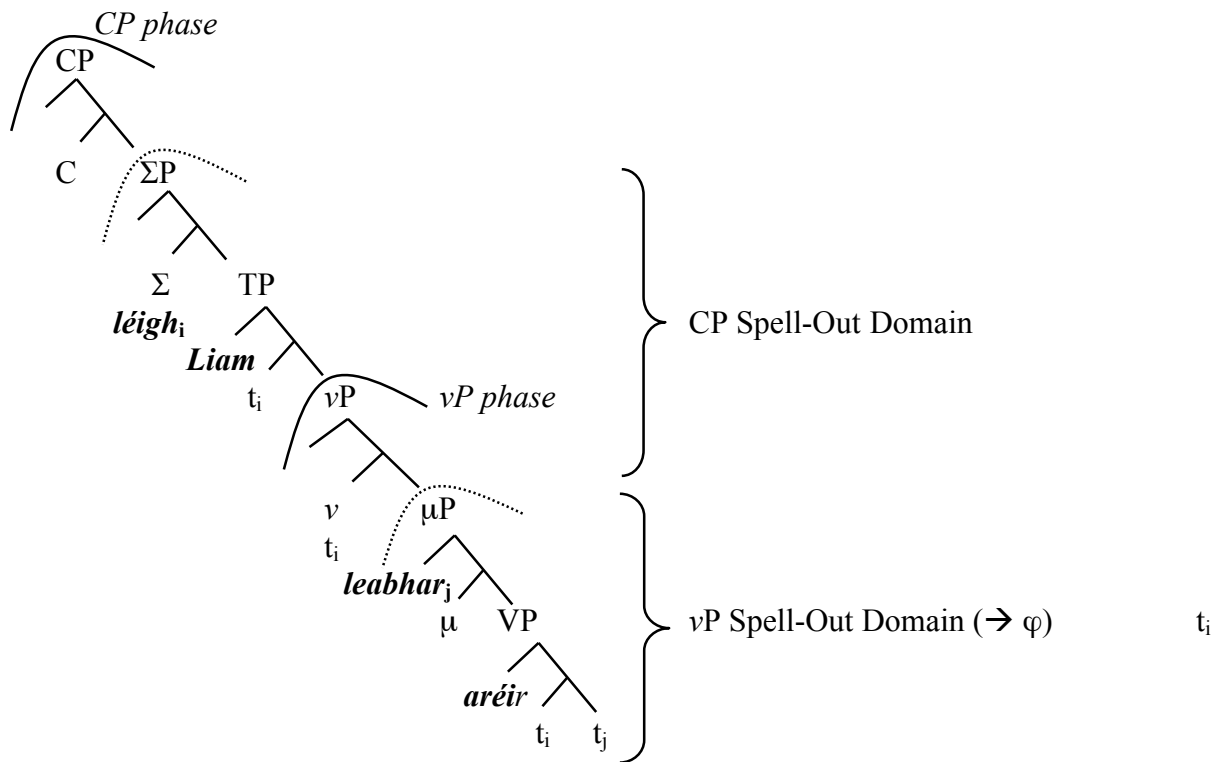
Spell-Out may be interpreted as an OT evaluation where the above operations are evaluated in parallel. If prosodic structure and linear order are evaluated concurrently, they will interact directly and may affect one another.

Phase Theory (Chomsky 2000) claims that syntactic structure is spelled-out piece-wise rather than all at once. I assume that phases correspond to the functional projections  $vP$  and CP, and

that Spell-Out targets their complements, which correspond to Spell-Out domains (following Chomsky 2000). Following proposals by Adger (2006) and Ishihara (2007), among others, I assume that the phase domain consisting of the complement of  $vP$  (beginning with  $\mu P$  in the above structure) corresponds to a prosodic domain  $\varphi$ .<sup>5</sup> The following tree illustrates how the structure of a sentence such as that in (3) may be spelled-out under this approach to Multiple Spell-Out:

- (4) a. Léigh Liam leabhar aréir  
 read Liam book last-night  
 ‘Liam read a book last night.’

b. Phases and Spell-Out Domains

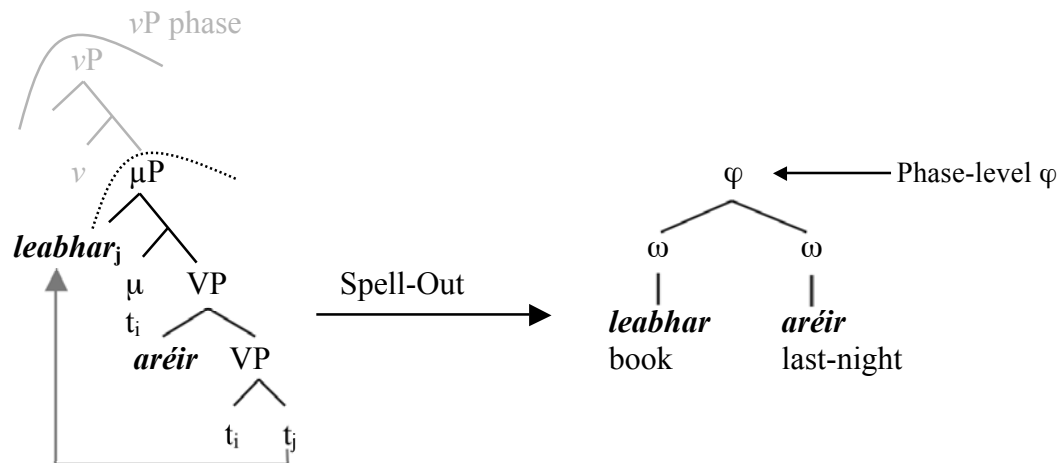


<sup>5</sup> Here, and elsewhere in this paper, I use the following symbols to abbreviate prosodic categories:  $\omega$  refers to a prosodic word,  $\varphi$  to a phonological phrase, and  $\iota$  to an intonational phrase.

For example, the Spell-Out of the  $vP$  phase for (4) (repeated below) results in the following prosodic structure, where the material spelled-out in the Spell-Out domain of  $vP$  is parsed as a  $\varphi$ :

- (5) a. Léigh Liam  $vP$ [  $\mu P$ [leabhar aréir]]  
 read Liam book last-night  
 ‘Liam read a book last night.’

b. Prosodic Spell-Out of  $vP$  phase:



Under an OT framework, this correspondence relation between phase and  $\varphi$  may be governed by violable constraints, which can interact with other constraints at Spell-Out (see also Selkirk 1995, 2009, to appear for discussion of constraint violability and syntax-prosody correspondence constraints). If this is the case, the phasal constituent will be reflected in prosodic phrasing when possible, but this correspondence relation may be subverted to satisfy higher-ranked constraints.

### 3. Motivating pronoun postposing

I assume that objects in Irish move to Spec, $\mu P$ , and that they are initial within the Spell-Out domain of  $vP$ . They are then also initial within the  $\varphi$  that corresponds to the Spell-Out domain of the  $vP$  phase, as shown in the above derivation. As in most other languages, pronouns in Irish differ from other objects because, as function words, they lack the status of  $\omega$  (Selkirk 1995). Cross-linguistically, prosodic phrases prefer their initial (left) edge to be prosodically strong.

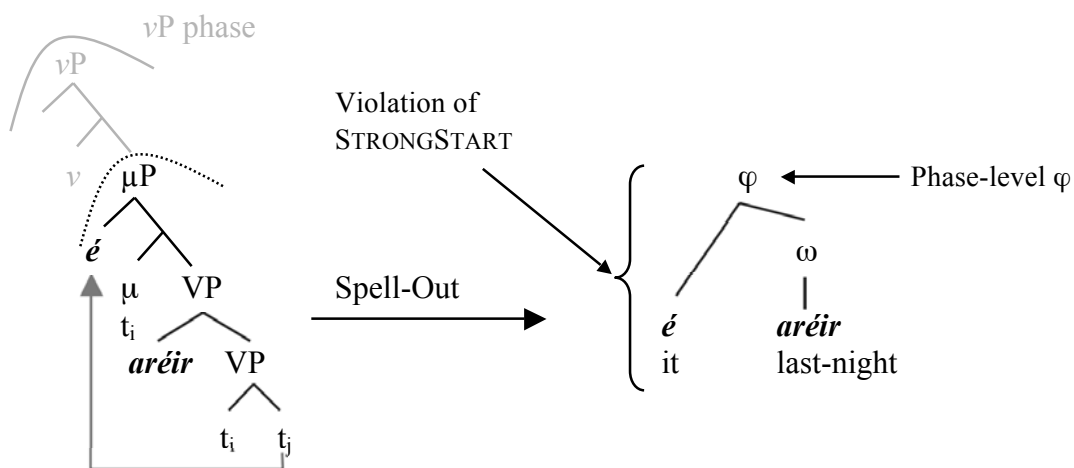
This preference can be captured using the (violable) prosodic markedness constraint **STRONGSTART**, which disfavors prosodic constituents that begin with a sequence of two prosodic elements where the first is lower in the prosodic hierarchy than the immediately following prosodic element:

- (6) **STRONGSTART**: assign one violation mark for every prosodic constituent whose leftmost daughter constituent is lower in the prosodic hierarchy than a sister constituent immediately to its right:  $*(\pi_n \pi_{n+1} \dots)$  (after Selkirk to appear)

For instance, **STRONGSTART** will be violated by a prosodic constituent  $\varphi$  that immediately dominates two prosodic elements where the first is weaker than the second, as in a sequence of a weak pronoun (which is less than a  $\omega$ ) followed by a full lexical word (parsed as a  $\omega$ ). **STRONGSTART** can also be seen to play a role in other languages: see Selkirk (to appear) for a review and discussion. This can be seen in the following depiction of Spell-Out, where a sequence of weak pronoun followed by a lexical word violates **STRONGSTART**:

- (7) a. Léigh<sub>vP</sub>[ Liam  <sub>$\mu$ P</sub>[ é aréir]]  
 read Liam it last-night  
 ‘Liam read a book last night.’

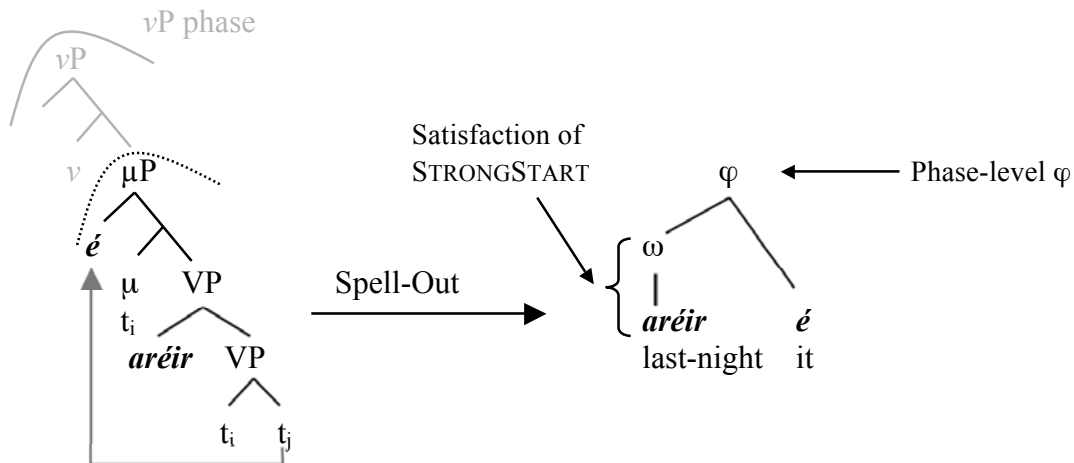
b. Structure violating **STRONGSTART**





Given this structure, there is now a clear advantage to postponing the pronoun in this environment. More specifically, pronoun postponing satisfies STRONGSTART:

(8) Postposing satisfies STRONGSTART



This analysis predicts that weak pronouns will postpose when they are at the left edge of a  $\varphi$  (see section 5.7 for a discussion of optionality). This analysis can be compared with prosodic analyses of second-position (pen-initial) clitics, where it is thought that the weak clitic element is dispreferred in initial position due to a prosodic constraint that disprefers the weak element sentence-initially (see Werle 2009 for a similar analysis of sentence-initial second-position clitics in Serbo-Croatian). Weak object pronouns in Modern Irish are weak elements that disprefer initial position in a sentence-internal prosodic domain (see Kahnemuyipour 2008, Kahnemuyipour & Megerdooomian 2010 for an analysis of a  $vP$ -initial second position clitic in Eastern Armenian). Pronoun postposing may therefore be seen as part of a larger pattern of clitic displacement found cross-linguistically.

Before moving on to the formal analysis, there are two issues that need to be mentioned. First, pronoun postposing never breaks up a syntactic phrase, even when this phrase contains more

than one  $\omega$ . For example, in the following sentence, the weak pronoun must postpose around the entire PP, and cannot be realized anywhere inside the PP:

- (9) a. ?Léigh Liam é ar an traein luath  
read Liam it on the train early  
'Liam read it on the early train.'  
b. Léigh Liam ar an traein luath é  
read Liam on the train early it  
'Liam read it on the early train.'  
c. \*Léigh Liam ar an traein é luath  
read Liam on the train it early  
'Liam read it on the early train.'

I will not be able to provide a formal analysis for this here, but I assume that there is a syntax-prosody correspondence constraint that prefers the material contained within a prosodic constituent to contain only the material contained within the corresponding constituent in the syntax (here, the PP). The pronoun is not part of the PP in the syntax, and therefore cannot break up the PP. This constraint will be low-ranked in languages where it is possible for a weak element to break up a syntactic phrase, as in Serbo-Croatian (e.g. Werle 2009).

Secondly, other weak elements, including determiners and prepositions, never postpose. For example, the determiner in the phrase *an leabhar* 'the book' always precedes its noun, even when it is a  $\nu$ P-phase-initial object. While I will not attempt to provide a full account, the difference between weak elements like determiners and prepositions on the one hand, and weak pronouns on the other, most likely relates to a difference in their syntactic configuration: the former are heads which may adjoin to N, while the latter are specifiers, and in a different syntactic relationship with the following adjunct or other element within the  $\nu$ P-phasal domain. One possibility is that there is a constraint that keeps together the material that is in a head-complement relation but is not violated by the separation of material in other syntactic configurations.

## 4. Linearization

### 4.1. Linearization versus Syntactic Movement

In the previous section, I argued that pronoun postposing is motivated by the satisfaction of the prosodic markedness constraint STRONGSTART, and that pronoun displacement is part of a larger pattern of clitic displacement from prosodic phrase-initial position. Under the prosodic analysis proposed above, the rightward displacement of the weak pronoun appears to be well-motivated. However, if the movement is instead syntactic, the rightward movement is highly unusual: one reason that pronoun postposing presents an intriguing problem is that it appears to involve rightward movement of a prosodically light unit. Other Indo-European languages tend to move light prosodic units leftwards, as in object shift in Scandinavian languages (Holmberg 1986) or particle verbs in English (*put it down* vs. *\*put down it*, Johnson 1991). In contrast, prosodically heavy units tend to move rightward in many languages (e.g. Heavy NP shift). Even more puzzling is that the preference for rightward movement of heavy elements also exists in Irish, concurrently with weak pronoun postposing (Stenson 1981:44, Doyle 1998, McCloskey 1999), as can be seen in the following example:

- (10)a. Déanfaidh mé amárach an teachtaireacht a d'iarr tú orm.  
do.FUT I tomorrow the errand that asked you on.me  
'I'll do tomorrow the errand that you asked of me.'
- b. Déanfaidh mé an teachtaireacht amárach.  
do.FUT I the errand tomorrow  
'I'll do the errand tomorrow.'

However, if pronoun postposing is not really movement in the syntactic sense, but is an effect of linearization at Spell-Out, we preserve the hypothesis that syntactic movement tends to be leftward, as well as the hypothesis that syntactic movement is never phonologically-motivated (as assumed in a typical Y-model of the grammar). Since prosodic structure assignment also occurs at Spell-Out, we expect that prosodic factors may be able to influence linearization if they

are assigned concurrently and compete with each other, as in an OT grammar. In most cases, linear order will surface as expected from syntactic structure. However, in the case of a direct conflict between a prosodic markedness constraint and linearization, linear order may be altered to satisfy the prosodic constraint if the prosodic constraint is ranked higher in the language's grammar than the constraint governing linearization. This can result in what appears to be rightward movement of a syntactic element, if the prosodic constraints prefer rightward rather than leftward displacement of the target word.

#### 4.2. The LCA

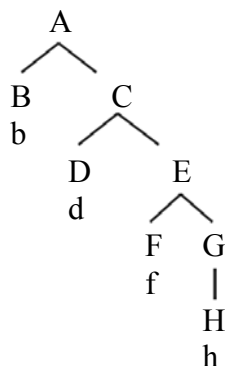
Linearization maps hierarchical syntactic structure onto linear order. While there are many proposals relating to how this process is achieved, I will assume for concreteness the proposal in Kayne (1994), the Linear Correspondence Axiom (LCA). The LCA determines linear order on the basis of asymmetric c-command relationships under the assumption that syntactic structure is exclusively left-branching:

##### (11) Asymmetric C-Command:

A syntactic node  $\alpha$  asymmetrically c-commands a syntactic node  $\beta$  iff  $\alpha$  c-commands  $\beta$  and  $\beta$  does not c-command  $\alpha$ .

In the following hypothetical tree, the set of asymmetric c-command relations ( $A$ ) are as follows:

##### (12) Abstract syntactic tree structure



(13) Set of asymmetric c-command relations (ordered pairs)

$$A = \{ \langle B, D \rangle, \langle B, F \rangle, \langle B, G \rangle, \langle B, H \rangle, \langle D, F \rangle, \langle D, G \rangle, \langle D, H \rangle, \langle F, H \rangle \}$$

The LCA establishes precedence relationships on the terminal nodes of syntactic phrases on the basis of these asymmetric c-command relationships:

(14) **Linear Correspondence Axiom** (LCA, Kayne 1994, paraphrased):

If a syntactic node  $\alpha$  asymmetrically c-commands a syntactic node  $\beta$ , then the set of terminal nodes dominated by  $\alpha$  linearly precede the set of terminal nodes dominated by  $\beta$ .

In the hypothetical example above, the set of asymmetric c-command relations ( $A$ ) can be translated into precedence relations for terminal nodes ( $d(A)$ ):

$$(15) A = \{ \langle B, D \rangle, \langle B, F \rangle, \langle B, G \rangle, \langle B, H \rangle, \langle D, F \rangle, \langle D, G \rangle, \langle D, H \rangle, \langle F, H \rangle \}$$

$$d(A) = \{ \langle b, d \rangle, \langle b, f \rangle, \langle b, h \rangle, \langle d, f \rangle, \langle d, h \rangle, \langle f, h \rangle \}$$

The only possible linear ordering that respects the precedence relationships  $d(A)$  is  $bdfh$ .<sup>6</sup>

### 4.3. Linearization as a violable constraint

Like the STRONGSTART constraint, linearization may be governed by a violable constraint (see also López 2009), which may be defined formally as follows:<sup>7</sup>

(16) LINEARCORRESPONDENCE (LINCORR): assign one violation mark for every syntactic node  $\alpha$ , whose terminal nodes do not precede the terminal nodes dominated by a syntactic node  $\beta$  which  $\alpha$  asymmetrically c-commands.

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<sup>6</sup> This interpretation of the LCA requires that the LCA cannot see inside words or intermediate projections.

<sup>7</sup> López (2009) also proposes that reinterpreting the LCA as a violable constraint can account for some cases of rightward movement; however, his analysis differs from the present analysis by assuming that linearization is evaluated between each pair of terminal nodes and that prosodic structure is built gradually as each pair of nodes is linearized. I assume that Spell-Out is phase-based such that the linearization of all nodes within the Spell-Out domain occurs simultaneously, and that prosodic structure is evaluated in parallel. This approach may make different predictions with respect to pronoun postposing and other types of rightward movement, and a comparison of the two approaches should be considered in the future.

If prosodic structure and linearization are evaluated simultaneously by an OT grammar at Spell-Out, it follows that if a prosodic constraint that outranks LINCORR can be satisfied by violating LINCORR, linear order will be manipulated in response to these prosodic considerations.

Above, I showed that in Irish, pronoun postposing satisfies the prosodic markedness constraint STRONGSTART by manipulating linear order, indicating that this constraint outranks LINCORR. Pronoun postposing thus reflects a direct conflict between the linearization constraint LINCORR and the prosodic constraint STRONGSTART, where constraint ranking determines that a linear order consistent with LINCORR may be sacrificed to satisfy the higher-ranked prosodic constraint STRONGSTART.

#### **4.4. Pronoun postposing as constraint interaction**

OT grammars take an abstract input and generate an infinite set of possible outputs. The winning candidate is that which best satisfies the language-specific constraint hierarchy, which consists of a set of ranked constraints. If the hierarchical syntactic structure that is the output of the syntactic component of the grammar is the input to an OT evaluation at the Spell-Out of each phase, the candidate set should include a set of candidates that manipulate linear order, as well as the various possibilities for prosodic structure assignment.

When a sentence with a weak object pronoun and an adjunct is given as input to the phonology at the Spell-Out of the  $\nu$ P phase, potential candidates are generated which satisfy the constraints differently: both prosodic structure and linear order can be manipulated. Constraint ranking determines which candidate emerges as optimal. The following tableau illustrates the preference for pronoun postposing when STRONGSTART outranks LINCORR. In this tableau, as well as those that follow, the input to the tableau is the abstract syntactic structure, and the candidates

represent possible outputs that are fully linearized and specified for prosodic structure (note bracketing: { } =  $\varphi$ ; ( ) =  $\omega$ ):

(17) Tableau illustrating pronoun postposing

$\nu\text{P}[\mu\text{P}[\acute{e} \text{ VP}[\text{Adv}[\text{ar\'e}\acute{\text{i}}\text{r}}]]]]$	STRONGSTART	LINCORR
a. $\varphi$ { (ar\'e}\acute{\text{i}}\text{r) \acute{e}}		\acute{e}
b. { \acute{e} (ar\'e}\acute{\text{i}}\text{r) }	\acute{e}!	

However, if a full DP rather than a weak pronoun is the object, no prosodic constraint is violated. STRONGSTART is satisfied because the noun is parsed as a  $\omega$ . Postposing the DP object would violate LINCORR gratuitously:

(18) Tableau illustrating gratuitous violation of LinCorr when a  $\omega$  is postposed

$\nu\text{P}[\mu\text{P}[\text{leabhar} \text{ VP}[\text{Adv}[\text{ar\'e}\acute{\text{i}}\text{r}}]]]]$	STRONGSTART	LINCORR
a. $\varphi$ { ( <b>leabhar</b> ) (ar\'e}\acute{\text{i}}\text{r) }		
b. { (ar\'e}\acute{\text{i}}\text{r) ( <b>leabhar</b> ) }		leabhar!

Other possible repairs for STRONGSTART can similarly be ruled out by constraint ranking. For example, the constraint MATCH( $\omega$ ,lex) is a syntax-prosody correspondence constraint that desires lexical words to be parsed as  $\omega$  (Selkirk 1995, 2009, to appear). If this constraint is ranked above LINCORR, it will eliminate the candidate where the weak pronoun is promoted to  $\omega$  status to satisfy STRONGSTART:<sup>8</sup>

(19) MATCH( $\omega$ ,lex): assign one violation mark for every prosodic word ( $\omega$ ) in phonological representation that does not correspond to a lexical word in syntactic constituent structure. (after Selkirk 1995, 2009, to appear)

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<sup>8</sup> However, promotion of the weak pronoun and adjunction onto a preceding  $\omega$  appear to be available repairs in cases where pronoun postposing does not occur and the weak pronoun remains in canonical object position (see section 5). As mentioned previously, pronoun postposing is an optional process for many speakers. See section 5.7 for a brief discussion of optionality.

(20) Tableau illustrating  $\text{MATCH}(\omega, \text{lex}) \gg \text{LINCORR}$

$\nu\text{P}[\mu\text{P}[\acute{e} \nu\text{P}[\text{Adv}[\text{ar\'e}ir]]]]$	STRONGSTART	$\text{MATCH}(\omega, \text{lex})$	LINCORR
a. $\varphi \{ (\text{ar\'e}ir) \acute{e} \}$			$\acute{e}$
b. $\{ (\acute{e}) (\text{ar\'e}ir) \}$		$(\acute{e})!$	

Similarly, assuming that the phase- $\varphi$  correspondence is governed by a violable constraint, ranking this constraint over LINCORR eliminates the candidate which fails to parse the  $\nu\text{P}$  phase as a prosodic constituent  $\varphi$ :

(21)  $\text{SOD}=\varphi$ : assign one violation mark for every Spell-Out domain of a phase in syntactic constituent structure that is not spelled-out as a  $\varphi$  in the phonological representation.

(22) Tableau illustrating  $\text{SOD}=\varphi \gg \text{LINCORR}$

$\nu\text{P}[\mu\text{P}[\acute{e} \nu\text{P}[\text{Adv}[\text{ar\'e}ir]]]]$	STRONGSTART	$\text{SOD}=\varphi$	LINCORR
a. $\varphi \{ (\text{ar\'e}ir) \acute{e} \}$			$\acute{e}$
b. $\acute{e} (\text{ar\'e}ir)$		$\nu\text{P}!$	

Finally, the weak pronoun cannot adjoin to the right to form a recursive  $\omega$  with the adjunct because of high-ranking  $\text{MATCH}(\text{lex}, \omega)$ :

(23)  $\text{MATCH}(\text{lex}, \omega)$ : assign one violation mark for every lexical word in syntactic representation that does not correspond to a  $\omega$  in the phonological representation. (after Selkirk 1995, 2009, to appear)

(24) Tableau illustrating  $\text{MATCH}(\text{lex}, \omega) \gg \text{LINCORR}$ <sup>9</sup>

$\nu\text{P}[\mu\text{P}[\acute{e} \nu\text{P}[\text{Adv}[\text{ar\'e}ir]]]]$	STRONGSTART	$\text{MATCH}(\text{lex}, \omega)$	LINCORR
a. $\varphi \{ (\text{ar\'e}ir) \acute{e} \}$			$\acute{e}$
b. $\{ (\acute{e} \text{ar\'e}ir) \}$		$(\acute{e} \text{ar\'e}ir)!$	

Under this analysis, pronoun postposing, which involves the violation of the linear correspondence constraint LINCORR, is motivated by the desire to satisfy the prosodic

<sup>9</sup> I am ignoring the possibility of creating recursive  $\omega$  structure here. See Selkirk (1995) for discussion of recursive structure in the adjunction of weak elements to  $\omega$ .



markedness constraint **STRONGSTART** while at the same time satisfying the syntax-prosody correspondence constraints **MATCH(lex,ω)**, **MATCH(ω,lex)**, and **SOD=φ**. Given the various possible ways to satisfy **STRONGSTART**, postposing emerges as optimal because **LINCORR** is ranked below each of these constraints.

## 5. Pronoun postposing in other environments

### 5.1. Subject pronouns

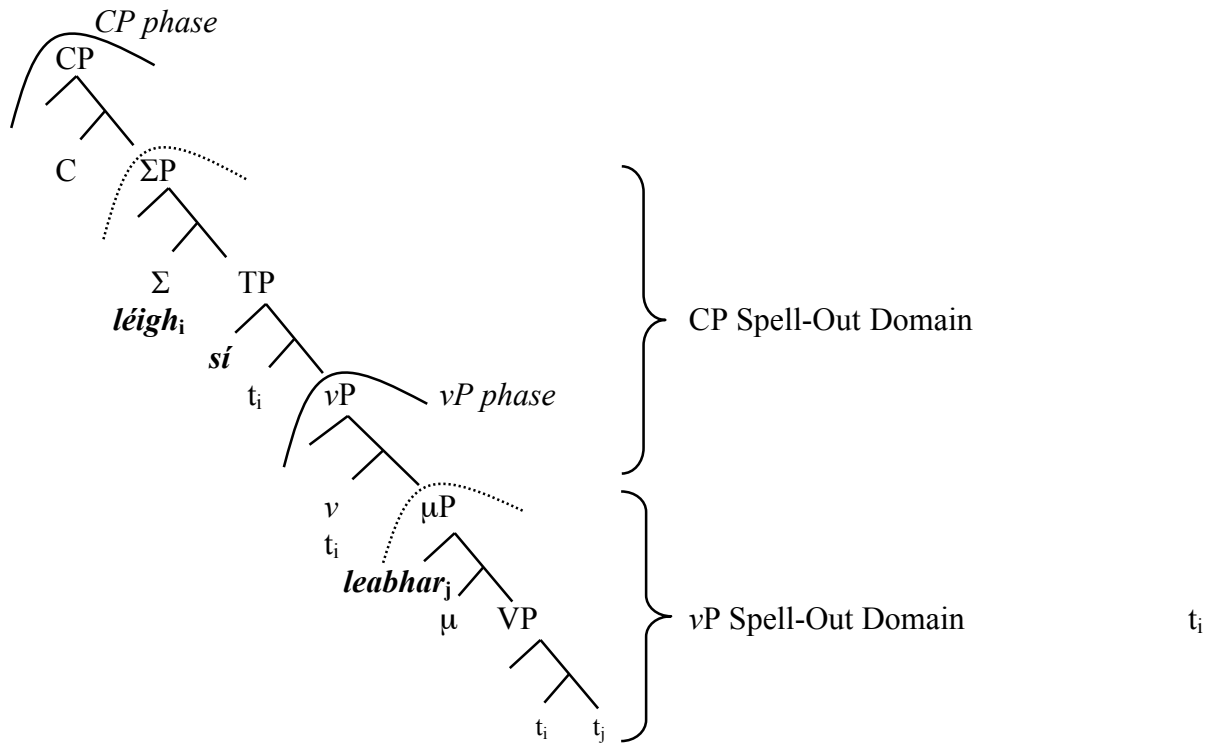
Pronoun postposing does not affect all weak pronouns. For example, weak subject pronouns never postpose, even when they are followed by an object or other element:

- (25) a. Léigh sí leabhar.  
read she book  
'She read a book.'  
b. \* Léigh leabhar sí.  
read book she  
'She read a book.'

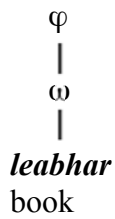
The prosodic phase-based analysis presented here predicts that postposing will not occur when there is no prosodic motivation to do so: more specifically, when the weak pronoun is not at left edge of a  $\varphi$ , **STRONGSTART** will not be violated and there will be no motivation to incur a violation of **LINCORR** by postposing the pronoun. There is good evidence that subject pronouns are phonological clitics that attach to the verb on their left, and are therefore not at the left edge of any prosodic domain (Chung & McCloskey 1987, Carnie 1995).

Subjects in Irish are above  $v$ ; I assume that the subject is in Spec,TP as discussed previously. Subjects in Irish will therefore not be spelled-out in the  $vP$  phase but in the CP phase with the verb. Unlike object pronouns, weak subject pronouns will not linearize to the left edge of a  $\varphi$ :

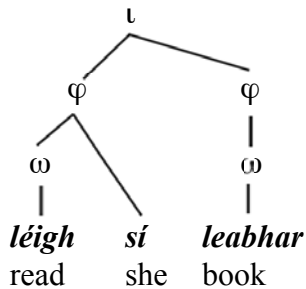
(26) a. Phases and Spell-Out Domains



b. Spell-Out of vP phase (Phase  $\rightarrow \varphi$ ): STRONGSTART is satisfied



c. Spell-Out of CP phase (Phase  $\rightarrow \varphi$ ; Clause  $\rightarrow \iota$ ): STRONGSTART is satisfied<sup>10</sup>



<sup>10</sup> See Selkirk (2009, *to appear*) for discussion of clause to intonational phrase mapping, where it is proposed that CPs correspond to  $\iota$ .

When the CP phase is spelled-out, there will not be any violation of STRONGSTART: the subject pronoun adjoins onto the left onto the verb, satisfying all of the constraints considered in the previous section. There is no prosodic advantage to postponing the subject pronoun, and so it remains in place.

## 5.2. Ditransitives

Ditransitives in Irish have the structure DP-PP, as in the following sentence:

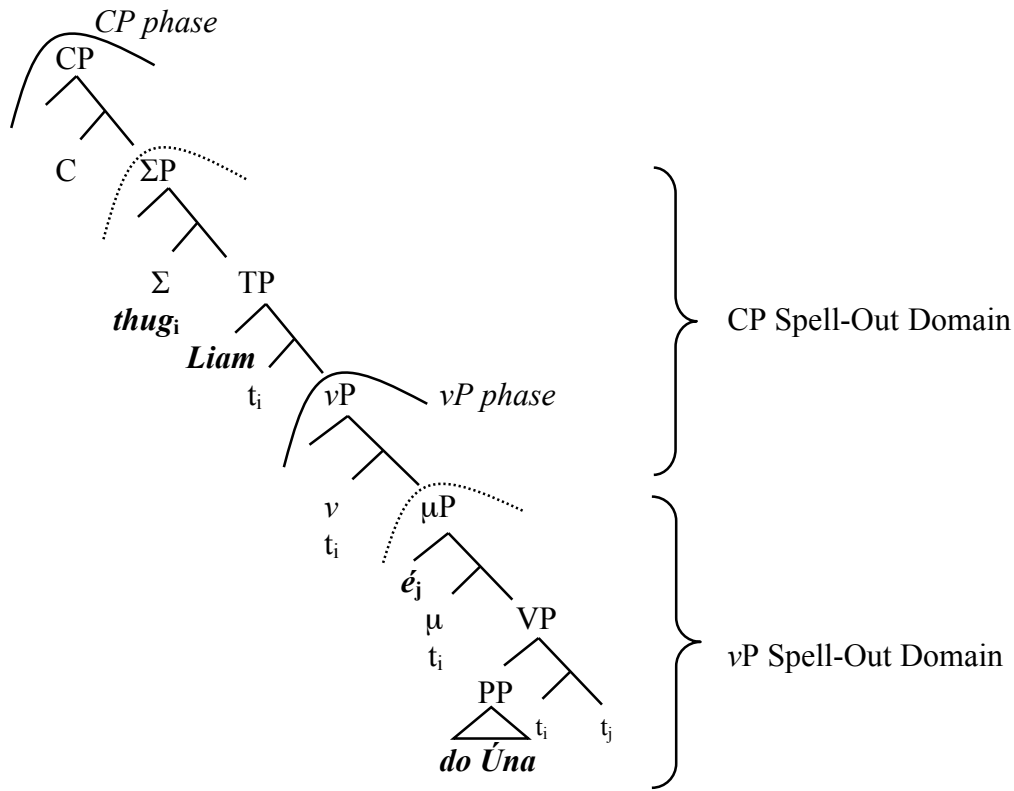
- (27) Thug Liam leabhar do Úna.  
gave Liam book to Úna  
'Liam gave a book to Una.'

If the direct object is a weak pronoun, it can postpone, just as when the PP is an adjunct:

- (28) a. ?Thug Liam é do Úna  
gave Liam it to Úna  
'Liam gave it to Una.'  
b. Thug Liam do Úna é.  
gave Liam to Úna it  
'Liam gave it to Una.'

Assuming that ditransitives in Irish have a structure such as the following, it is not surprising that weak pronoun objects in ditransitive sentences postpone: at Spell-Out of the  $vP$  phase, the weak pronoun object will be at the left-edge of the phase-level  $\varphi$ , just as in sentences with a VP adjunct:

(29) Structure of a ditransitive sentence with a weak pronoun object



The preference for postposing in this environment can be illustrated in the following tableau:

(30) Postposing in a ditransitive sentence

$vP[\mu P[\acute{e} VP[PP[do \acute{U}na]]]]$	STRONGSTART	LINCORR
a. $\varnothing \{ (do \acute{U}na) \acute{e} \}$		$\acute{e}$
b. $\{ \acute{e} (do \acute{U}na) \}$	$\acute{e}!$	

This pattern supports the assertion that pronoun postposing is motivated by prosodic considerations rather than strictly syntactic ones: even given different argument conditions, pronoun postposing is predicted to occur whenever the weak pronoun would be at the left edge of  $\varphi$ .

### 5.3. Small clauses and progressives

The above claim is further supported by the availability of postposing in sentences with small clauses and progressive phrases in object position (Chung & McCloskey 1987, Duffield 1995).

The subjects of these clauses normally precede the verbal element:

(31)a. Ba annamh [ Liam ina thost]  
was rare Liam silent  
'Liam was rarely silent.'

b. \*Ba annamh [ ina thost Liam]  
was rare silent Liam  
'Liam was rarely silent.'

(32)a. Chuala mé [ Liam ag ceol ].  
heard I Liam PRT singing  
'I heard Liam singing.'

b. \*Chuala mé [ ag ceol Liam ].  
heard I PRT singing Liam  
'I heard Liam singing.'

However, when the subject of the small clause or progressive phrase is a weak pronoun, the pronoun may be postposed:

(33)a. Ba annamh [ é ina thost]  
was rare him silent  
'He was rarely silent.'

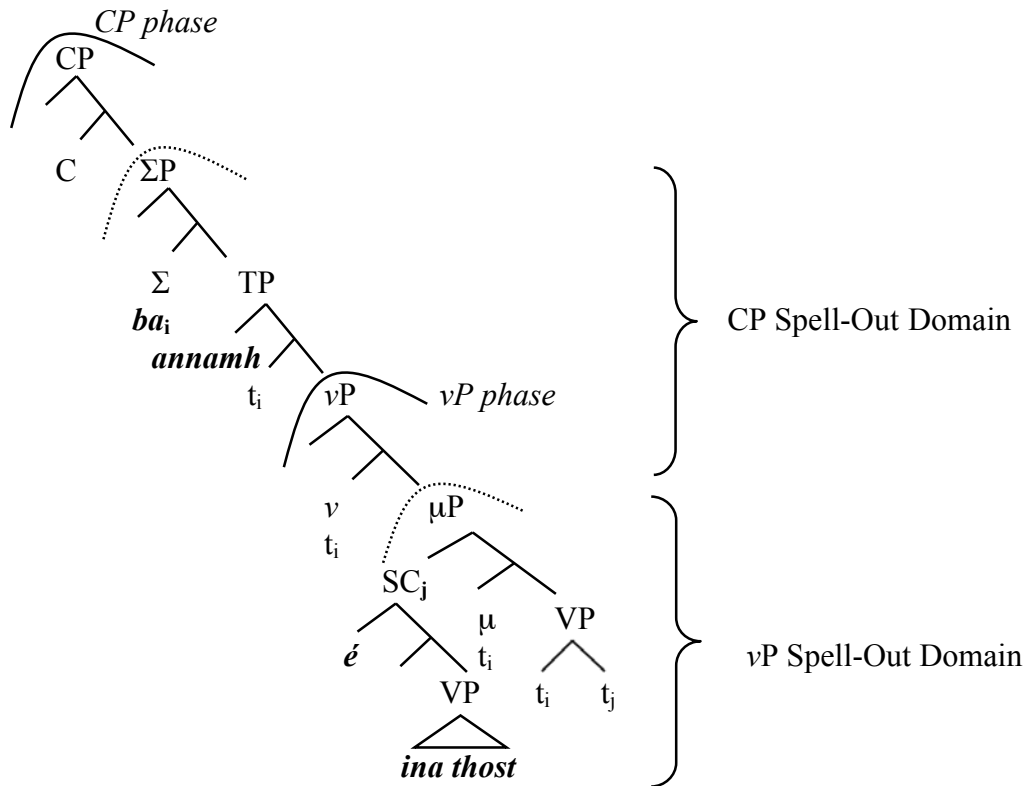
b. Ba annamh [ ina thost é].  
was rare silent him  
'He was rarely silent.' (Chung & McCloskey 1987)

(34)a. Chuala mé [ é ag ceol ].  
heard I him PRT singing  
'I heard him singing.'

b. Chuala mé [ ag ceol é].  
heard I PRT singing him  
'I heard him singing.' (Duffield 1995)

Once again, this pattern is expected provided that the small clause and the progressive phrase are syntactically in object position,  $\mu$ P. This can be seen in the following structure for a sentence with a small clause in object position:

(35) Structure of a sentence with a small clause and weak pronoun object



As in the previous structures, the weak pronoun is at the left edge of the vP Spell-Out domain, and can avoid a violation of STRONGSTART if it is postposed:

(36) Postposing in a ditransitive sentence

$vP[\mu P[SC[\acute{e} \text{ ina thost}]_{VP}[t_i t_j]]]$	STRONGSTART	LINCORR
a. $\{ (\text{ina thost}) \acute{e} \}$		$\acute{e}$
b. $\{ \acute{e} (\text{ina thost}) \}$	$\acute{e}!$	

Interestingly, pronoun postposing is blocked in small clauses and progressives that are selected by *agus* ‘and’ or *ach* ‘but’ (Chung & McCloskey 1987, Duffield 1995, Adger 1997):

- (37) a. Agus [  $\acute{e}$  ina thost].  
 and him silent  
 ‘And him silent.’  
 b. \*Agus [ ina thost  $\acute{e}$ ].  
 and silent him  
 ‘And him silent.’

- (38) a. Agus [ é ag ceol].  
           and him PRT singing  
           ‘And him singing.’  
       b.\*Agus [ ag ceol é].  
           and PRT singing him  
           ‘And him singing.’

This fact may follow from the above analysis: if *agus* ‘and’ is spelled-out in the same phase as the small clause or the progressive, the weak pronoun will not surface in  $\varphi$ -initial position and will not need to postpose. However, *agus* ‘and’ and *ach* ‘but’ are also weak functional elements, and it may be asked why these elements do not postpose. One possibility is that the structure of these constructions is deficient, such that there is no  $v$  and therefore no  $vP$  phase. It is possible, therefore, that the weak element is at the left edge of  $\iota$  rather than  $\varphi$ , being at the left edge of a clause (see Selkirk 2009, to appear for discussion of clause- $\iota$  correspondence). As  $\varphi$  and  $\iota$  are different prosodic categories, it is possible that they have different requirements for the status of the material that may appear at their edges, such that STRONGSTART may be satisfied differently when the violation is at the left edge of an  $\iota$ . For instance, while postposing may be the favoured repair at  $\varphi$ -level, promotion to  $\omega$  status may be preferred at  $\iota$ -level, given the right set of assumptions with respect to the constraint set and their ranking. In *agus/ach* constructions, postposing may be blocked in favour of promotion to  $\omega$  status because the weak elements are  $\iota$ -initial. See section 5.5 for additional evidence for a distinction between  $\iota$ - and  $\varphi$ -initial weak elements.

#### 5.4. Autonomous verbs

McCloskey (2007) argues that autonomous verbs are a class of verbs that have overt objects and null subjects. They are similar, but not identical to, agentless passives in English (examples from McCloskey 2007:826):

- (39) a. Tógadh suas an corpán ar bharr na haille.  
 raise.PST.AUT up the body on top the cliff.GEN  
 ‘The body was lifted to the top of the cliff.’  
 b. Scaoileadh amach na líonta.  
 release.PST.AUT out the.PL nets  
 ‘The nets were let out.’

When the object is a weak pronoun, pronoun postposing is possible if the sentence contains an X element (Ó Siadhail 1989, McCloskey 2007:826):

- (40) a. Cuirtear iad i mboscaí.  
 put.PRES.AUT them in boxes  
 ‘They are put in boxes.’  
 b. Cuirtear i mboscaí iad.  
 put.PRES.AUT in boxes them  
 ‘They are put in boxes.’

This is expected if, as argued by McCloskey (2007), the subject of the autonomous verb remains in object position (assumed here to be Spec, $\mu$ P) rather than raising to subject position as in passive constructions in languages like English. This means that the object will be spelled-out in the  $\nu$ P phase with the adjunct, just as in VSOX sentences with non-autonomous verbs and overt subjects. They are in initial position of the Spell-Out domain of the  $\nu$ P phase, and therefore violate STRONGSTART. As elsewhere, the pronouns postpose to satisfy this constraint.

### 5.5. Non-finite clauses

Non-finite clauses are formed using the verbal noun, as was the case with progressives. However, the syntax of these clauses differs from the syntax of the progressive clause. The clauses variably can take either PRO or an overt subject, and can additionally take an overt object, depending on the dialect of the speaker. In sentences with an overt object, the verbal noun is preceded by the particle *a*. The following examples show the patterns exhibited in southern Irish dialects (Connacht and Munster): (41a) shows the verbal noun without the particle *a* when the subject is PRO, (41b) shows the appearance of the particle when the subject is overt and



distinct from the subject of the matrix clause, (41c) shows the presence of the particle with PRO as the subject and an overt preverbal direct object, and (41d) shows SVO order when both the subject and the object are overt. Note that the postverbal object takes genitive case (examples are from Bondaruk 2006:1847):<sup>11</sup>

- (41) a. Ba mhaith liom [PRO fanacht]. PRO V  
 COP good with-me stay.VN  
 ‘I would like to stay.’
- b. Ba mhaith liom [é a fhanacht]. S PRT V  
 COP good with-me him PRT stay.VN  
 ‘I would like him to stay.’
- c. Ba mhaith liom [PRO an doras a phéinteáil]. PRO O PRT V  
 COP good with-me the door PRT paint.VN  
 ‘I would like to paint the door.’
- d. Ba mhaith liom [sibh a phéinteáil an dorais]. S PRT V O-GEN  
 COP good with-me you.PL PRT paint.VN the door.GEN  
 ‘I would like you to paint the door.’

Northern dialects (Ulster) behave similarly, except that the SVO order in (41d) is ungrammatical: the object always occurs preverbally, and without genitive case (Ó Siadhail 1989:257):

- (42) Ba mhaith liom [sibh an doras a phéinteáil]. S O V  
 COP good with-me you-PL the door.NOM PRT paint.VN  
 ‘I would like you to paint the door.’

Pronoun postposing is never allowed within a non-finite clause, either for object or subject pronouns (Chung & McCloskey 1987:229):

- (43) a. Rinne sé iarracht é a dhéanamh.  
 do.PAST he attempt it PRT do.VN  
 ‘He tried to do it.’
- b. \*Rinne sé iarracht a dhéanamh é.  
 do.PAST he attempt PRT do.VN it  
 ‘He tried to do it.’

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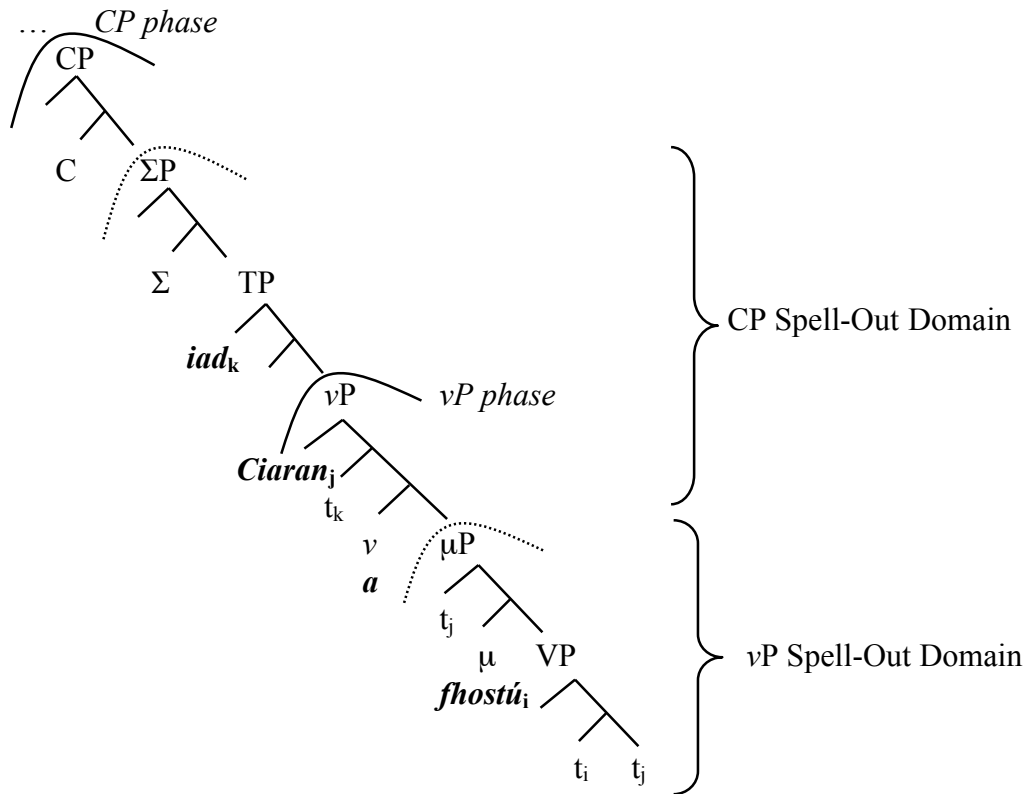
<sup>11</sup> Note that in some dialects, a weak object pronoun *é* ‘he/it’ and the *a* particle can appear either as a possessive particle or as a composite object pronoun. For example, *é a fhanacht* ‘it to stay’ can become either *a fhanacht* ‘its staying’ (Northern dialects) or *á fhanacht* ‘it.to stay’ (Southern dialects) (Doyle 2002, Bondaruk 2006).

- (44) a. Ba mhaith liom iad Ciarán a fhostú.  
 COP good with.me them Ciaran PRT hire.VN  
 ‘I would like them to hire Ciaran.’
- b. \*Ba mhaith liom Ciarán a fhostú iad.  
 COP good with.me Ciaran PRT hire.VN them.  
 ‘I would like them to hire Ciaran.’

Note that the SVO word order found in Southern dialects does not result from pronoun postposing: full DP objects occur postverbally in this context, and are marked with genitive case, suggesting that objects occur in this position for syntactic rather than prosodic reasons. Similarly, full DP objects and weak pronominal objects behave identically with respect to linear order when in preverbal position.

The impossibility of pronoun postposing in these structures can be accounted for using the phase-based analysis proposed here. Following Bondaruk (2006) and McCloskey (2009), the particle *a*, when present, occupies *v*. There is evidence that both subjects and the objects in non-finite clauses are higher than *v*, while the verb is lower than *v*: the object raises from its position in VP and raises through Spec, $\mu$ P up to Spec, $v$ P and the subject raises from Spec, $v$ P to Spec,TP. This structure is illustrated in the following tree for the non-finite clause in(44a):

(45) Structure of an embedded non-finite clause with pre-verbal subject and object



Syntactic arguments for this structure include the possibility of quantifier float and possibility to realize other complements post-verbally (see McCloskey 2009 for discussion).

Because the subject and object are realized above  $v$ , the verbal noun will be spelled-out in the vP phase, and the subject and object of the non-finite clause will be spelled out in the CP phase of the embedded clause. Neither the subject nor the object will then be initial in the  $\varphi$  that corresponds to the vP Spell-Out domain, though they may be initial in the CP Spell-Out domain. Instead of postposing, the subject and object are promoted to  $\omega$  status and are pronounced in their stressed, unreduced form (McCloskey 2008).

If the Spell-Out domain corresponding to the CP phase is mapped as an  $\iota$  (Selkirk 2009, to appear), an analysis along the same line as the proposal for *agus/ach* constructions discussed in 5.3 is possible. Because the subject and object have moved to positions above  $v$ , they will be

spelled out with the CP phase, and are therefore at the left edge of  $\iota$  rather than  $\varphi$ . As for *agus/ach* constructions, promotion rather than postposing appears to be the preferred repair for weak  $\iota$ -initial elements. While a full analysis is not possible here, this connection between two constructions in which postposing is blocked seems promising.

### 5.6. Partial Postposing

Another interesting property of pronoun postposing is its behaviour in sentences with multiple adjuncts. In such sentences, the weak pronoun need not postpose to the right edge of the sentence, but can follow any one of the adjuncts:

(46) Weak pronouns follow an adjunct, either medially or finally

- a. ? Léigh Liam [ *é* ar an traein aréir].  
read Liam it on the train last-night
- b. Léigh Liam [ ar an traein *é* aréir].  
read Liam on the train it last-night
- c. Léigh Liam [ ar an traein aréir *é*].  
read Liam on the train last-night it  
'Liam read it on the train last night.'

(47) Multiple possibilities in sentences with multiple adjuncts (Ó Siadhail 1989:209)

- a. ? Fágadh [ *é* ina loighe ar an talamh taobh thiar den scioból aréir]  
left it lying on the ground behind the barn last-night
- b. Fágadh [ ina loighe *é* ar an talamh taobh thiar den scioból aréir]  
left lying it on the ground behind the barn last-night
- c. Fágadh [ ina loighe ar an talamh *é* taobh thiar den scioból aréir]  
left lying on the ground it behind the barn last-night
- d. Fágadh [ ina loighe ar an talamh taobh thiar den scioból *é* aréir]  
left lying on the ground behind the barn it last-night
- e. Fágadh [ ina loighe ar an talamh taobh thiar den scioból aréir *é*]  
left lying on the ground behind the barn last-night it  
'It was left lying on the ground behind the barn last night.'

The prosodic constraint STRONGSTART is equally satisfied when the weak pronoun is postposed to any of the possible positions in the above examples, as postposing to any position removes this violation. Similarly, the definition of the linearization constraint LINCORR, as defined in section 4.3, is violated only once by the displacement of the weak pronoun, and is not sensitive

to the degree of displacement. This analysis, as defined by the interaction between **STRONGSTART** and **LINCORR**, predicts that each position of the weak pronoun in the above sentences should be equally good, and predicts either that the positioning of the weak pronoun is optional (see also discussion in the next section), or that it is dependent on other factors such as information structure not considered here (see Adger 1997, Mulkern 2003, this volume).

### 5.7. Optionality

For many speakers, pronoun postposing is an optional process, with only a dispreference for leaving the pronoun in canonical object position. However, in all environments where pronoun postposing is possible, the pronoun may alternatively be realized in canonical object position, just like full DP and strong pronoun objects. I have argued in this paper that pronoun postposing is motivated by a prosodic constraint **STRONGSTART** that disprefers weak elements in  $\varphi$ -initial position. This constraint is violated when the weak pronoun is initial within the  $\varphi$  that corresponds to the  $vP$  phase, and can be satisfied by postposing the pronoun.

However, there are other possible repairs that can satisfy **STRONGSTART** without violating **LINCORR**. One possibility is for the weak pronoun to be phrased with the prosodic word to its left (likely the subject or the verb). McCloskey (1999:206) proposes that this is the correct prosodic representation for a sentence with an unpostposed pronoun, as below:

(48)  $\varphi$ (Léigh Liam é)  $\varphi$ (aréir)

This structure satisfies **STRONGSTART**, but violates the constraint on phase-phase correspondence proposed above (**SOD**= $\varphi$ ), by placing a prosodic phrase boundary between the two elements that are contained within the  $vP$  phase.

In OT, typology is determined by the permutation of constraint rankings: each possible ranking is predicted to be a possible grammar. OT predicts that constraint ranking will decide among

possible repairs to STRONGSTART, such that there should be a ranking that will favour each of these repairs. For example, ranking LINCORR over SOD= $\varphi$  favours postposing, while the opposite ranking favours leftward phrasing. The observation that pronoun postposing is only one of the possible prosodic repairs for STRONGSTART actually provides support for the OT analysis developed here: optionality within a single language may be analysed as the existence of multiple grammars, where the ranking of some constraints in the language are variable (see Anttila 1997 and Boersma 1997 for two proposals for modelling optionality and variation in OT). While a formal analysis of optionality in pronoun postposing is beyond the scope of this paper, the availability of multiple repairs for the same prosodic markedness constraint suggests that the prosodic account is on the right track.

## 6. Conclusion

In this paper, I have developed a prosodic account of pronoun postposing in Irish. More specifically, this account proposes that pronoun postposing derives from the interaction between prosodic and linearization constraints at Spell-Out, rather than from prosodically-conditioned movement in the syntax (Chung & McCloskey 1987, Adger 1997, Doyle 1998) or purely syntactic movement (Duffield 1995). This account clearly defines the environment for pronoun postposing on the basis of the independently motivated STRONGSTART constraint. I showed that this correctly accounts for the main postposing environment (finite clauses with VP adjuncts), and makes clear predictions about when pronoun postposing will and will not occur. I extended the account to a number of environments where pronoun postposing is possible (small clauses, progressive clauses, autonomous verbs) and showed that the account also accounts for the environments in which pronoun postposing is not possible (subject pronouns, *agus/ach* constructions, non-finite clauses).

An advantage of the OT analysis given here is that the analysis sees pronoun postposing as one of many possible phonological responses to STRONGSTART: other languages (with different constraint rankings) may satisfy this constraint in different ways. I have also shown that while pronoun postposing is optional, the possibilities of leaving the pronoun in canonical object position, either by promoting the weak pronoun (as in non-finite clauses) or adjoining the pronoun to a  $\omega$  to its left (as with unpostposed pronouns), represent alternative methods for satisfying STRONGSTART. In this way, the optionality of the process actually provides support for the analysis which sees pronoun postposing as prosodically motivated.

Finally, the analysis avoids some of the undesirable characteristics of alternative analyses that derive postposing in the syntax, including rightward syntactic movement (Chung & McCloskey 1987, Doyle 1998), remnant movement (Duffield 1995; see McCloskey 1999 for difficulties with this analysis), and phonologically-conditioned syntactic movement (Adger 1997). Instead, the postposing patterns derive from constraint interaction at Spell-Out, where linearization interacts with prosodic structure assignment.

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