Variation in Mainland Scandinavian Object Shift: 
A Prosodic Analysis

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Despite decades of research, debate continues over the analysis of Object Shift in Mainland Scandinavian, and all syntactic and information-structural accounts have run into empirical and/or conceptual problems. We argue that this debate can be resolved by recognizing that Object Shift is, in fact, a prosodic phenomenon. Our analysis builds on the observation that varieties with optional Object Shift (most Swedish dialects, South Danish dialects (e.g., Ærø)) also have a tone accent contrast. The in-situ word order in these varieties is licensed because tonal accent creates a prosodic domain that makes the incorporation of weak pronouns possible.

Keywords: Object Shift, dialect variation, optionality, tone accent contrast, Holmberg’s Generalization, adverb alignment, syntax-prosody interface

1 Introduction

It is well-known that Mainland Scandinavian weak-pronoun Object Shift (OS) is optional in certain Mainland Scandinavian dialects and obligatory in others.

(1) Standard Danish

a. Peter så den ikke.
   Peter saw it not
   ‘Peter didn’t see it.’

b. *Peter så ikke den.
   Peter saw not it

The research for this work was funded by the Israel Science Foundation grant 302/13 entitled “Prosody – A Source of Word-Order Microparameters,” to which both Gunlög and Björn contributed. What inspired this project on the correlation between optional OS and tone was the observation by Sofie Raviv, then a graduate student at Ben Gurion University, that a friend of hers from Ærø had optional OS and “sounded like a Swede”; the search for a possible correlation is also due to an independent suggestion made by Sten Vikner. Parts of this article were presented at the 25th Scandinavian Conference of Linguistics in Reykjavík; at workshops in Budapest, Lund, Göteborg, Tromsø, and Trondheim; and at the ISF-funded workshop at Ben Gurion University, DGFS in Saarbrücken, GLOW in Leiden, and NINJAL ICPP in Tachikawa. We would like to thank the participants at those occasions, the anonymous reviewers, and the Gothenburg University group (Elisabet Engdahl, Filippa Lindahl, Ida Larsson, Maia Andréasson, and Nick Kalivoda) for valuable input. This research could not have taken place without the help of our many native-speaker consultants—in particular, Kisser Hoffmann Kaplan, Ruth Abramsson, Lena Wienecke Andersen, and the Section of Dialectology at the University of Copenhagen (Ærø Danish); Grethe Lollikke (Falster); Michelle Hammarstrand and Stefan Rosell (Swedish); and the Fenno-Swedish section of the Institute for the Languages of Finland.
(2) **Swedish**

a. Peter såg den inte.
   Peter saw it not

b. Peter såg inte den.
   Peter saw not it

(1a) illustrates OS, and (1b) shows that leaving the weak pronoun in situ is ruled out in Standard Danish. (2a–b) show that in Swedish both word orders are possible.

Swedish and Danish differ in another property: whereas Swedish distinguishes two tonal accents, Standard Danish does not. OS is also optional in certain South Danish dialects, among them the dialect spoken on the island of Ærø. Surprisingly, tonal distinctions are also present in this dialect. We propose that these two dialectal variations are connected: optional OS is enabled by the presence of tonal distinctions. The idea that tonal accent identifies prosodic units can be found already in Haugen 1967:198. According to Haugen, “[T]one serves to join successive elements more closely than would otherwise be the case.” This is not to say that a variety with tone accent distinctions necessarily has optional OS, only that it might—essentially, our main claim is that the presence of tonal accents enables optional OS. In fact, many dialects of Norwegian do not have optional OS despite having a tone accent distinction.

Elaborating on previous work by Erteschik-Shir and Josefsson, this article proposes a phonological analysis of optional and obligatory OS that accounts for this pattern of variation, thus providing further evidence for the phonological analysis of OS.

The standard case of OS in Mainland Scandinavian applies to a weak object pronoun, moving it from the canonical object position following an adverb, as shown in (3a), to a position adjacent to the finite verb or the subject, as shown in (3b) and (3c), respectively.\(^1\)

(3) **Standard Danish**

a. Peter mødte ikke Mette.
   Peter met not Mette
   ‘Peter didn’t meet Mette.’

b. Peter mødte ham ikke.
   Peter met him not
   ‘Peter didn’t meet him.’

c. Derfor mødte Peter ham ikke.
   therefore met Peter him not
   ‘Therefore Peter didn’t meet him.’

OS is subject to Holmberg’s Generalization, which restricts it to structures that have undergone verb movement. This is shown in (3) and (4).

\(^1\) According to Selkirk (1996:193), weak pronoun forms in English are unstressed and “display the properties of stressless syllables: Vowel reduction, appearance of syllable sonorants, loss of onset ‘h’, etc.” Mainland Scandinavian weak pronouns display similar properties. Note that in both English and Mainland Scandinavian, weak pronouns may be pronounced fully in careful speech. We believe that this is best regarded as a matter of performance and does not detract from their status as being weak.
(4) a. Peter har ikke mødt ham.
   Peter has not met him
b. *Peter har ham ikke mødt.
   Peter has him not met

(5) a. . . . at Peter ikke mødte ham.
   . . . that Peter not met him
   ‘. . . that Peter didn’t meet him.’
b. * . . . at Peter ham ikke mødte.
   . . . that Peter him not met

In (3b–c), both the verb and the object have moved. In the sentences in (4) and (5), neither the verb nor the object has moved. In (4b), the presence of the auxiliary blocks OS, and (5b) illustrates the lack of verb movement in subordinate clauses.

The phenomenon of OS in general and Holmberg’s Generalization in particular have been intriguing to linguists working within the Minimalist Program since Holmberg 1986, in view of the restriction (in Scandinavian languages) of OS to structures that have undergone verb movement. This type of restriction is problematic since there is no obvious way of linking the occurrence of one rule to the occurrence of another. Despite the challenge, the problem has engendered numerous innovative syntactic analyses. Prominent examples are found in Åfarli 1995, 1997, 2010, Bobaljik 2002, Christensen 2003, Fox and Pesetsky 2005, Nilsen 2003, Vikner 2012, and Vogel 2006. Bobaljik (2002), for example, proposes a copy theory of movement that allows for either copy to be pronounced. OS occurs in the syntax, yet morphological adjacency constraints determine which copy is pronounced at PF. This is an ingenious way to allow for a purely syntactic account of OS, sensitive to phonology (adjacency), without PF filters on syntactic derivation. However, if the motivation for OS is phonological, as Bobaljik argues, forcing movement in the syntax makes little sense. Therefore, here we present a purely phonological analysis of OS.

That Information Structure and interpretation affect OS is recognized by Holmberg himself (Holmberg 1999) and implemented in Chomsky 2001b. Information Structure and interpretation also play a role in many other accounts (e.g., Anderssen and Bentzen 2012, Andréasson 2012, Diesing and Jelinek 1995, Erteschik-Shir and Strahov 2004, Josefsson 2010, 2012, and Nilsen 1997). Most works on OS also take into account the prosodic features of the phenomenon. Prominent among these are Erteschik-Shir 2005a,b, Hellan 1994, Holmberg 1999, Hosono 2010, and Josefsson 2012. Holmberg (1999), for example, posits the feature [−foc] to trigger OS. According to Holmberg, [−foc] is a phonological feature and OS occurs in a postsyntactic component (Stylistic Syntax).

Chomsky’s (2001b) account—closely based on Holmberg’s (1999)—recognizes that OS has phonological properties, but Chomsky claims that whereas certain displacement rules do not involve surface semantic effects and can therefore be assumed to be phonological, OS is driven by the semantic interpretation of the shifted object and must, at least partially, fall within narrow syntax. Chomsky employs the feature Int’ (an interpretive feature) to distinguish languages with OS from languages without it. Chomsky’s approach allows for optionality, but the fact that certain language varieties or dialects allow OS, whereas others do not, is left unaccounted for.
Following Åfarli (1995, 1997, 2010), Erteschik-Shir (2005a,b), and Josefsson (1992, 1994, 2010, 2012), we argue that OS in Mainland Scandinavian follows from the requirement that a phonologically weak pronoun must prosodically incorporate into a legitimate host.² This predicts OS, but not, as these authors note, the fact that OS is obligatory in Standard Danish but optional in Standard Swedish and certain Danish dialects, which allow not only OS as in (6a) but also the unshifted order in (6b), akin to the order with full DPs as in (6c).

(6) Swedish
   a. Peter såg den inte.
      Peter saw it not
      ‘Peter didn’t see it.’
   b. Peter såg inte den.
      Peter saw not it
   c. Peter såg inte Anna.
      Peter saw not Anna
      ‘Peter didn’t see Anna.’

Roughly, we claim that the presence of tonal accent facilitates the creation of higher-level prosodic units that enable the pronunciation of the unshifted order in (6b). Descriptively, we refer to the high-level prosodic units as tone accent units (TAUs). The tone accent varieties we focus on are Central Swedish and Ærø Danish, where OS is optional; we compare these with Standard Danish, which lacks tonal distinctions and in which OS is obligatory.

The article is organized as follows. In section 2, we offer Swedish and Ærø Danish data showing the correlation between tonal accents and OS. In section 3, we analyze TAUs and provide an explanation of how these units enable prosodic incorporation. In section 4, we offer an analysis of OS as well as the variation available in tonal dialects. We adopt the idea (e.g., Chomsky 2004) that adverbs are adjoined on a separate plane (3D-adjoined in our terms), and we argue that Optimality Theory (OT) constraints (Prince and Smolensky 2004) determine how the adverbs are phonologically linearized, accounting for both variations and Holmberg’s Generalization. We implement our analysis in a model where the only prosodic units between the level of the word and the intonational phrase are phonological phrases (e.g., Ito and Mester 2013). Furthermore, for purposes of exposition we make reference to Match Theory (Selkirk 2009, 2011), but we believe that the interaction between word order and tonal accents could be expressed equally well in other approaches to the syntax-phonology interface, such as those of Kalivoda (2018) and Truckenbrodt (1999).

In section 5, we examine Fenno-Swedish (spoken in Finland), Lolland-Falster Danish (spoken on two islands in southern Denmark), and Oevdalian (spoken in the northwestern part of Dalecarlia

² We limit our discussion to the incorporation of weak pronouns into a preceding host; we do not address incorporation of weak pronouns into a following host since this is not relevant to OS. An example of the incorporation of a weak pronoun into a following host is the procliticization of a weak subject pronoun into the following verb, as in (i).

(i) Danish
   Ja=mødte Peter i går.
   I met Peter yesterday
in Sweden), which have been thought to misbehave with respect to our claim. We demonstrate that such cases are in fact predicted by our account. Section 6 provides a conclusion.

2 Background and Basic Facts: The Cooccurrence of Optional OS and Tonal Accent

In this section, we provide data that illustrate the cooccurrence of optional OS and tonal accent. In section 2.1, we present relevant data from Swedish. In section 2.2, we show that the same generalizations hold for Ærø Danish, which is known to have tonal accent (described in detail in Kroman 1947).

2.1 Swedish: Optional OS and Tonal Accents

It has been claimed that OS is more or less obligatory in Swedish; see, for instance, Holmberg 1991:156 and Josefsson 1992. However, a more thorough investigation, presented in Josefsson 2003, 2010, shows that OS is optional in (Standard) Swedish. In Josefsson’s study, 26 native speakers of Swedish were asked to give grammaticality judgments of a number of shifted and unshifted sentences like (7a) and (7b).

(7)

Swedish

(a) Han är en riktig diva. Jag gillar inte honom.

he is a real diva I like not him

‘He is really a diva. I don’t like him.’

(b) Han är en riktig diva. Jag gillar honom inte.

he is a real diva I like him not

Sentence (7a) is unshifted; the negation precedes the object pronoun, inte honom ‘not him’, whereas the reverse holds for (7b), honom inte ‘him not’. The study showed that OS is optional with both mono- and disyllabic pronouns. No difference was found between speakers of different ages or dialects.

Most Swedish and Norwegian dialects, as well as some South Danish dialects, distinguish two tonal accents: Accent 1 and Accent 2. The accents can differentiate word pairs with two or more syllables (some dialects also show distinctions on monosyllables): for instance, 1anden (duck.the) ‘the duck’ and 2anden (spirit.the) ‘the spirit’. The tonal accent contours differ between dialects, but a typical Stockholm variant is shown in (8).

(8) Stockholm Swedish

<table>
<thead>
<tr>
<th>Word accent</th>
<th>Focus accent</th>
</tr>
</thead>
<tbody>
<tr>
<td>anden ‘the duck’</td>
<td>[1anden] → Accent 1 HL* L*H</td>
</tr>
<tr>
<td>(Riad 2013:184)</td>
<td>anden ‘the spirit’</td>
</tr>
</tbody>
</table>

2.2 Ærø Danish: Optional OS and Tonal Accents

Unlike Standard Danish, certain South Danish dialects allow the unshifted order parallel to the Swedish example (6b). Basbøll (1986) and Pedersen (1993) view OS as resulting from the rule
that applies to “light” constituents (letledsreglen), whereas the unshifted version follows the likeness rule (lighedsreglen), in that the word order matches that of full DP objects, as in (6c). Optional OS of weak pronouns is attested in the dialects spoken on Ærø (a small island with fewer than 6,000 inhabitants located to the east of Fyn). Examples of the unshifted and shifted orders are given in (9).

(9) Ærø Danish
   a. Anders køber aldrig=dm.
      ‘Anders never buys them.’
   b. Anders køber=dm aldrig.
      Anders buys them never

Whereas (9b) is acceptable in both Standard Danish and Ærø Danish, (9a) is acceptable only in the Ærø dialect and the other South Danish dialects that have two distinct tonal accents. Such tonal distinctions have been described by a number of Danish dialect researchers (e.g., Ejskjær 1993, 2005, Køster 1980, and Kroman 1947). These dialects occur south of the so-called stød line (isogloss), below which the characteristic Danish glottal stop is not found.³

South Danish tone accent dialects vary greatly in the way the tones are instantiated. Even on Ærø, at least three different varieties are spoken. According to Kroman (1947:71–72), the Marstal dialect of Ærø exhibits these properties: Accent 1 rises until the stressed syllable and then descends, whereas Accent 2 has an initial descending tone followed by a rise at the end of the word. The descending tone is more pronounced in Accent 1 and the rising tone is more pronounced in Accent 2.

The general distributional properties of tonal accent in Ærø Danish are similar to those of Standard Swedish. However, Ærø Danish monosyllables can also show an accent difference. For instance, according to the literature, the singular and the plural of sten ‘stone’ have a tone accent difference; the singular is pronounced with Accent 1 and the plural with Accent 2. Our fieldwork, which involved several visits to record speakers on Ærø as well as recording Ærø speakers elsewhere, confirms these patterns. Consider the PRAAT diagrams in figures 1 and 2, which show recordings of Ærø Accents 1 and 2 for the singular and plural of ‘stone’, respectively. As the figures indicate, Accent 1 has a high tone plus a late fall (HL) in the accent syllable, and Accent 2 an initial descending pitch movement followed by a rise (LH), as described by Kroman (1947). Since our fieldwork focused on OS rather than on examining the word prosody system in its entirety, we restrict ourselves to “descriptive” tonal representations of the melodies in words with tonal accent, rather than proposing a more detailed decomposition; this is sufficient for our purposes.

Although the connection between the existence of tone and the optionality of OS can be clearly observed in Danish dialects, to our knowledge it has not previously been explored. (Pedersen (1993) considers correlations between the availability of optional OS and various morphological and phonological properties, but does not consider the tonal correlation.) In section 3, we

³https://dialekt.ku.dk/dialektkort/. On card 3 (“Kort 3”), dark blue indicates the area in question.
will show that this correlation is not coincidental, but has meaningful implications for the understanding of optional and obligatory OS.

### 3 Tone Accent Units

In section 2, we demonstrated that areas with optional OS also have a tone accent distinction. Here, we investigate the nature of this correlation. Given that we suggest a phonological solution, a crucial piece of the puzzle is to understand how the presence of tonal accent can influence prosodic phrasing. Essentially, we argue that the presence of tonal accent can influence the mapping between phonological and syntactic domains in a way that makes it different from the mapping in varieties without tonal accent. More specifically, we propose that in varieties where...
OS is obligatory, weak pronouns cannot be pronounced in situ because adverbs are not proper hosts for weak pronouns (see Åfarli 1997, Holmberg and Platzack 1995, Josefsson 1992); in varieties with tonal accent, on the other hand, the in-situ pronunciation is possible because tonal accent creates a TAU that licenses incorporation. As we will show, this unit is characterized by the assignment of a single tonal accent.

In this section, we try to be as theory-neutral as possible with regard to terminology and more specific claims about the interface of phonology and syntax (though making some basic assumptions is unavoidable). A more detailed discussion of the phonology-syntax interface can be found in section 4, where we offer a formal analysis of optional and obligatory OS.

3.1 Mismatches between Prosody and Syntax

In phonological theory, it is by now widely accepted (though not uncontested4) that suprasegmental structure—that is, sound structure above the segmental level—is organized in a prosodic hierarchy. It is also commonly assumed that higher-level phonological domains interact with syntactic categories. There are good reasons to assume that the relationship between syntactic and phonological categories need not be one-to-one. Two fairly straightforward examples of mismatches between syntactic and phonological structure can be found in compounding and cliticization, respectively. Compounds, which function as one terminal element in the syntax, consist of more than one prosodic word. A different type of mismatch is found in cliticization, where certain syntactic elements, such as (weak) pronouns, are prosodically incorporated into a host word. The syntax-phonology mismatch observed in cliticization is particularly relevant for our purposes. As we demonstrate in section 3.2 for Swedish and section 3.3 for Ærø Danish, OS is a phenomenon where, in varieties with optional in-situ pronunciation of pronouns, adverbs seem to be suitable prosodic hosts for weak pronouns. This correlation will be further discussed in section 3.4.

3.2 Weak Pronoun Clitics and Tonal Accent in Swedish

As in many languages, there is no one-to-one correspondence between prosodic words and morphosyntactic words in Swedish. Relevant to our proposal is Riad’s (2013:131) observation that this applies to weak object pronouns, which may prosodically incorporate into a verb, forming one prosodic word. Riad exemplifies this with the verb ‘gav ‘gave’, followed by the object pronoun henne ‘her’ (pronounced ’[hænə] in isolation). The sequence *gav henne is pronounced as one prosodic word, ’[gævənə] ‘gave her’ with stress on the verb *gav ‘gave’ and [ənə] ‘her’ unstressed. Riad points out that the possibility of omitting the initial /h/ in *gava.hne is evidence that the first syllable of *gavenne ‘her’ in these cases is neither stressed, nor initial in a prosodic word.5 Furthermore, the syllabification is ga.ve.ne (rather than *gav.e.ne), which indicates a single syllabification domain (i.e., a single prosodic word).

4 See, for example, Scheer’s (2008) arguments against hierarchies in phonology, or Samuels’s (2009) arguments against syllable structure.

5 According to Riad (2013:66), the distribution of the phoneme /h/ “is largely limited to the initial position of prosodic words and of prosodic feet (i.e. stressed syllables).”
Riad’s discussion is restricted to verb + weak object pronouns. However, if we include weak subject pronouns, we can conclude that the formation of prosodic words does not depend on syntactic constituency. The sequence jag åt ‘I ate’ [jaːˈoːt] in Jag åt hönan ‘I ate the chicken’ forms one prosodic word, distinct from the object hönan ‘the chicken’ [ˈhœːnan], which is a prosodic word by itself: [jaːˈoːtˈhœːnan]; it is possible to have a break before hönan. Furthermore, it would be incorrect to leave the [h] sound out in this example, *[ˈhœːnan], a strong indication that the object hönan is a prosodic word on its own in this case. Assuming that verb + object form a syntactic constituent, the subject + verb example shows that a prosodic word can consist of units that are not syntactic constituents. Importantly, the unit of a host plus a weak pronoun clitic can carry one stress (unless the verb is a compound), and it has one tonal accent. In the case of a verb + a weak object pronoun, the tonal accent of the verb determines the tonal accent of the whole domain.

(10) a. gav ‘gave’ + henne ‘her’: \([1^{1}\text{gav}]_{o} + [2^{2}\text{henne}]_{o} \rightarrow [1^{1}\text{gavːvœa}]_{o}\)
    b. gillar ‘likes’ + det ‘it’: \([2^{2}\text{gillar}]_{o} + [1^{1}\text{det}]_{o} \rightarrow [2^{2}\text{jtladɔ}]_{o}\)

In these examples, the object pronoun does not have a tonal accent of its own (as it would have, were it not weak), but is incorporated in the TAU that spans over the sequence consisting of the verb and the pronoun. Furthermore, there is no restriction of constituency when it comes to prosodic words. Thus, in Jag åt hönan ‘I ate the chicken’, discussed above, jag åt ‘I ate’ is an Accent 1 prosodic word, whereas hönan ‘the chicken’ is an Accent 2 prosodic word.

Swedish is a verb-second (V2) language, and when a nonsubject occupies sentence-initial position, the subject follows the finite verb. In such cases, weak object pronouns prosodically incorporate into the preceding noun, giving rise to prosodic words, defined by one tone accent; an Accent 1 noun + a weak pronoun gives rise to an Accent 1 prosodic word, and an Accent 2 noun + a weak pronoun gives rise to an Accent 2 prosodic word. The derivation of such cases is discussed in section 4.2.

Interestingly, the same tonal patterns are found for adverbs + weak pronouns, where OS has not applied; as pointed out above, this is an option in (most dialects of) Swedish. The PRAAT diagrams in figures 3 and 4 respectively show the pitch tracks of an adverb followed by an incorporated weak pronoun and of an adverb followed by a nonpronominal object (the name Helle), which has not incorporated. Figure 3 shows that the H*ŁH tonal melody of the Accent 2 adverb is realized on the span that includes both the adverb and the pronominal object (note that the speaker’s voice is creaky toward the end of the phrase, which leads to a less clear pitch track). Nonetheless, we can observe that the weak pronoun does not have its own tonal accent. In addition, the initial /h/ in henne ‘her’ is deleted; as mentioned above, this is evidence that the pronoun is not pronounced as an independent prosodic word but is incorporated into the preceding adverb. In contrast, the name Helle in figure 4 is pronounced with its own separate Accent 2, and /h/ is not deleted; this indicates that the adverb and the name form two independent units for the assignment of tonal accent.

The relation between tonal accent and OS will be discussed in more detail in section 3.4. The main points here are that OS is optional in (most dialects of) Swedish, that weak pronouns
must be prosodically incorporated, and that tonal accents may span over sequences of (syntactic) words. The accent of the first word determines the tone of the whole TAU.

In the next section, we examine the corresponding phenomena in the Danish dialect spoken on the island of Ærø.
3.3 Weak Pronoun Clitics and Tonal Accent in Ærø Danish

As in Swedish, in Ærø Danish the weak pronoun can be pronounced in situ, as shown in figures 5 and 6 for Accent 1 and Accent 2 adverbs, respectively. As described for Swedish, the TAU spans the adverb and the pronoun in both accent types. Figures 7 and 8 illustrate the shifted cases, in which the weak pronoun is prosodically incorporated into the verb. Here again, the verb and
the incorporated pronoun form one TAU. Weak object pronouns incorporate into the subject when the subject is inverted (i.e., when another element precedes the verb and in questions). This word order was presented in (3c) for Standard Danish. In the Ærø dialect, as in Swedish, the tonal accent of the subject noun determines the tonal accent of the unit formed with the incorporated weak pronoun. This is in line with Kroman’s (1947) observation that when a weak unstressed
word is preceded by a stressed word, it has the same tone as the preceding word independently of its inherent tone (exactly as in Swedish). The correlation between languages in which tonal distinctions are to be found and languages in which OS is optional remains firm and is theoretically and typologically significant in and of itself. In the next section, we explain why this correlation is found.

3.4 Toward an Explanation of the Correlation between Tonal Distinctions and OS

As we have demonstrated, varieties with optional OS allow weak pronouns to incorporate into a preceding adverb whereas varieties with obligatory OS do not. Furthermore, we have demonstrated that varieties with optional OS also have a tone accent distinction. This correlation leads us to explore the possibility that phonological considerations are crucial in explaining variation in OS—specifically, that the presence of tonal accent makes adverbs suitable prosodic hosts for weak pronouns.

It is well-established that weak pronouns are too weak to surface independently and that they therefore require a prosodic host. In varieties with obligatory OS, we argue that adverbs have, broadly speaking, some boundary that blocks incorporation. This boundary appears to be less strong in varieties with tonal accent, however, meaning that the adverb and the weak pronoun can form a phonological unit; as a result, in-situ pronunciation of weak pronouns is possible. This general idea fits nicely with most current approaches to the syntax-phonology interface, where it is assumed that syntactic and phonological phrasing do not necessarily have to mirror each other. A relevant example is pronoun placement in Irish (Bennett, Elfner, and McCloskey 2016). As the authors argue (in our view convincingly), prosodic considerations can optionally override syntactic phrasing, which in turn can influence the position of a pronoun in an utterance.

If phonological phrasing and syntactic phrasing do not necessarily display a one-to-one correspondence, then the position of certain terminal nodes, such as adverbs and weak pronouns in OS, may be (at least partially) determined by phonological rather than by syntactic considerations. With regard to OS, we argue that the unifying character of tonal accent (as already identified in Haugen 1967; see section 1) is what permits the in-situ pronunciation in certain varieties with tonal accent. This unifying character, we believe, stems from the fact that, by its very nature, tonal accent is both a word-level and a phrase-level phenomenon.

By virtue of grouping words into two distinct lexical classes (Accent 1 and Accent 2), tonal accent is certainly a part of the word-level phonology. At the same time, however, it is intimately connected to the phrasal level, since the realization of tonal accents combines word-level and phrase-level tones. As first proposed in Bruce 1977, word-level tones mark the lexical distinction between Accent 1 and Accent 2, while phrase-level tones (focus tones, boundary tones) mark phrasal prominence and phrase edges. Since these tones are combined into a single tonal contour,
different types of tones—word-level tones and phrasal tones—together form a tonal/intonational unit, which we have descriptively referred to as a tone accent unit (TAU).

TAUs link word-level and phrase-level phonology in two ways. Most importantly, by virtue of combining word-level and phrase-level tones, they create a direct link between these two levels of structure. The combined word- and phrase-level relevance of tonal accent makes the phenomenon particularly salient and different from the purely postlexical use of tone in intonational languages like English.6

A second relevant characteristic of tonal accent is that tonal accents are often not only realized on the two types of (stressed) syllables that mark the difference between Accent 1 and Accent 2, but also can occur before or after the respective tone accent syllable (the precise realization depends on various prosodic factors, such as the position of word stress in an item or the position of an item in an intonational phrase; see, e.g., Bruce 1977). As Kristoffersen (2000:240) observes for Standard Norwegian, “[M]ore than one syntactic constituent, that is, any word not carrying primary stress that intervenes between two syllables with primary stress [= with a tonal accent], will be included in the domain of the full melodies.” Admittedly, not all varieties have such a wide range of melodic spans for the two accents; furthermore, as Tomas Riad (pers. comm.) points out, Accent 1 has a narrower range than Accent 2 in certain tone accent varieties (particularly in South Swedish). Still, the realization of tonal accent typically extends beyond the syllable marked for tonal accent. In that sense, such spans provide additional support for the connection between word-level and phrase-level prosody provided by the realization of tonal accent.

Crucially, in many languages higher-level phonological domains can most reliably be identified on the basis of the presence of phrase-marking tones. Such domains have sometimes been called accentual phrases, highlighting the importance of pitch accents for the structuring of utterances. This importance is particularly clear in certain languages with privative tonal contrasts (such as tonal accent in Mainland Scandinavian), sometimes also called pitch-accent languages (whether or not this is a useful term has been extensively discussed in prosodic typology (e.g., Hyman 2009, Van der Hulst 2011); we sidestep this issue here but note that we use the term pitch accent in a purely descriptive sense). For instance, in Lekeitio Basque, unaccented words (i.e., words without a lexical pitch accent) are typically phrased together with the following word; on the other hand, accented words (words with a lexical pitch accent) are always followed by a phrase boundary (Elordieta 1997). This indicates that the presence of precisely one pitch accent corresponds to precisely one phrasal unit. Similarly, it is well-established that in Japanese, lexical

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6 This in turn might be a reason why OS is obligatory in Standard Danish, although Danish has stød. Stød is a glottal closure on certain sonorant segments, whose distribution shares similarities with Accent 1 in tone accent varieties. How stød should be analyzed phonologically is a matter of debate, one possibility being a tonal analysis (see, e.g., Gussenhoven 2004 for discussion). However, on the basis of experimental evidence it has been argued that stød does not carry any identifiable tonal characteristics (Grønnum, Vázquez-Larruscain, and Basbøll 2013). This suggests that the main correlate of stød is indeed the glottal closure, which would imply that stød is a local phenomenon that does not directly interact with phrase-level intonation, unlike tonal accent.
pitch accents strongly influence phrase structure. Specifically, there is a constituent often called the accentual phrase or minor phrase that is identified by the presence of precisely one lexical pitch accent (e.g., Selkirk and Tateishi 1988). In the words of Ito and Mester (2013:26), “One defining property of the Minor Phrase not shared with the Major Phrase is accent culminativity: A Minor Phrase can have at most one H*L accent (hence the alternative descriptive name ‘Accentual Phrase’).” Such examples show particularly clearly that lexical accent properties can have a strong influence on prosodic phrasing; this is remarkably similar to what has been observed for Mainland Scandinavian varieties with tonal accent, and to what we claim facilitates optionality in OS.

In tone accent varieties, prosodic domains often range from one item with tonal accent to the next; if there is no following item with tonal accent, the domain extends to the end of the intonational phrase. These accent-based units, which have been called by different names (accent phrase (Abrahamsen 2003, Kristoffersen 2000, Morén-Duolljá 2013, Myrberg 2010), maximal prosodic word (Myrberg and Riad 2015), tonal foot/accsent unit (e.g., Fretheim and Nilsen 1989), or prosodic word (Bruce 1998, Hansson 2003)), correspond to what we have descriptively called tone accent units.

Aside from terminological differences, these proposals all capture the same insight: in Scandinavian tone accent varieties, as in Basque and Japanese, a higher-level prosodic unit is defined by the presence of one tonal accent. Crucially, the formation of these units is based entirely on prosodic grounds. This in turn demonstrates that tonal accent can interfere with the phonology-syntax mapping, since these units do not always map to syntactic constituents. All of these observations are perfectly in line with our claim that the phonological properties of tonal accent can create higher-level phonological domains; since a weak pronoun can form a unit together with a preceding tone accent item, and since adverbs carry tonal accent, they can thus license the in-situ pronunciation of weak pronouns. These observations are further developed in section 4, where we present our account of obligatory and optional OS.

4 A Prosodic Account of Obligatory and Optional OS

In section 4.1, we address why adverbs appear to be dispreferred hosts for clitics, couching the discussion in an overarching framework where adverbs originate on a separate plane and are linearized during Spell-Out. In section 4.2, we discuss how the influence of tonal accent on optionality of OS is encoded in the grammar. In doing so, we elaborate on the insight that the realization of tonal accent combines word-level and phrase-level tones. Essentially, we argue that word-level prominence tones distinguishing Accent 1 and 2 are indeed assigned in the word-level phonology; crucially and as expected, these tones are also assigned to adverbs. It is the presence of these word-level tones that allows adverbs to (optionally) host weak-pronoun clitics in the phrase-level phonology.

4.1 OS and the Special Status of Adverbs

4.1.1 General Considerations Since OS constructions in Mainland Scandinavian involve the order between an adverb and a weak pronoun, two possible analyses at the interface of syntax
and phonology present themselves. One possibility is that the weak pronoun shifts in order to satisfy the prosodic requirement of incorporation. Bennett, Elfner, and McCloskey (2016), for example, propose prosodic movement of a weak pronoun in Irish as a prosodic repair to remove it from a “strong” position in which a weak pronoun may not occur. Another possibility, which we will pursue here, is to constrain the position of the adverb. The position of adverbs is generally known to be flexible. In his review of Jacobson 1964, Keyser (1968) proposes that the various positions of adverbs correspond to the major syntactic breaks in the structure. He introduces a Transportability Convention that permits a particular constituent to occupy any position in a structure “so long as the sister relationships with all other nodes in the tree are maintained” (p. 368). We pursue a way of implementing a version of the Transportability Convention, one that applies to prosodic structure.7 The tools for such an approach are available in current theory: Chomsky (2001a, 2004) proposes that in addition to regular Merge “there is also an asymmetric operation of adjunction, which takes two objects β and α and forms the ordered pair (α, β), α adjoined to β . . . . Given the basic properties of adjunction, we might intuitively think of α as attached to β on a separate plane, with β retaining all its properties on the ‘primary plane,’ the simple structure” (Chomsky 2004:117–118). (α, β) is then converted to {α, β} (i.e., α is linearized to the plane of β) at Spell-Out to the phonology.

We adopt the idea that adverbs are asymmetrically adjoined on a separate plane (3D-adjoined in our terms) and are then linearized to the primary plane as Chomsky proposed. As far as we can see, our analysis could be formalized in different approaches to the syntax-phonology interface, such as Align/Wrap Theory (Truckenbrodt 1999), Match Theory (Selkirk 2009, 2011), or Command Theory (Kalivoda 2018). All of these approaches translate syntactic constituency at the level of the (morpho)syntactic word, phrase, and clause into corresponding prosodic (phonological) constituency at the prosodic word (ω), phonological phrase (φ), and intonational phrase (ι) levels in the input representation for the phonology. (We use Match Theory here for purposes of exposition.) If we linearize the 3D-adjoined adverbs as part of Spell-Out, the approach opens the possibility that phonological considerations can influence the linearization of adverbs. The restrictions observed for the linearization of adverbs follow from the structure of alignment constraints in OT:8

The idea that adjuncts are merged in a separate plane, a third dimension, is found already in Åfarli 1995, 1997 and developed further in Åfarli 2010 specifically to account for OS. Åfarli proposes that a process of “bending” linearizes the adverbs within the syntactic constituent to

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7 There is little agreement on how to account for the prosodic properties of adjuncts and the prosodic boundaries they incur. Bellik and Kalivoda (2016), Cheng and Downing (2016), Selkirk (2011), and Truckenbrodt (1999) propose a variety of approaches to account for these phenomena in a variety of languages. These approaches vary in their premises and the data they account for and are therefore difficult to compare.

8 A possibly compatible approach is found in Hellan 2005, 2012, where it is argued that the positioning of adverbs accounts for OS in Norwegian together with their prosodic effects, which are reflected in the assignment of tonal accent; yet the papers do not address optional OS, the empirical phenomenon at the core of our analysis.
which they are 3D-adjoined. According to Åfarli, adverbs are not “visible” at the point where weak pronouns incorporate; weak pronouns incorporate into adjacent hosts to their left on the same plane and therefore never appear to the right of an adverb. This explains the OS data in language varieties with obligatory OS, such as Danish (and some varieties of Norwegian), but it rules out the Swedish and Ærø data, which allow weak pronouns to be incorporated into adverbs. To remedy these shortcomings, we pursue an account of OS in which adverbs are 3D-adjoined as in Åfarli’s work, but are linearized at Spell-Out. 9

We repeat the basic OS data from section 1 here. (11a) shows the nonshifted order with a nonpronominal object. In the shifted order shown in (11b) and (11c), the pronoun is incorporated into a verbal and a nominal host, respectively. (11d) shows the nonshifted order with an auxiliary. (11e) is ruled out in Standard Danish because adverbs do not provide legitimate hosts for incorporation. (12) illustrates weak pronoun incorporation into the adverb in Swedish. The same is true of Ærø Danish, as demonstrated in section 3.3.

(11) Standard Danish
a. Peter mødte ikke Mette.
   Peter met not Mette
   ‘Peter didn’t meet Mette.’
b. Peter mødte=ham ikke.
   Peter met=him not
   ‘Peter didn’t meet him.’
c. Her mødte Peter=ham ikke.
   here met Peter=him not
   ‘Here Peter didn’t meet him.’
d. Peter har ikke mødt=ham.
   Peter has not met=him

e. *Peter mødte ikke=ham.
   Peter met not=him

(12) Swedish
Peter mötte inte=honon.
Peter met not=him
‘Peter didn’t meet him.’

9 It is well-known that different factors determine the placement of adverbs. Among these are the type of modification; the function, interpretation, and scope of the adverb; the information structure of the sentence; the concomitant phonological prominence of the various constituents; and the weight of each adverb. Åfarli (1995, 1997, 2010) argues that scope, for example, can be read off the 2D syntactic structure. This option is not available to us if the linearization is postsyntactic. Instead, we assume that scope follows from the syntactic node to which the adverb is attached. Yet scope interacts strongly with Information Structure, which in turn has prosodic effects. Independently of the issues discussed in this article, a model of the interfaces must be developed that takes these interactions into account.
The syntactic structure of (11a) is shown in (13a). Following assumptions similar to those in Bennett, Elfner, and McCloskey 2016, V* is a fusion of the syntactic features of the elements it raises through. The subject raises from Spec,vP to Spec,CP. In this way, V2 order is derived. The line connecting the adverb to vP is intended to represent it on a separate plane or in a third dimension. (13b) shows the same tree with all null elements removed.

Assuming that the prosodic phrase is the only intermediate unit between the word level and the intonational phrase (see section 4.2 for further discussion), (14) is the matched prosodic structure in which, following Elfner (2012), phrasal projections are ignored if they are empty of phonological material or if they dominate the same elements as a lower phrase. We assume that this faithful mapping is not a possible phonological surface representation since the adverb will have to be linearized.
4.1.2 Linear Alignment of Adverbs with Nonpronominal Objects

The default linear alignment of adverbs is to the left, rendering (11a) with the nonpronominal object. Formally, we express the general preference for left-alignment of adverbs interacting with OS in terms of the alignment constraint in (15); it captures Åfarli’s (2010) “left-bending” proposal and is conceptually comparable to traditional OT constraints that have been used to account for phonologically conditioned affix placement (Prince and Smolensky 2004). As a shorthand notation, we refer to adverbs interacting with OS as OS-adverbs (OS-Adv).

\[
\text{(15) LEFTMOST (OS-Adv, i)}
\]

Assign one violation mark for every \( \omega \) in the phonological representation that intervenes between the left edge of an intonational phrase and a \( \omega \) that corresponds to an OS-adverb in the syntactic representation.

LEFTMOST is fully satisfied by aligning the adverb all the way to the left of an intonational phrase, but this is of course not what the data show. That is, our approach must formally express that the OS-adverbs do not align to the left of the CP. Generally, preserving the word order determined by the syntax is enforced by the constraint NoShift (Bennett, Elfner, and McCloskey 2016).

\[
\text{(16) NoShift}
\]

Assign one violation mark for every terminal element that is linearly ordered before another terminal element in the syntactic representation, but that is ordered after that terminal element in the phonological representation.

10 Although most adverbs linearize to the left, some VP adverbs follow the object.

(i) Danish

De reparerede alle bilerne ofte/grundigt.
they repaired all cars.the often/thoroughly
‘They repaired all the cars often/thoroughly.’

Whereas grundigt ‘thoroughly’ can only be linearized to the right of the object, the linear position of ofte ‘often’ is flexible; it can be linearized before the object, rendering different scopal interpretations. (See Ernst 2002, where adverbs are licensed in any position where their scopal (and other) requirements are satisfied.)

(ii) Danish

De reparerede ofte alle bilerne.
they repaired often all cars.the
‘They often repaired all the cars.’

As expected, the scope of the adverb depends not only on the position of the adverb but also on the stress assigned to it and/or to the other constituents in the sentence. This demonstrates the need for the mediation of Information Structure as part of Spell-Out. Since linearization of an adverb to the right is determined in part lexically and since right-linearized adverbs do not interact with OS, we posit for the purposes of this article that adverbs preferably linearize to the left.

11 Adverbs—including some, but not all, OS-adverbs—do occur sentence-initially.

(i) Swedish

Troligen mötte Peter inte Anna.
probably met Peter not Anna
‘Probably Peter didn’t meet Anna.’

These have been accounted for as resulting from syntactic Â-movement, not an option if adverbs are merged in a third dimension and not linearized in the syntax. Erteschik-Shir (2007:113–119) argues, contra Frey 2006, that “fronted” adverbs have information-structural impact. The position of adverbs is therefore determined at the interface with Information Structure as well as Phonology, as part of externalization to the sensorimotor systems linearizing the output of narrow syntax (Berwick and Chomsky 2011). We assume that these adverbs are attached higher in the structure and therefore do not interact with OS.
Following Åfarli (2010:15), we assume that the adverb is not ordered with regard to the node it is attached to, and also not ordered with regard to the nodes it dominates. However, elements in higher nodes precede the adverb in the syntactic representation. As we explicate below, NoSHIFT ensures that the vP-adjoined adverb cannot be linearized to the left of the verb, since elements in the CP and TP precede elements in the vP in the syntactic representation. However, there is no order between the adverb and the object (full DP or pronoun), as these are on different planes; due to the influence of LEFTMOST, the adverb will then be placed as far to the left as possible.

To account for the placement of adverbs in cases where the object is a full DP, we postulate a ranking NoSHIFT \(\gg\) LEFTMOST, which derives the correct position of the adverb in the canonical case—that is, when the object is a full DP (or a CP). This is shown in (17).

(17) Word order in sentences with adverbs where the object is a full DP

<table>
<thead>
<tr>
<th>Syntactic structure(^{12})</th>
<th>NoSHIFT</th>
<th>LEFTMOST</th>
</tr>
</thead>
<tbody>
<tr>
<td>([\text{CP} \text{Peter} [\text{mødte} [\text{TP} [\text{vP} [\text{Adv ikke} [\text{V Mette}]]]]]])</td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>((\text{Peter} (\text{mødte} (\text{ikke} (\text{Mette})))))</td>
<td>***!</td>
<td></td>
</tr>
<tr>
<td>((\text{ikke} (\text{Peter} (\text{mødte} (\text{Mette})))))</td>
<td></td>
<td></td>
</tr>
<tr>
<td>((\text{Peter} (\text{mødte} (\text{Mette} (\text{ikke})))))</td>
<td>***!</td>
<td></td>
</tr>
</tbody>
</table>

Candidate (17a) is the winner because it aligns the adverb as far as possible to the left without changing the word order provided by the syntax. Candidate (17b) does align the adverb all the way to the left of the utterance, but crucially violates NoSHIFT. Finally, candidate (17c) puts the adverb in sentence-final position, which incurs more violations of LEFTMOST than necessary. Therefore, on the basis of the constraints used so far, (17c) is harmonically bounded and loses. However, the word order in (17c) is the default word order in expressions with a weak pronoun object; accordingly, this needs to be derived with additional constraints that regulate the interaction of weak pronouns and adverbs. To address this issue, we now proceed to examine the prosodic structure when the object is indeed a weak pronoun.

4.1.3 Linear Alignment of Adverbs with Weak Pronouns

A central property of phonological phrases is that they need to contain at least one prosodic word. Since a weak pronoun does not project its own prosodic word (it is “only” a syllable), it cannot project a phonological phrase on its own. We express this with the constraint in (18). This restriction may well be universal and thus not a violable constraint. We will omit it in the tableaux; if it were included, it would be undominated.

(18) \(\varphi \rightarrow \omega\) (possibly a universal)

Assign one violation mark for every phonological phrase that does not contain a prosodic word.

\(^{12}\) The angle brackets around the adverb signify that it is attached in a third dimension.
Since a weak pronoun cannot form its own phonological phrase, it must incorporate into a legitimate host. In-situ incorporation would lead to an adverb plus a weak pronoun clitic, as shown in (19a); this tree corresponds to (20), which, as discussed in section 3.4, is only permitted in varieties with tonal accent. Incorporation into, say, a verbal host is the default option; this is, of course, what is commonly referred to as OS, as shown in (19b) (corresponding to (11b)).

(19) a. b. 

There are good reasons to postulate that adverbs, and adjuncts in general, are prosodically different from other parts of speech. Broadly speaking, this can for instance be observed in the tendency for phrasal stress to skip adjuncts but not complements in certain types of phrases with broad focus (e.g., Gussenhoven 1983, Selkirk 1984, Truckenbrodt 1999). For instance, in German the strongest stress in the sentence Er soll Linguistik unterrichten ‘He is said to teach linguistics’ is on the complement, while it is on the verb (and thus not on the adjunct) in the corresponding Er soll in Ghana unterrichten ‘He is said to teach in Ghana’ (Truckenbrodt 2007:446). Similarly, we add, default nuclear stress in German is on the verb in the sentence Er soll nicht unterrichten ‘He is said not to teach’, with the adverb ‘not’. Comparable distinctions appear to exist in varieties of Danish and Swedish, but to the best of our knowledge there is a lack of detailed literature on the topic for these languages (cf. the remarks in Myrberg 2010:46); therefore, we will not pursue this specific issue in further detail here.

Crucially, however, such generalizations regarding the deviant prosody of adjuncts and adverbs are perfectly in line with observations on the special status of adverbs regarding OS. That is, it has repeatedly been recognized in the literature on OS that adverbs are less suitable hosts for clitics than verbs, nouns, prepositions, and so on (e.g., Åfarli 1997, Holmberg and Platzack 1995, Josefsson 1992). This property of the system, which is at the very core of understanding OS, must be accounted for. The status of adverbs as dispreferred hosts is, arguably, not determined on the basis of phonological considerations alone, as the phonological properties of adverbs (e.g., stress, segmental structure) do not systematically differ from those of other content words. Along these lines, simply restating that adverbs are “bad” hosts for incorporation would appear to be stipulative. We believe that a more promising solution is to exploit the syntactic status of AdvPs: if they are indeed 3D-adjoined, it follows that they are on a different plane from VPs and NPs. Still, adverbs must somehow be integrated into the linear string, and we argue that this happens at the mapping to prosodic structure.
Moving toward an explanation of OS, we argue that pronouns are preferably incorporated into a host from the same syntactic dimension; this is why adverbs are dispreferred hosts, which in turn causes OS. That is, prosodic words should preferably contain only elements from the same syntactic dimension, not ones that originate in different syntactic dimensions. This is captured with the constraint in (20).

(20) *MULTIPLE
Assign one violation mark for every prosodic word that contains elements from different dimensions of the syntactic representation.

Equipped with these constraints, we have the tools to formally analyze obligatory and optional OS. We begin with obligatory OS in Danish; the relevant tableau is shown in (21).

(21) Object shift is obligatory in Standard Danish

<table>
<thead>
<tr>
<th>Candidate</th>
<th>NoSHIFT</th>
<th>*MULTIPLE</th>
<th>LEFTMOST</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. → ((ϕ Peter (ϕ mødte=ham (ϕ ikke))))</td>
<td>×</td>
<td></td>
<td>***</td>
</tr>
<tr>
<td>b. ((ϕ Peter (ϕ mødte (ϕ ikke=ham))))</td>
<td></td>
<td>*!</td>
<td>**</td>
</tr>
<tr>
<td>c. ((ϕ ikke (ϕ Peter (ϕ mødte=ham))))</td>
<td></td>
<td></td>
<td>**!</td>
</tr>
</tbody>
</table>

Candidate (21a) is the winner because it preserves the word order determined by the syntax (satisfying NoSHIFT) and does not cliticize the pronoun onto the adverb (satisfying *MULTIPLE). Since the adverb is not left-aligned in the highest phonological phrase, the winning candidate (21a) violates low-ranked LEFTMOST. Candidate (21b), which incorporates the weak pronoun into the adverb, fatally violates *MULTIPLE because adverb and pronoun originate in different dimensions. Candidate (21c), which aligns the adverb with the left edge of the verb, violates undominated NoSHIFT. (Of course, this specific candidate would also violate V2, but this is not crucial for our point.)

4.2 Optional OS in Varieties with Tonal Accent: A Constraint-Based Account

In this section, we account for the fact that OS is optional in certain varieties with tonal accent, such as Ærø Danish and Swedish. In section 3.4, we argued that this is because prosodic phrasing in such varieties is influenced by the presence of tonal accent. The salience and unifying character of tonal accent creates prosodic domains that span from one tone accent item to the next or, if no other tone accent item follows, to the end of an intonational phrase. The fact that adverbs have a tonal accent just like other types of content words makes it possible to integrate them into the core prosodic system, which in turn means that they can host weak pronouns, even if the tone accent adverbs originate in a different representational dimension.
We express this ability for adverbs to potentially host tones with the constraint LICENSE (MULTIPLE, TAU) (in tableaux, LICENSE), along the lines of Ito, Mester, and Padgett 1995. Again, we use the term TAU as a descriptive notion and remain agnostic regarding how to best incorporate this notion into the phonological grammar.

(22) LICENSE (MULTIPLE, TAU)

Assign one violation mark for every prosodic word that contains elements from different dimensions of the syntactic representation and that is not licensed by a TAU.

To express how the grammar identifies TAUs, we postulate that the relevant generalizations are best expressed in a stratal approach to OT (e.g., Kiparsky 2015, Bermúdez-Otero 2018 for overview); Stratal OT typically assumes OT evaluations at three levels (stem, word, phrase), of which the latter two are relevant here. Since Bruce’s (1977) first autosegmental analysis of Swedish tonal accent, it has been widely established that both Accent 1 and Accent 2 have word-level prominence tones, which then combine with phrasal intonational tones to create the tonal contours. For our purposes, it does not matter whether these tones are stored in the lexicon or inserted during word-level computation (in a stratal approach); it is crucial, however, that these tones are part of the input to the phrase-level grammar. The presence of these lexical accents—in the sense that they are lexically distinctive—is what the grammar takes as an indication that the item in question can create a TAU; this is, arguably, very similar to what is found in other accentual languages, as discussed in section 3.4 for Lekeitio Basque and Japanese.

Regarding the technical aspects of our OT analysis, we focus here on the phrase-level grammar where adverbs are linearized, since that is the core of this article. To allow adverbs to potentially host clitics in varieties with tonal accent, two aspects of the grammar must be modified. First, LICENSE (MULTIPLE, TAU) must be introduced, and it needs to outrank *MULTIPLE (since Danish has no tonal accent, no word-level tones will be present in the grammar, so LICENSE (MULTIPLE, TAU) would have no effect). Second, *MULTIPLE, which militates against phonological words with elements from multiple dimensions, must become violable. Crucially, however, it must still play an active role in the grammar, since OS is still possible in Ærø Danish and Swedish. To incorporate the possibility of shift, we argue that in Ærø Danish and Swedish, *MULTIPLE and LEFTMOST are unranked, which means that candidates (23a) and (23b) are both legitimate output forms in the tableau in (23). The presence of word-level tones in the input is indicated with an accent mark on the adverb ’inte, which allows it to create a TAU; since only the tone on the adverb is relevant for understanding OS, accent marks for other lexical items are omitted. (23a) fares better with regard to *MULTIPLE, while (23b) incurs fewer violations of LEFTMOST. (23c) violates NO SHIFT. (23d) is included as a hypothetical candidate without a prominence tone on the adverb, indicated by the absence of an accent mark; this represents the situation in Standard Danish, where LICENSE (MULTIPLE, TAU) will always be violated (since the language does not have tonal accent).
Which of the two winning forms in (23) is chosen in the end may be decided in the grammar, where optionality could be modeled in many different ways (e.g., Boersma 1998, Coetzee 2016, Pater 2009). Alternatively, we could assume that both surface forms are generated and that the version that is eventually spelled out is chosen in a postgrammatical component—for instance, on the basis of extralinguistic considerations. We leave this question open; for present purposes, it is more important to show that both options are available.

As discussed throughout this article, it has often been observed that adverbs are dispreferred hosts for clitics crosslinguistically. Translating this observation into our account, we argue that in OT grammars, *MULTIPLE is high-ranked by default, which means that, all else being equal, adverbs will not be suitable hosts for clitics. Without any language-specific prosodic property that affects this ranking, adverbs will not be able to host weak pronouns. As we have argued, tonal accent is precisely such a property and therefore potentially renders *MULTIPLE a violable constraint in languages with tonal accent, in combination with LICENSE (MULTIPLE, TAU); this is what we observe in Swedish and Ærø Danish.

This proposal is in line with standard assumptions in OT, where markedness constraints (such as *MULTIPLE) are assumed to be high-ranked by default and have to be demoted on the basis of language-specific evidence (see, e.g., Demuth 1995 for an application to the acquisition of prosody). Furthermore, it is widely accepted in the OT literature that changes in the grammar of a language do not come about by simply changing constraint hierarchies but instead are driven by properties of the language. Holt (2003:16) summarizes this view by stating that “the reranking of constraints does not drive historical change, but instead results from it.” Translating this to the case at hand, we can identify tonal accent as the driver of change, and the resulting grammar reflects the influence of tonal accent on prosodic phrasing.

It would be tempting to think that *MULTIPLE might be expendable in the analysis; after all, high-ranked LICENSE (MULTIPLE, TAU) would be sufficient to rule out the unshifted word order with weak pronouns in Standard Danish. The problem is that such an analysis would predict that in-situ pronunciations should be the default in varieties with tonal accent; however, OS is still possible in, for example, Swedish. To account for optionality, the analysis thus requires a general constraint of the type *MULTIPLE alongside LICENSE (MULTIPLE, TAU).13

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13 In fact, it would be possible to provide an analysis of the patterns without the constraint LICENSE (MULTIPLE, TAU); in that case, however, the connection between tonal accent and optional OS would not be reflected in the formal analysis, which is why we chose to include the constraint in our formalization.
Moving on with our formalization, the same principles discussed above apply when the subject remains in Spec,TP, as in yes/no questions, or when another element (e.g., an adverb or a fronted object) occupies clause-initial position. (24a) (repeated from (11c)) exemplifies a fronted adverb in Danish and (24b) the alternative possible word order in Swedish.

(24) a. **Standard Danish**  
    Her mødte Peter=ham ikke.  
    here met Peter=him not  
    ‘Here Peter didn’t meet him.’

b. **Swedish**  
    Här mötte Peter inte=honom.  
    here met Peter not=him

The structure in (25) is the winning candidate for (24a), comparable to (21a). The only difference is that the pronoun in this case is adjacent to the subject and therefore the incorporating host is a noun rather than a verb.

(25) ((φ her (φ mødte (φ Peter=ham (φ ikke))))

The Swedish example (24b) is parallel to (23b) and hence a legitimate candidate. (23a) is also legitimate, rendering the other possible order in Swedish equivalent to the Danish (24a).

The subject can itself be a weak pronoun, as in (26a), in which case it incorporates into the verb it is adjacent to. If both the subject and the object are pronouns, as in (26b), both are incorporated, forming a clitic cluster.

(26) **Danish**

a. Her mødte=han ikke Peter.  
    here met=he not Peter  
    ‘Here he didn’t meet Peter.’

b. Her mødte=han=ham ikke.  
    here met=he=him not  
    ‘Here he didn’t meet him.’

Now, how do we account for the necessary relation between OS and verb movement out of the VP (Holmberg’s Generalization)? Remember that, as shown in (27), OS does not occur in subordinate clauses or in main clauses in which an auxiliary or modal undergoes V2.

(27) **Danish**

a. at Peter ikke så=den *at Peter den ikke så  
    that Peter not saw=it  
    ‘that Peter didn’t see it’

    Peter has not seen=it  
    ‘Peter hasn’t seen it.’
In these cases, the verb remains inside the vP. Consequently, the winning candidate will be one in which the adverb precedes the prosodic phrase that includes the verb and the incorporated weak pronoun object, as shown in (28).

(28) \((\varphi \text{Peter} (\varphi \text{har} (\varphi \text{ikke} (\varphi \text{set} = \text{den}))))\)

As formulated in Holmberg 1999, Holmberg’s Generalization states that Scandinavian OS cannot cross any phonologically realized VP-internal material. This way of formulating the generalization holds for the classic cases in (11) and also covers additional cases in which “any phonological visible category inside VP preceding the object position will block Object Shift” (Holmberg 1999: 2). This is the case for verb particles in Swedish, which generally precede the weak object pronoun, as shown in (29). (Verb particles form a TAU with weak pronouns, on a par with verbs.)

(29) Swedish
   a. Han sparkade inte ut bollen/den.
      he kicked not out ball.the/it
      ‘He didn’t kick out the ball/it.’
   b. *Han sparkade den inte ut.
      he kicked it not out

Particles and prepositions, together with verbs and nouns, are perfectly good hosts for weak pronoun incorporation both in Swedish and in Danish. Since the weak pronoun follows a proper host, OS will not take place. The OT evaluation would be identical to the one in (17). In Danish, however, the particle must follow the object and OS is therefore obligatory.

(30) Danish
   a. Han sparkede ikke bolden/*den ud.
      he kicked not ball.the/*it out
      ‘He didn’t kick the ball out.’
   b. Han sparkede den ikke ud.
      he kicked it not out
      ‘He didn’t kick it out.’

The version of (30a) with den is ruled out in Standard Danish because adverbs cannot host weak pronouns, and therefore OS is required as it is in the standard case.

Swedish has a small number of “Danish-style” verb particles—that is, verb particles that optionally may follow the object pronoun, such as med ‘with’.

(31) Swedish
   Hon tog (dem) inte (dem) med till kalaset.
   she took (them) not (them) with to party.the
   ‘She didn’t bring them to the party.’

14 In Swedish, for example, a verb particle + a weak object pronoun generally form an Accent 1 TAU.
As (31) shows, OS is an option in such cases. As before, Swedish allows incorporation of the weak pronoun into an adverbial host but also allows OS in this case, as predicted by the constraint ranking in (23). This provides further support for our analysis of OS as driven by phonological constraints.

Double object constructions are another phenomenon mentioned in this context by Holmberg (1999). In Danish and Swedish, the direct object does not shift across the indirect object in these cases. The only grammatical word order is shown (for Danish) in (32a); the ungrammatical, shifted order is shown in (32b). 15

(32) Danish
   a. Jeg viste ikke engang Peter bogen/den.
       I showed not even Peter book.the/it
       ‘I didn’t even show Peter the book/it.’
   b. *Jeg viste den ikke engang Peter.
       I showed it not even Peter

Our account is simple (whatever syntactic account is given to double object constructions): the weak pronoun is incorporated into the preceding noun, again a proper host for incorporation. 16

A complication is provided by the Swedish example in (33), which is ungrammatical in Danish, where the adverb must follow the verb.

(33) Swedish
    Jag gav Elsa inte boken/den.
    I gave Elsa not book.the/it
    ‘I didn’t give Elsa the book/it.’

Our account predicts that the weak pronoun can incorporate into the adverb in Swedish and not in Danish; however, we have no explanation for why the adverb can occur between the indirect and direct objects in Swedish but not in Danish, just as we have no explanation for the different word orders with particles in the two languages. These issues are clearly beyond the topic of this article.

In Swedish but not in Standard Danish, it has been claimed that weak pronouns can occur between OS adverbs when several occur in sequence, as illustrated in (34).

(34) Swedish
    a. I går läste han dem ju alltså troligen inte.
       yesterday read he them as you know thus probably not

15 In Vikner 1989:151, a sentence parallel to (32a) is marked ?. We have checked this word order with a number of speakers and have found it to be fine, although there is a preference for Jeg viste den ikke engang till Peter (I showed it not even to Peter) ‘I didn’t even show it to Peter’. This has to do with information structure, which determines the preferred order of objects in these constructions. Pronouns that are highly topical precede less topical elements. (For details, see Erteschik-Shir 1979.)

16 The structure of the double object construction has been discussed extensively in the literature. We follow Platzack (2011:100), among others, in assuming that the indirect object is located in a separate projection; in other words, it is not adjoined to the VP. Thanks to a reviewer for pointing out this unclarity in a previous version of the article.
b. I går läste han ju dem alltså troligen inte.
yesterday read he as.you.know them thus probably not

c. I går läste han ju alltså dem troligen inte.
yesterday read he as.you.know thus them probably not

d. I går läste han ju alltså troligen dem inte.
yesterday read he as.you.know thus probably them not

e. I går läste han ju alltså troligen inte dem.
yesterday read he as.you.know thus probably not them

‘Yesterday as you know he probably did not read them thus.’
(Hellan and Platzack 1995:56)

We have made an initial attempt to record such cases in Ærø Danish and have verified that although
adverbial intermingling is not possible in Standard Danish, this dialect aligns with Swedish in
allowing it. The data we have collected so far show that not all weak pronoun positions are
possible and some are better than others. It is clear that the variables involved are the length of
the adverbs and whether they are themselves clitics or stressed. These variables affect whether
the adverb-pronoun sequence can be pronounced as one TAU, as demonstrated by Josefsson
(2010:17).

(35) Swedish

Därför såg damen förmodligen honom inte.
therefore saw lady.the probably him not
‘Therefore the lady probably didn’t see him.’

She notes that “the whole sequence (för)modligen honom [för\`mu:dl\`igen\`om] is pronounced
with accent 1.”

Before we can examine how our analysis fares with adverbial intermingling, however, the
field will have to reach a better understanding of (a) how adverbs are 3D-aligned if there are
several of them and (b) what the exact structure of the relevant data is. Regarding adverb alignment,
it is commonly accepted that the order of adverbs is fixed in the syntax and must be preserved
when they are aligned.17 Suppose the adverbs are hierarchically ordered (Cinque 1999–style) so
that the adverb that is 3D-attached to a higher node will be aligned before the adverbs attached
below it.18 This would render a string such as (36).

(36) (\(\varphi\) Peter (\(\varphi\) mötte (\(\varphi\) förmodligen=honom) (\(\varphi\) inte))))

Without the final adverb förmodligen ‘probably’, the string is identical to the optimal (b) in tableau
(23). In order to preserve adverb order, inte must follow förmodligen. However, it cannot intervene
between the pronoun and its host and therefore linearizes to the right of both. It follows that we
predict adverbial intermingling only for tonal dialects in which adverbs can host pronouns, which

17 See Sells 2001:57 for the order of sentence adverbs in Swedish, and Hansen and Heltoft 2011:1038 for their order
in Danish. As far as we know, adverbs are not realigned for phonological reasons.
18 We of course differ from Cinque (1999) in introducing adverbs in a different dimension.
appears to be borne out. Still, many questions remain unanswered with respect to the 3D linearization of an ordered sequence of adverbs (in any language). The issue is further complicated by the fact that intermingling in Swedish is possible but appears to be dispreferred. That is, relevant constructions are rarely attested and possibly not fully grammatical (Sells (2001:63), for instance, marks all the examples with intermingling in (34) as questionable).

As such fundamental questions themselves are not well-understood, we do not feel comfortable attempting to answer them here and therefore cannot offer a proper formalization.

5 Seeming Counterexamples

In this section, we discuss two seeming counterexamples to our claim that optionality depends on the availability of tonal distinctions. Fenno-Swedish and Lolland-Falster Danish have been claimed to allow the in-situ option despite not having tonal distinctions. We will demonstrate that these two dialects do not provide counterexamples to our claim, but for different reasons. We also show that Oevdalian patterns just like Lolland-Falster Danish.

Our claims concerning Fenno-Swedish and Lolland-Falster Danish are based on data derived from recordings of three consultants in each case. Consultants were asked for grammaticality judgments with and without OS with a variety of different adverbs before the recordings were made. For reasons of space, we leave out the details of our results.

Fenno-Swedish lacks tone accent distinctions (Bruce 2010:180, Huhtamäki 2015, Malmberg 1971:127, Selenius 1972), yet weak object pronouns may remain in situ. Our explanation for this seeming exception to our claim is that Fenno-Swedish unstressed pronouns are not weak and therefore are not required to incorporate. Kiparsky (2008:202) provides a list of “function words with short stressed syllables in Helsinki Swedish,” among them pronouns such as homon ‘him’ and det ‘it’. Kuronen and Leinonen (2008) note that Fenno-Swedish differs from Standard Swedish when it comes to rhythm. According to their analysis, the degree of reduction of stress in non-stressed syllables is much lower than in Standard Swedish. We take these comments to indicate that Fenno-Swedish unstressed object pronouns are not prosodically weak, as they are in Standard Swedish. Our recordings verified our predictions: weak pronouns were pronounced fully and not incorporated when they were pronounced in situ. The recordings also showed that shifted pronouns in this dialect were consistently shorter across the board than those left in situ. Fenno-Swedish is therefore not a counterexample to our proposal.

Our analysis only predicts the correlation between tonal distinctions and the option of leaving the weak object pronoun in situ. We have made no claims about whether a language or dialect need avail itself of this option. In fact, they do not. Norwegian is a language with tonal distinctions, yet many Norwegian dialects have obligatory OS—as does Standard Danish, which does not have tonal distinctions. The Norwegian dialect Vesttrøndersk (= Nordmørsk) exemplifies a dialect in which OS is obligatory (despite the presence of tonal distinctions). In the dialect of Trøndersk spoken in most parts of Trøndelag (e.g., Trondheim), however, negation undergoes apocope (ikkje \→ iji), resulting in a monosyllabic clitic. In this dialect and with this adverb, pronouncing the pronoun in situ is strongly preferred. If we assume that the word order sàg iji’n ‘saw=not=it’ is
due to the clitic nature of the negative adverb, we have an explanation for the difference between these two dialects and the limitation of the in-situ option to the clitic pronoun.

Lolland-Falster Danish does not have tonal distinctions, but it has been claimed to allow weak pronouns to remain in situ. If so, this dialect would be a bona fide counterexample to our proposal.

(37) Lolland-Falster Danish

Pronounced [jæ ve’ jund dø]

jeg ved=jo=inte=det

I know=as.you.know=not=it

‘I, as you know, don’t know it.’

(Pedersen 1993:205)

However, like Trøndersk, the dialect has apocope; negation, ikke, which in standard Danish has two syllables, is pronounced ik or int in the Lolland-Falster dialect.19 The adverb jo is also a clitic. Pedersen’s example, as she herself describes the pronunciation, contains a clitic cluster of these two adverbs. We therefore hypothesized that the weak pronoun, which remains in situ in this dialect, is incorporated into this clitic cluster, which in (37) is hosted by the verb. Our hypothesis was confirmed by the data we collected from our consultants. In-situ pronouns were found only with the clitic adverbs, and the recordings clearly showed the incorporation of the clitic cluster composed of the clitic adverb(s) and the weak pronoun into the preceding verb. Lolland-Falster Danish thus has obligatory OS, as we predict for a dialect without tonal distinctions. The cases of in-situ weak pronouns are limited to clitic adverbs that cliticize onto the verbs themselves, forming a clitic cluster with the following weak pronouns.

We have made no claim about the availability of OS in cases where tonal distinctions enable the in-situ pronunciation of the weak pronoun. Öevdalian, which has been claimed to allow only the in-situ option, is therefore not a counterexample to our proposal.20 Although the claim is based on data in Levander 1909, it would be surprising if this variety were to differ from Standard Swedish in this manner. Levander’s data only relate to the order of clitic negation and an object in which negation and the object form a clitic cluster incorporated into the verb. Interestingly, it is the same misreading of the data found in Lolland-Falster Danish that is also the cause of much misleading discussion of Öevdalian: in Öevdalian, as in Lolland-Falster Danish, the in-situ word order is limited to clitic adverbs. As can be gathered from other sources (e.g., Åkerberg 2012), OS is indeed available in Öevdalian, with sentence adverbs other than weak negation.

19 Elisabet Engdahl (pers. comm.) suggests that ikke in Standard Danish also undergoes apocope and should behave similarly. It is true that it tends to be pronounced ik sentence-finally (in cases of OS). In any other position, it is pronounced either fully with voicing of the consonant or without the final schwa but retaining the voiced consonant, indicating the phonological presence of the schwa.

6 Conclusions

In this article, we have described the variation in the properties of OS in some Mainland Scandinavian languages and dialects. We have demonstrated that optionality of OS is attested only in dialects that have tonal distinctions. Whereas there is an abundance of research on the tonal distinctions of Swedish, the only detailed description of the tonal distinctions of the Danish dialect spoken on the island of Ærø, as far as we know, is that of Kroman (1947). To obtain current empirical evidence, we recorded speakers of this dialect, focusing on the tonal accents and their instantiation in cases of pronoun incorporation. And whereas the existence of both tonal accents and the optionality of OS in Swedish and in certain South Danish dialects, including the dialect spoken on Ærø, is well-known, the idea that the two are correlated has not been proposed before. In fact, it has been rejected by linguists citing the dialects discussed in section 5. We have argued that this correlation exists and offered an explanation for it.

The article also adds another case to the growing set of phenomena for which a purely phonological account can be argued, and provides a deeper understanding of what prosodically driven movement should look like and to what kinds of movement it applies. Whereas syntactic movement is triggered by syntactic features, OS is triggered by prosodic features. Furthermore, it is optional, dependent on dialectal variation. Optional movement rules have long been a problem for syntactic theory, and it would therefore be advantageous if optionality were relegated to phonology (as well as Information Structure).

It has often been suggested to us that our phonological account could be presented as phonological constraints on the output of syntactic movement (several such accounts are listed in section 1). One problem with approaches of this type is that there is no syntactic trigger for OS, and certainly not for Mainland Scandinavian OS, which is restricted to weak pronouns. Moreover, such an approach does not explain the optionality of OS in tonal dialects, as our approach does.

An important consequence of Minimalist architecture is that movement that has semantic import must occur in the syntax. Mainland Scandinavian OS, we claim, does not shed light on this issue, since our analysis is based on the requirement of weak pronouns to incorporate, not on their status as topics. Still, OS applies to full DPs in Icelandic, and it is commonly assumed that Icelandic OS applies to topics. Similarly, scrambling phenomena in a variety of languages also target topics. Since topics take wide scope, semantic import follows. Further research is required to study the interaction between the status of the various interface components, in particular the interaction between phonology and Information Structure as part of externalization to the sensorimotor systems linearizing the output of narrow syntax (Berwick and Chomsky 2011). Phenomena that might shed light on these interfaces are the tendency for pronouns referring to

21 Diesing and Jelinek (1993) consider the shifted element to be in the restriction and the nonshifted one to be in the nuclear scope, rendering the correct scopal interpretations.

22 “Though the matter is contested, it seems that there is by now substantial linguistic evidence that ordering is restricted to externalization of internal computation to the sensorimotor system, and plays no role in core syntax and semantics, a conclusion for which there is also accumulating biological evidence of a sort familiar to mainstream biologists” (Berwick and Chomsky 2011:29). See also footnote 9 concerning the interaction between phonology and Information Structure.

The view that OS involves prosodic features is not new (e.g., Erteschik-Shir 2005a,b, Hellan 1994, Hosono 2010, 2013, Josefsson 2012). Our main innovation is the claim that the phenomenon is purely phonological and that tonal accent plays an important role in explaining variation.

We expect that this article, together with other proposals that word order is determined purely by phonology (e.g., Bennett, Elfner, and McCloskey 2016), will trigger more investigations into phonologically determined word order of different kinds in a variety of languages.

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