Variation in Mainland Scandinavian Object Shift: A Prosodic Analysis

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1. Introduction

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

(1) a. Peter så den ikke. Standard Danish
Peter saw it not
'Peter didn't see it.'

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

(2) a. Peter såg den inte. Swedish
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. The examples in (2) show that in Swedish both word orders are possible.

Danish and Swedish 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 dialectical variations are connected: optional OS is enabled due to the presence of tonal

distinctions. The idea that tonal accent identifies prosodic units can be found already in Haugen 1967, 198. According to Haugen "tone 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 in spite of having a tone accent distinctions.

Elaborating on previous work by Erteschik-Shir and Josefsson, the goal of this paper is to propose a phonological analysis of optional and obligatory OS that at the same time accounts for this pattern of variation, thus providing further evidence for a phonological analysis of OS.

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

(3) a. Peter mødte ikke Anders. Standard Danish
Peter met not Anders.
'Peter didn't meet Anders.'

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 OS to structures that have undergone verb-movement. This is shown in (3) and (4):

(4) a. Peter har ikke mødt ham./*Peter har ham ikke mødt.

Peter has not met him / Peter has him not met

b. . . . at Peter ikke mødte ham./*…at Peter ham ikke mødte.

that Peter not met him/ … that Peter him not met

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

The phenomenon 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. In spite of the challenge, the problem has engendered innovative syntactic analyses since its inception by Holmberg. Prominent examples are: Åfarli 1995, 1997, 2010, Bobaljik 2002, Nilsen 2003, Fox and Pesetsky 2005, Vogel 2006, Christensen 2003 and Vikner 2012. Bobaljik, for example, proposes a copy theory of movement which 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, in this paper we present a purely phonological analysis of OS.

That Information Structure and interpretation impacts OS has also been recognized by Holmberg himself (Holmberg 1999) and further implemented in Chomsky 2001b. Information structure and interpretation also plays a role in many other accounts (e.g., Diesing and Jelinek 1995, Erteschik-Shir and Strahov 2004, the work of Josefsson 2010, 2012, Anderssen and Bentzen 2012 and Andréasson 2012). Most work on OS also takes into account the prosodic features of the phenomenon. Prominent among these are Hellan 1994, Erteschik-Shir 2005a, b, 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 account – closely based on Holmberg's – recognizes that OS has phonological properties, but 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. He 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 it, whereas others do not is left unaccounted for.

Following Josefsson 1992, 1994, 2010, 2012, Åfarli 1995, 1997, 2010, and Erteschik-Shir 2005, 2005b, we argue that OS in mainland Scandinavian follows from the requirement that phonologically weak pronouns must prosodically incorporate into a legitimate host.[2] This predicts OS, but not, as noted in these papers, the fact that OS is obligatory in Standard Danish but optional in Standard Swedish and certain

Danish dialects, which allow not only for OS as in (5a), but also the unshifted order in (5b) akin to the order with full DPs as in (5c).

(5) a. Peter såg den inte. (Swedish)
Peter saw it not
'Peter didn't see it.'

b. Peter såg inte den.
Peter saw not it

c. Peter såg inte Anders.
Peter saw not Anders.

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 (5b). 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. These tone accent varieties are compared to Standard Danish, which lacks tonal distinctions and in which OS is obligatory.

The paper is organized as follows: Section 2 offers Swedish and Ærø data showing the correlation between tonal accents and OS. Section 3 analyzes TAUs and provides an explanation of how these units enable prosodic incorporation. Section 4 offers 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 argue for an account in which OT constraints determine how the adverbs are phonologically linearized allowing for both variations as well as Holmberg's generalization. We employ OT constraints to formalize the patterns (Prince and Smolensky 2004); yet be believe that a derivational account would also be

possible. Furthermore, we make reference to Match Theory (MT) for purposes of exposition (Selkirk 2009, 2011), but we believe that these interactions could be expressed equally well in other approaches to the syntax-phonology interface, such as Truckenbrodt 1999 and Kalivoda 2018.

Section 5 examines Fenno-Swedish, spoken in Finland and Lolland-Falster Danish, spoken on two islands in southern Denmark, as well as Oevdalian, spoken in the north western part of Dalecarlia 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 Co-occurrence of Optional OS and Tonal Accent

This section provides data that illustrate the co-occurrence of optional OS and tonal accent. In 2.1 we present relevant data from Swedish. 2.1.1 discusses OS in Standard Swedish, one of the varieties where OS is optional. The presentation is based mainly on Josefsson 2003, 2010. 2.1.2 briefly reviews some basics of tonal accent in Swedish. 2.2 shows that the same generalizations hold for Ærø Danish, which is known to have tonal accent (described in detail in Kroman 1947). Our own fieldwork (2.2.1) confirms that the variety has optional OS, and 2.2.2 elaborates the properties of tonal accent in Ærø Danish.

2.1 Swedish: Optional OS and Tonal Accents

It has been claimed in the literature 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 this study, 26 native speakers of Swedish were asked to give

grammaticality judgements of a number of shifted and unshifted sentences. An example is given below.

(6) 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 (6a) is unshifted; the negation precedes the object pronoun, *inte honom* 'not him', whereas the reverse holds for (6b), *honom inte* 'him not'. The study showed that OS is optional both with mono- and dysyllabic pronouns. No difference between speakers of different ages or dialects was found.

Most Swedish and Norwegian dialects, as well as some Southern 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 [1]anden (duck.the) 'the duck' and [2]anden (spirit.the) 'the spirit'. The tonal accent contours differ between dialects, but a typical Stockholm variant is as shown below:

(7) Stockholm Swedish: (from Riad 2013, 184) word accent focus accent

anden 'the duck'	[1ˈandən]→	Accent 1	HL*	L*H
anden 'the ghost'	[2ˈandən]→	Accent 2	H*L	H*LH

2.2 Ærø Danish: Optional OS and Tonal Accents

Unlike standard Danish, certain South Danish dialects allow for the unshifted order parallel to the Swedish example (5b) above. Basbøll 1986 and Pedersen 1993 view OS as an application of the light constituent rule (letledsreglen), which applies to

'light' constituents, whereas the unshifted version follows the likeness rule (lighedsreglen), in that the word order matches that of full DP objects, as in (5c). Optional OS of weak pronouns is attested in the dialects spoken on the island of Ærø (a small island with less than 6000 inhabitants located to the east of Fyn). Examples of the unshifted and shifted orders are given in (8).

(8) a. Anders køber aldrig=dm. Ærø Danish
Anders buys never them

b. Anders køber=dm aldrig.
Anders buys them never

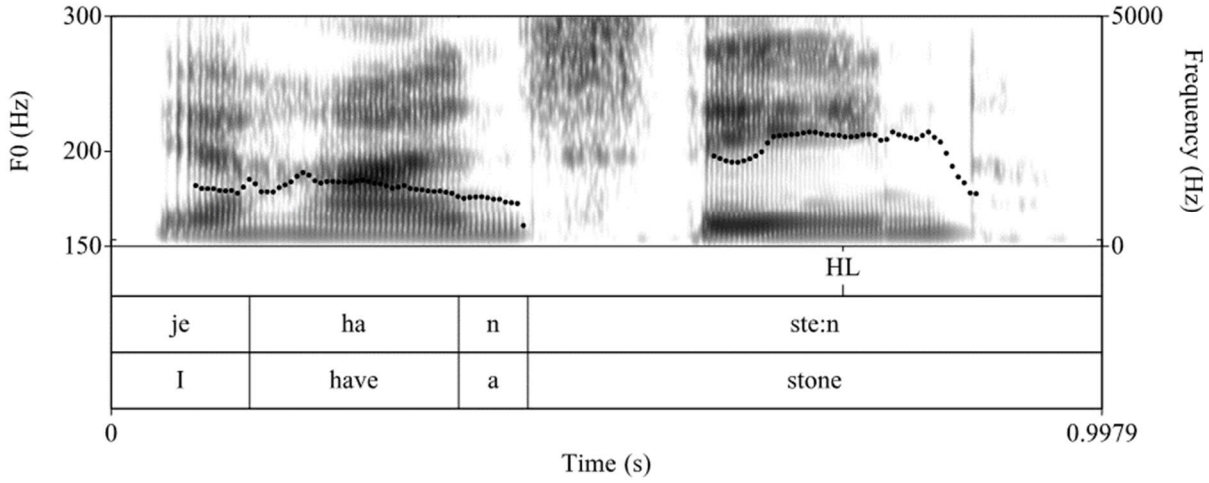
Whereas (8b) is acceptable both in Standard Danish and in Ærø Danish, (8a) is acceptable only in the Ærø dialect and the other Southern Danish dialects which have two distinct tonal accents. Such tonal distinctions have been described by a number of Danish dialect researchers (e.g., Køster 1980, Kroman 1947, Ejskjær 1993, 2005). 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 following properties are to be found in the Marstal dialect of Ærø: 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.

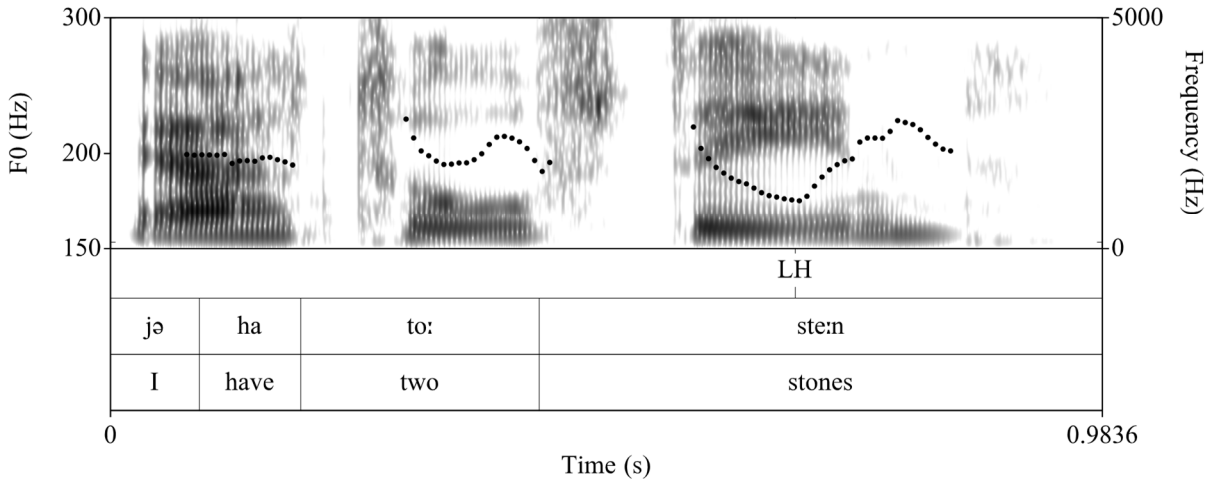
The general distributional properties of tonal accent in Ærø Danish are similar to those of Standard Swedish. Ærø Danish monosyllables, however, can also show an accent difference. For instance, according to the literature, the singular and the plural

of *sten* ‘stone’ have a tone accent difference; the singular is pronounced with Accent 1 and the plural with Accent 2. Our fieldwork confirms these patterns. Consider the PRAAT diagrams in (9) and (10) which show recordings of Ærø Accents 1 and 2 for the singular and plural of ‘stone’, respectively.

(9) Accent 1 *sten* ‘stone’



(10) Accent 2 *sten* ‘stones’



As we can see, 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. Since our fieldwork focused on OS rather than on examining the word-prosodic 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, it has not, to our knowledge, been explored before. (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 aim to show that this correlation is not coincidental, but has meaningful implications for our understanding of optional and obligatory OS.

3. Tone Accent Units (TAUs)

In section 2, we demonstrated that areas with optional OS also have a tone accent distinction. This section deals with the question of what the nature of this correlation might be. Given that we suggest a phonological solution to the problem, a crucial piece in 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 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); yet the *in situ* pronunciation is possible in varieties with tonal accent because tonal accent creates a TAU that licenses

incorporation. As we shall see, 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, the formal analysis of optional and obligatory OS.

3.1 Mismatches between Prosody and Syntax

In phonological theory, it is by now widely accepted that suprasegmental structure – that is, sound structure above the segmental level – is organized in a prosodic hierarchy (though the claim is not uncontested[4]). 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 of particular relevance for our purposes. As we demonstrate in 3.2 for Swedish, and 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 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 the observation in Riad 2013(2013, 131) that this applies to weak object pronouns, which may prosodically incorporate into a verb, forming one prosodic word. Riad exemplifies this with the verb *ˈgav* 'gave', followed by the object pronoun *henne* 'her' (pronounced [ˈhənə] in isolation). The sequence *gav henne* is pronounced as one prosodic word, [ˈgɑːvənə] '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 *henne* 'her' is evidence that the first syllable of *henne* '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.

Riad's discussion is restricted to verb + weak object pronouns. However, if we include weak subject pronouns, we may conclude that the formation of prosodic words does not depend on syntactic constituency. The sequence *jag åt* 'I ate' [jaˈoːt] in *jag åt hönan* 'I ate the chicken' forms one prosodic word, distinct from the object *hönan* 'the chicken' [ˈhøːnan], which is a prosodic word by itself: [jaˈoːtˈhøːnan] – it is possible to have a break before *hönan*. Furthermore, it would be incorrect to leave the [h] sound out in this example, *[ˈøːnan], a strong indication that the object *hönan* 'chicken' 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 may carry one stress (unless the verb is a compound), and it has

one tonal accent. When formed by a verb + a weak object pronoun, the tonal accent of the verb determines the tonal accent of the whole domain:

(11) a. *gav* 'gave' + *henne* 'her': [^{1}ˈgav]ω + [^{2}ˈhenne]ω ➔ [^{1}ˈgɑːvənə]ω

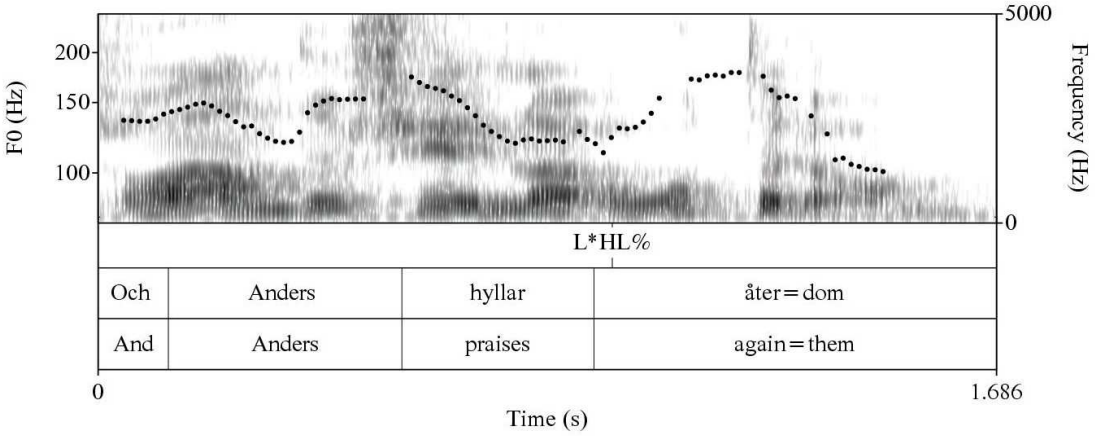
b. *gillar* 'likes'+ *det* 'it': [^{2}ˈgillar]ω + [^{1}ˈdet]ω ➔ [^{2}ˈjɪlaɖə]ω

In the examples in (11) 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.

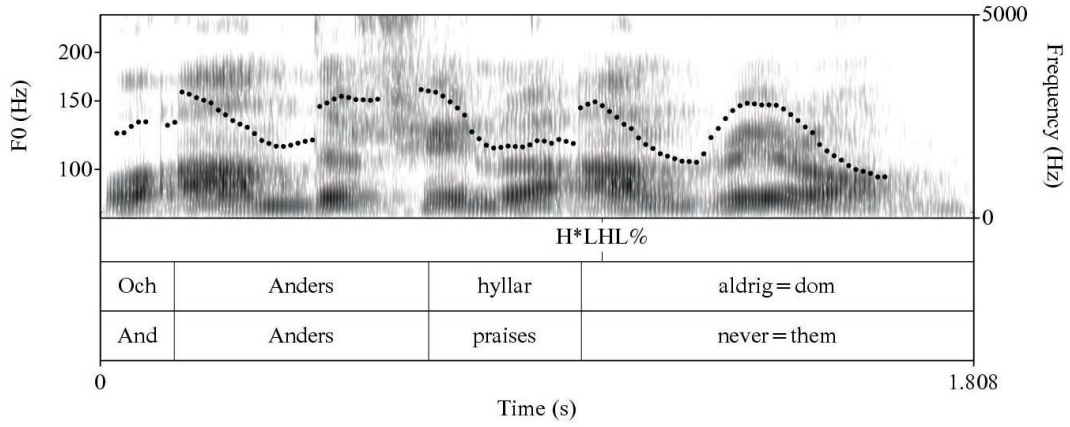
Swedish is a V2-language, and when a non-subject occupies a sentence-initial position, the subject will follow the finite verb. In such cases, weak object pronouns prosodically incorporate into the preceding noun giving rise to prosodic words, defined by one tone accent; an accent 1 noun + a weak pronoun, 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 described in Section 4.

Interestingly, we find the same tonal patterns for Accent 1 and Accent 2 adverbs + pronoun, in other words cases where OS has not applied; as pointed out above, this is an option in (most dialects of) Swedish:

(12) Accent 1 adverb + weak pronoun: *åter dom* ‘again them’.



(13) Accent 2 adverb + weak pronoun: *aldrig dom* ‘never them’.



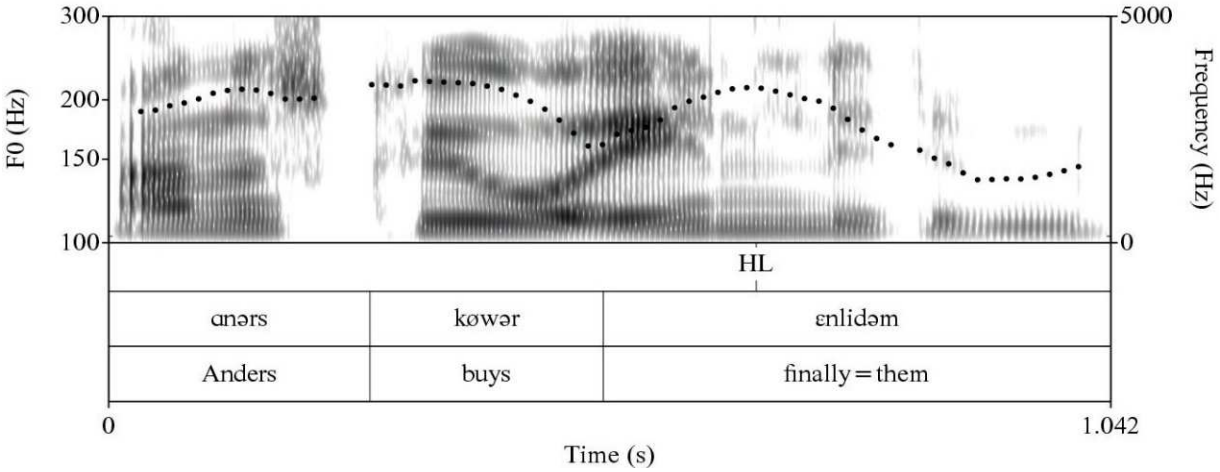
The relation between tonal accent and OS will be discussed in section 3.4. The main points in this section is that OS is optional in (most dialects of) Swedish, that pronouns may be prosodically incorporated, and that tonal accents may span over sequences of (syntactic) words. The accent of the first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

The next section examines the corresponding phenomena in the Danish dialect spoken on the island Ærø.

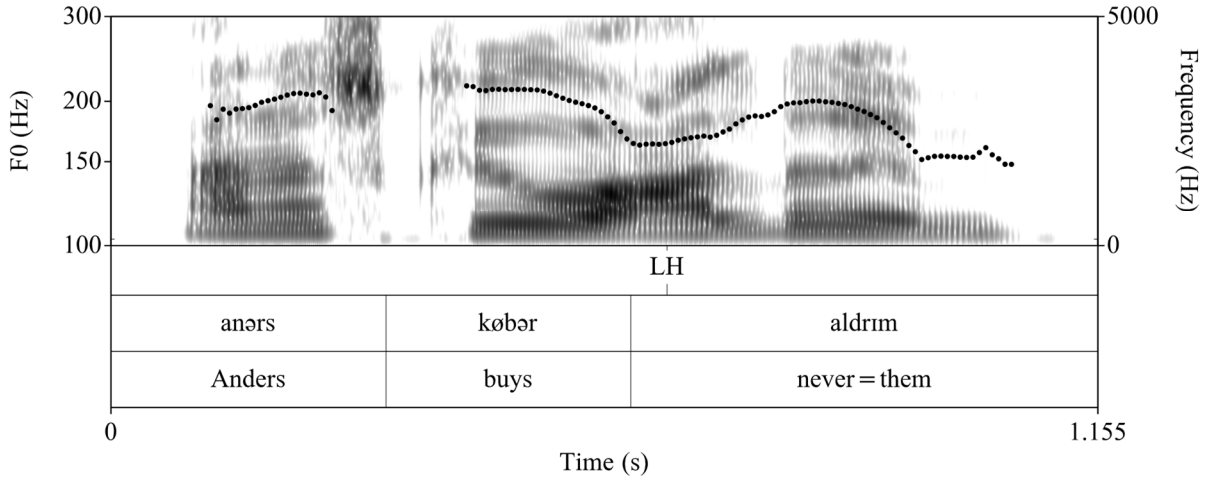
3.3 Weak pronoun Clitics and Tonal Accent in Ærø Danish

As in Swedish, the weak pronoun can be pronounced in situ as shown in (14) and (15) for Accent 1 and Accent 2 adverbs, respectively.

(14) Accent 1 adverb + clitic: *endelig dem* 'finally him'

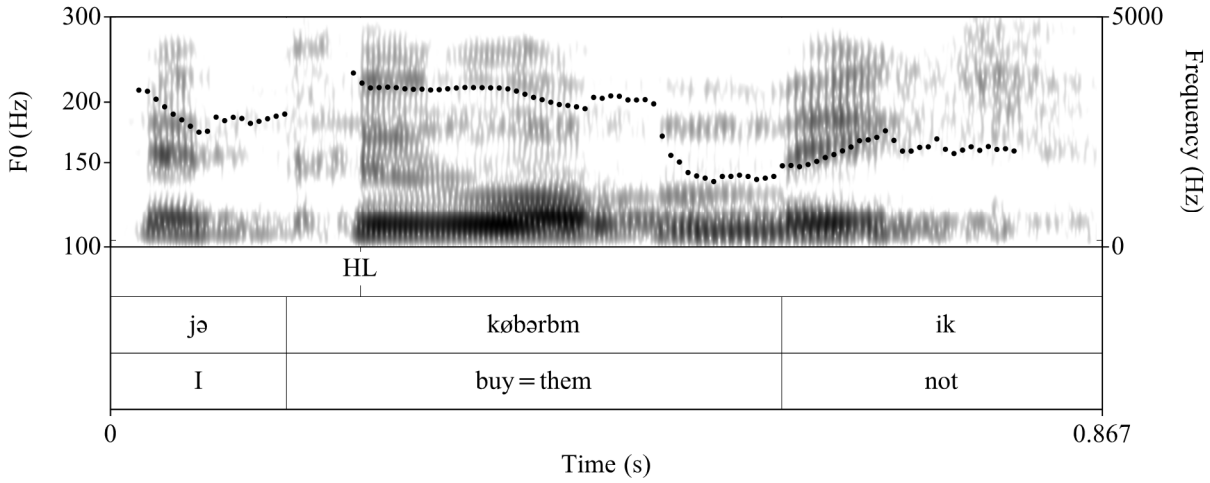


(15) Accent 2 adverb + clitic: aldri(g) dem 'never them'

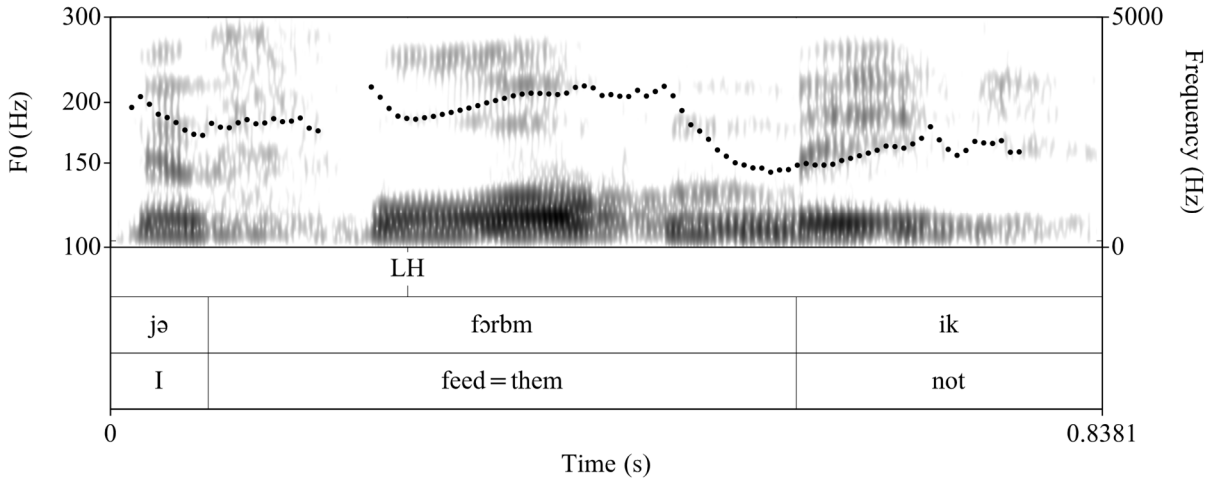


As described for Swedish the tonal unit spans the adverb and the pronoun in both accent types. (16) and (17) illustrate the shifted cases in which the weak pronoun is prosodically incorporated into the verb. Here again, the verb and the incorporated pronoun form one tonal unit.

(16) Accent 1 verb + clitic: *køber dem* 'buy them'



(17) Accent 2 verb + clitic: *fodre dem* 'feed them'



Weak object pronouns incorporate into the subject when the subject is inverted (in cases 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 1947, who observes that

when a weak unstressed word is preceded by a stressed word, it will have 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 the optionality of OS remains firm and is theoretically and typologically significant in and of itself. The next sect provides an explanation of why this correlation is to be found.

3.4 Towards an Explanation

As we have seen, varieties where OS is not obligatory allow incorporation of weak pronouns into a preceding adverb, unlike varieties with obligatory OS, where the word order adverb plus weak pronoun is disallowed. Furthermore, we have demonstrated that varieties with optional OS also have a tone-accent distinction. This correlation is what leads us to explore the possibility that phonological considerations are crucial in explaining variation in OS. We know that weak pronouns are too weak to surface independently, and that they require a prosodic host. In varieties with obligatory OS, we argue that adverbs seem have some boundary that blocks incorporation. This boundary seems to be less strong in varieties with tonal accent, meaning that adverb and weak pronoun can form a phonological unit. Accordingly, the *in-situ* pronunciation of weak pronouns is possible since incorporation is not blocked per se. This general idea fits nicely with most current approaches to the interface of syntax and phonology, where it is assumed that syntactic and phonological phrasing do not necessarily have to mirror each other. A recently discussed 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 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. Assuming that the presence of tonal accent can license optional OS, one of our goals must be to identify a property of tonal accent that would help us understand why and how it can affect word order. In short, we believe that the unifying character of tonal accent (as already observed in Haugen 1967, see the introduction) might be what permits the *in situ* pronunciation in certain varieties with tonal accent.

Tonal accent is obviously a part of the word-level phonology. At the same time, however, it is also 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 *Tonal Accent Unit*.

Tonal Accent Units 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, thereby distinguishing it from purely intonational languages like English, where (intonational) tone is purely post-lexical.[6]

A second relevant characteristic of tonal accent is the fact 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 can also 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: 239-240) observes for Standard Norwegian, "more than one syntactic constituent, that is, any word not carrying primary stress that intervenes between two syllables with primary stress [= with a tonal accent; authors], 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 pointed out to us by Tomas Riad (pers. com.), Accent 1 will have a narrower range than Accent 2 in many tone accent varieties (particularly in South Swedish). Still, the realization of tonal accent will typically extend 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.

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 referred to as *accentual phrases*, highlighting the importance of intonational pitch accents for the structuring of utterances. For instance, in Lekeitio Basque, unaccented words (i.e., words without a lexical pitch accent) are typically grouped together with the following word; accented items (words with a lexical pitch accent), on the other hand, are *always* followed by a phrase boundary (Elordieta 1997). This example shows particularly clearly that lexical tonal properties can have a

strong influence on prosodic phrasing, similar to what has been observed for varieties with tonal accent, and to what we claim facilitates optionality in OS.

As we have seen in section 3.2, weak pronouns can form a unit together with the preceding tone accent item. From a more general perspective, it has been widely observed that in varieties with tonal accent, certain prosodic constituents are defined by the presence of *one* tone-accent item. Essentially, 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 have been referred to with different names: *Accent Phrase* (Kristoffersen 2000, Abrahamsen 2003, Myrberg 2010, Morén-Duolljá 2013), *Maximal Prosodic Word* (Myrberg and Riad 2015), *Tonal Foot/Accent Unit* (e.g. Fretheim and Nilsen 1989), or *Prosodic Word* (Bruce 1998, Hansson 2003).

Aside from terminological issues, these proposals all capture the insight that in Scandinavian tonal accent varieties, some higher-level prosodic unit is defined by the presence of a tonal accent. Importantly, the formation of these units is based entirely on prosodic grounds, which shows that tonal accent can interfere with the phonology-syntax mapping. This is perfectly in line with our claim that the phonological properties of tonal accent can create higher-level phonological domain that license the *in-situ* pronunciation of weak pronouns.

A remaining general question is whether i. the presence of tonal accent formally interacts with optional OS, or whether ii. the influence of tonal accent is better regarded as a functional force that potentially strengthens the 'phonological power' of adverbs, by providing them with a unifying tonal character that makes them more suitable hosts for clitics. We think that i. is possible, but we acknowledge that our

current theoretical understanding of phonological representations of tonal accents makes it difficult to find a representational correlate of what we wish to express. Therefore, at least for the time being, we opt for ii.; yet even if the unifying character of tonal accent is not directly reflected in our formal analysis, we believe that there can be properties of the speech signal that influence the structure of language systems over time, even if these properties are not directly encoded in the representations or grammar.

4. A Prosodic Account of OS and Variation

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 for the weak pronoun to shift in order to satisfy the prosodic requirement of incorporation. Bennett, Elfner and McCloskey 2016, for example, propose prosodic movement of a weak pronouns in Irish as a prosodic repair to remove it from a "strong" position in which a weak pronoun may not occur. Another possibility is to constrain the position of the adverb. In our analysis we will go for the second alternative. Yet the order of adverbs is also known to be flexible. Keyser (1968) in his review of Jacobson 1964 proposes that various positions of adverbs correspond to the major syntactic breaks in the structure. He introduces a Transportability Convention which 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" (368). Here we pursue a way of implementing a version of the transportability convention, yet 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: 117-18). <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 adjoined on a separate plane (3D-adjoined in our terms). 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 (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. 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.

The idea that adjuncts are merged in a separate plane, a third dimension, is found already in Åfarli 1995, 1997 and developed further in 2010 specifically to account for OS. Åfarli proposes that linearization of the adjuncts takes place by a process of "bending" which linearizes the adverbs within the syntactic constituent to which they are 3D-adjoined. According to Åfarli, adverbs are not 'visible' at the point where weak pronouns incorporate; weak pronouns will incorporate into adjacent hosts to their left on the same plane, and will 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) without further ado but rules out the Swedish and Ærø data which allows for the incorporation of weak pronouns into adverbs. To remedy these shortcomings, we pursue an account of OS in which adverbs are 3D-adjoined as in Åfarli's work, but linearize the adverb at Spell Out.[8]

We repeat the basic OS data from the introduction here. (18a) shows the non-shifted order with a non-pronominal object. In the shifted order shown in (18b) and (18c), the pronoun is incorporated into a verbal and nominal host, respectively. (18d) shows the non-shifted order with an auxiliary. (18e) is ruled out in Standard Danish because adverbs do not provide legitimate hosts for incorporation. (18f) is a Swedish example illustrating weak pronoun incorporation into the adverb in Swedish. The same is true of Ærø-Danish as demonstrated in section 3.3.

(18) a. Peter mødte ikke Anders. Standard Danish
Peter met not Anders

b. Peter mødte=ham ikke.
Peter met=him not

c. Her mødte Peter=ham ikke.
Here met Peter=him not

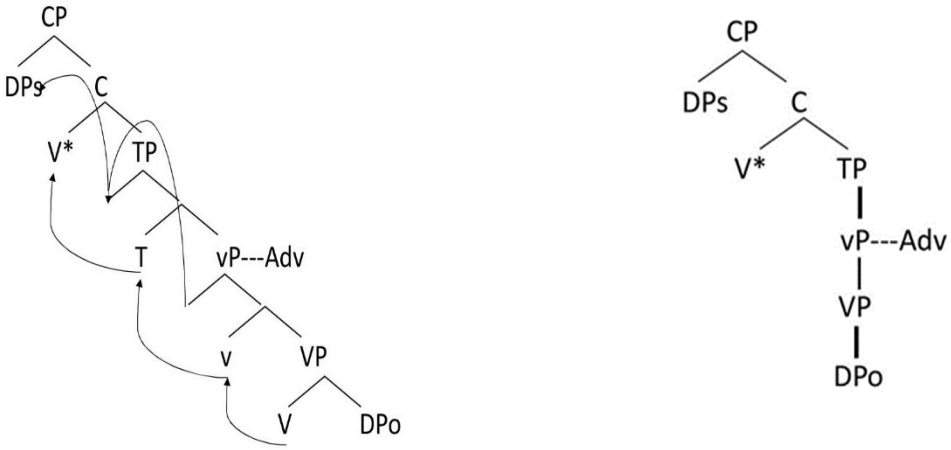
d. Peter har ikke mødt=ham.
Peter has not met=him

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

f. Peter mötte inte=honom. Swedish
Peter met not=him

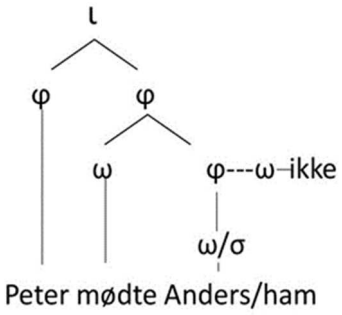
The syntactic structure of (18a) is shown in (19a). Following similar assumptions to those in Bennet et al, V* is a fusion of the syntactic features of the elements it raises through. The subject raises from spec, vP and raises to spec, CP. In this way, V2 order is derived. The line connecting the adverb is intended to represent it in a separate plane or a third dimension. (19b) shows the same tree with all null elements removed.

(19) a. b.



(20) 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.

(20)



The default linear alignment of adverbs is to the left rendering (18a) with the non-pronominal object.[9] Formally, we express the general preference for left-alignment of adverbs interacting with OS with the alignment constraint in (21); it captures Åfarli's 2010 proposal of "left-bending", it is conceptually comparable to traditional OT constraints that have been used to account for phonologically conditioned affix placement (Prince and Smolensky 2004 (1993)). As a shorthand notation, we refer to adverbs interacting with OS as 'OS-Adv'.[10]

(21) LEFTMOST (OS-Adv, ι): Assign one violation mark for every ω in the phonological representation that interferes between the left edge of an intonational phrase and a ω that corresponds to an OS-Adv 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 we observe. That is, our approach has to 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 NO SHIFT (Bennett, Elfner and McCloskey 2016):

(22) 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.

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 that it dominates. Elements in higher nodes, however, preceed 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 preceed 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 >> LEFTMOST, which correctly derives the right position of the adverb in the canonical case, that is when the object is a full DP (or a CP). This is shown in (23):

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

Syntactic structure[11] [$_{CP}$Peter [$_{C}$mødte[$_{TP\ vP}$ <$_{adv}$ikke>[$_{V}$Anders]]]]]	NoShift	Leftmost
a.→ ($_{\iota}$($_{\varphi}$Peter ($_{\varphi}$mødte ($_{\varphi}$ikke ($_{\varphi}$Anders)))))		**
b. ($_{\iota}$($_{\varphi}$Ikke ($_{\varphi}$Peter ($_{\varphi}$mødte ($_{\varphi}$Anders)))))	**!	
c. ($_{\iota}$($_{\varphi}$Peter ($_{\varphi}$mødte ($_{\varphi}$Anders ($_{\varphi}$ikke)))))		***!

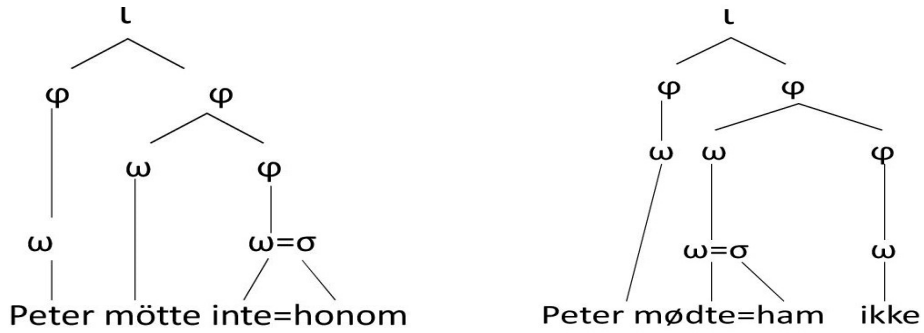
Candidate (23a) is the winner because it aligns the adverb to the left as much as possible without changing the word order provided by the syntax. Candidate (23b) does align the adverb all the way to the left of the utterance, but crucially violates NOSHIFT. Finally, Candidate (23c) puts the adverb is sentence-final position, which incurs more violations of LEFTMOST than necessary. Accordingly, on the basis of the constraints used so far, the candidate is harmonically bounded and loses. The word order in (23c), however, 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. 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 therefore cannot project a phonological phrase on its own. We express this with the constraint in (24). 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.

(24) φ → ω (possibly a universal): Assign one violation mark for every phonological phrase that does not contain a prosodic word.

Since weak pronouns cannot form their own phonological phrase, they must incorporate into a legitimate host. *In-situ* incorporation would lead to an adverb plus a weak pronoun clitic, as shown in the tree (25a); this tree corresponds to (18f), which, as we have discussed in section 3.4, is only permitted in varieties with tonal accent. Incorporation into, e.g., a verbal host, is the default option; this is, of course, what is commonly referred to as OS as shown in (25b) (corresponding to (18b)).

(25) a. b.



It has been recognized in the literature on OS that adverbs are less suitable hosts for clitics than verbs, nouns, prepositions, etc. (e.g. Åfarli 1997, Holmberg and Platzack 1995, Josefsson 1992). This property of the system 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 towards an explanation of OS, we argue that pronouns are preferably incorporated into a host from the same syntactic dimension; this is why adverbs are disprefered hosts, which in turn causes OS. In other words, prosodic words should preferably not contain elements that originate in different syntactic dimensions, but only elements from the same syntactic dimension. This is captured with the constraint in (26).

(26) *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 (27).

(27) Object shift is obligatory in Standard Danish

[$_{CP}$Peter [$_{C}$mødte[$_{TP\ vP}$ <$_{adv}$ikke>[$_{VP}$ham]]]]]	NoShift	*Multiple	Leftmost
a.→ ($_{\iota}$($_{\varphi}$Peter ($_{\varphi}$mødte=ham ($_{\varphi}$ikke))))			***
b. ($_{\iota}$($_{\varphi}$Peter ($_{\varphi}$mødte ($_{\varphi}$ikke=ham))))		*!	**
c. ($_{\iota}$($_{\varphi}$ikke ($_{\varphi}$Peter ($_{\varphi}$mødte=ham))))	**!		

Candidate (27a) 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 (27a) violates low-ranked LEFTMOST. Candidate (27b), which incorporates the weak pronoun into the adverb, fatally violates *MULTIPLE because adverb and pronoun originate from different dimensions. Candidate (27c), which aligns the adverb to 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.)

Now we account for the fact that OS is optional in varieties with tonal accent, such as Ærø Danish or Swedish. In section 3.4 we argued that this is because prosodic phrasing in these varieties is influenced by the presence of tonal accent; the salience

and unifying character of tonal accent makes it possible to incorporate a weak pronoun from one dimension into a preceding tone-accent adverb from another dimension.

In the OT analysis developed here, this means that the constraint *MULTIPLE, which militates against phonological words with elements from multiple dimensions, becomes violable. Since OS is optional, however, the analysis also has to incorporate the possibility of shift. In the tableau in (28), we achieve the desired result by arguing that in Ærø Danish and Swedish, *MULTIPLE and LEFTMOST are unranked, which means that candidates (18a) and (18b) are both legitimate output forms. (18a) fares better with regard to *MULTIPLE, while (18b) incurs fewer violations of LEFTMOST. What form is chosen in the end may be decided in the grammar, where optionality could be modelled in many different ways (e.g. Boersma 1998, Pater 2009, Coetzee 2016, among many others). Alternatively, we could assume that both surface forms are generated, and that the version that is eventually spelled out is chosen in a post-grammatical component, for instance based on extralinguistic considerations. We leave this question open; for our purposes, it is more crucial to show that both options are available.

(28) Object shift is optional in Ærø Danish and Standard Swedish

[$_{CP}$Peter [$_{C}$ mötte [$_{TP\ vP}$ <$_{adv}$inte>[$_{VP}$ honom]]]]]	NoShift	*Multiple	Leftmost
a.→ ($_{\iota}$($_{\varphi}$Peter ($_{\varphi}$mötte=honom ($_{\varphi}$inte))))			***!
b. → ($_{\iota}$($_{\varphi}$Peter ($_{\varphi}$mötte($_{\varphi}$inte=honom))))		*!	**
c. ($_{\iota}$($_{\varphi}$Inte ($_{\varphi}$Peter ($_{\varphi}$mötte=honom))))	**!		

The general analysis also applies to cases in which the subject remains in spec,TP as in yes/no-questions or when another element (e.g., an adverb or a fronted object) occupies the clause-initial position.(29a) (repeated from (18c) above) exemplifies an example with a fronted adverb in Danish and (29b) the alternate possible word order in Swedish.

(29) a. Her mødte Peter =ham ikke.
Here met Peter=him not
'Here Peter didn't meet him.'

b. Här mötte Peter inte=honom
Here met Peter not=him

This following structure is the winning candidate for (29a), comparable to (27a). 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.

(30) ($_{\iota}$($_{\varphi}$her ($_{\varphi}$mødte ($_{\varphi}$Peter=ham ($_{\varphi}$ikke)))))

The Swedish example in (29b) is parallel to (28b) and hence a legitimate candidate. (28a) is also legitimate, rendering the other possible order in Swedish equivalent to the Danish (29a).

The subject can itself be a weak pronoun as in (31a) in which case it incorporates into the verb to which it is adjacent. If both the subject and the object are pronouns as in (31b), both are incorporated forming a clitic cluster.

(31) a. Her mødte=han ikke Peter.
Here met=he not Peter
'Here he didn't see Peter.'

b. Her mødte=han=ham ikke.
Here met=he=him=not
'Here he didn't see him.'

4.1 Holmberg's Generalization

How do we account for the necessary relation between OS and verb movement out of the VP (Holmberg's generalization)? Remember that OS does not occur in subordinate clauses and not in main clauses in which an auxiliary or modal undergoes V2 as shown in (32).

(32) a. at Peter ikke så=den *at Peter den ikke så
that Peter not saw=it
'that Peter didn't see it'

b. Peter har ikke sett=den. *Peter har den ikke sett.
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 which includes the verb and the incorporated weak pronoun object as shown in (33).

(33) $(_{\iota}(_{\phi}\text{Peter}(_{\phi}\text{har}(_{\phi}\text{ikke})(_{\phi}\text{set=ham}))))$

Holmberg's generalization as formulated by Holmberg 1999 states that Scandinavian OS cannot cross any phonologically realized VP-internal material. This way of formulating Holmberg's generalization holds for the classic cases in (18) and also covers additional cases in which "any phonological visible category inside VP preceding the object position will block Object Shift" (p.2). This is the case for verb particles in Swedish which generally precede the weak object pronoun, as shown in (34). (Verb particles form a TAU with weak pronouns, on a par with verbs.[12])

(34) a. Han sparkade inte ut bollen/den. Swedish
he kicked not out ball.the/it
'He didn't kick out the ball/it.'

b. *Han sparkade den inte ut. Swedish
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 (23). In Danish, however, the particle must follow the object and OS is therefore obligatory.

(35) a. Han sparkede ikke bolden/*den ud. Danish
he kicked not ball.the out.

b. Han sparkede den ikke ud.
he kicked it not out

(35a) is ruled out in standard Danish because adverbs cannot host weak pronouns, and therefore OS is required as it is in the standard case.

There is a small number of "Danish style" verb particles in Swedish, i.e. verb particles that optionally may follow the object pronoun, for instance *med* 'with', as in (36):

(36) Hon tog (dem) inte (dem) med till kalaset. Swedish
She took (them) not (them) with to party.the
'She brought them/the children to the party.'

As (36) 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 (28). This provides further support for our analysis of OS as driven by phonological constraints.

Double object constructions are another case which is 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 possible word order is shown (for Danish) (37a) and the ungrammatical shifted order is shown (37b).[13]

(37) a. Jeg viste ikke engang Peter bogen/den.
I showed not even Peter book.the/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.[14]

A complication is provided by the Swedish example in (38) which is ungrammatical in Danish where the adverb must follow the verb.

(38)	Jag	gav	Elsa	inte	bogen/den.	Swedish
	I	gave	Elsa	not	book.the/it	

We predict 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 object and the direct one 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 paper.

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 in spite of 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.

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

Fenno-Swedish lacks tone-accent distinctions (Malmberg 1971: 127; Selenius 1972; Bruce 2010, 180; Huhtamäki 2015) 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, 17 provides a list of "function words with short stressed syllables in Helsinki Swedish", among them pronouns, such as *honom* '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, as compared to 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 as to whether a language or dialect need avail itself of such an option. In fact, it does 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 (in spite of the presence of tonal distinctions). In the dialect of Trøndersk spoken in most parts of Trøndelag (e.g., Trondheim), however, negation undergoes apocope (ikkje → itj) 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 *såg itj'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 true that would be a bone fide counterexample to our proposal. The following example is from Pedersen 1993, 205:

(39) Pronounced [jæ ve' jund də] (FaIster)
jeg ved jo=inte=det
I know=as.you.know=not=it

However, as in Trøndersk, the dialect has apocope; negation, *ikke*, which in standard Danish has two syllables, is pronounced *ik* or *int* in the Falster dialect.[15] 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 (39) is hosted by the verb. Our hypothesis was confirmed by the data we collected from our informants. In-situ pronouns were only found 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. 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 which cliticize into the verbs themselves, forming a clitic-cluster with the following weak pronouns.

We have made no claim as to the availability of OS in cases where tonal distinctions enable the in-situ pronunciation of the weak pronoun. Oevdalian which has been claimed to only allow the in-situ option is therefore not a counterexample to our proposal.[16] The claim is ultimately based on Levander 1909. Still it would be surprising if this variety would differ from standard Swedish in this manner. Interestingly it is the same misreading of the data found in Falster-Danish that is also the cause of much misleading discussion of Oevdalian. Levander only relates to the order of clitic negation and an object in which negation and the object form a clitic cluster incorporated into the verb. We conclude that the misconception of Oevdalian is due to the same phenomenon as in Norwegian Trøndersk and in Lolland-Falster Danish, in which the clitic adverb and the weak pronoun form a clitic cluster. As can be gathered from other sources, for example Åkerberg 2012, OS is indeed available in Oevdalian, with sentence adverbs other than the weak negation.

6. Conclusions

In this paper 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 which have tonal distinctions. Whereas an abundance of research on the tonal distinctions of Swedish can be found, the only source for a 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. We have recorded five different speakers of this dialect focusing on the tonal accents and their instantiation in cases of pronoun incorporation. And whereas the existence of tonal accents as well as 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 attempted to argue for this correlation and offered an explanation for why this correlation is to be found.

Another contribution of our paper is to add another case to the growing set of phenomena for which a purely phonological account can be argued for and to reach 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. In the introduction we listed a number of such accounts. One problem with approaches of this type is that there is no syntactic trigger for OS, certainly not for Mainland Scandinavian OS, which is restricted to weak pronouns. Moreover, such an approach does not offer an explanation of the optionality of OS in tonal dialects which we have offered here.

One of the important criteria that follows from minimalist architecture is that movement which has semantic import must occur in the syntax. Mainland Scandinavian OS, we claim, does not belong in this category since it is the requirement of weak pronouns to incorporate that is at the basis of our analysis and not their status as topics. OS of weak pronouns therefore does not shed any light on this issue. 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 also follows.[17] 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).[18] Topics which might shed light on these interfaces are the tendency for pronouns referring to propositions not to shift (Andréasson 2008, 2010) and Long OS (e.g., Josefsson 1992, 2003, 2010, Berger 2015).

The view that OS involves prosodic features is not new (e.g., Hellan 1994, Erteschik-Shir 2005a, 2005b, 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 paper together with other proposals to explain word order as 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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Endnotes

[1] Following Selkirk 1996, 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." (p. 193). Mainland Scandinavian weak pronouns display similar properties. Note that weak pronouns both in English and in Mainland Scandinavian may be pronounced fully in careful speech. We believe that this may best be regarded as a matter of performance and does not detract from their status as being weak.

[2] We limit the discussion to the incorporation of weak pronouns into a *preceding* host and exclude discussion of incorporation of weak pronouns into a following host since the latter is not relevant to the discussion of 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:

i. ja=mødte Peter i går.
   I met Peter yesterday

[3] https://dialekt.ku.dk/dialektkort/.On card 3 ("Kort 3"), dark blue indicates the area in question.

[4] See, e.g., Scheer's 2008 arguments against hierarchies in phonology, or Samuels' 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)."

[6] This in turn might be a reason that 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. There have been debates as to how stød should be analyzed phonologically, one of these possibilities being a tonal analysis (e.g. Gussenhoven 2004, 2008 for discussion). On the basis of experimental evidence, it has been argued, however, that stød does not carry any identifiable tonal characteristics (Grønnum, Vazquez-Larruscaín and Basbøll 2013). This suggests that the main correlate of stød does indeed seem to be the glottal closure, which would imply that stød is a local phenomenon that does not directly interact with phrase-level intonation, unlike tonal accent.

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

[8] 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 and the concomitant phonological prominence of the various constituents as well as the weight of each adverb. Åfarli argues that scope, for example, can be read off the 2D syntactic structure. This option is not available to us if the linearization is post-syntactic. 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 paper, a model of the interfaces must be developed that takes these interactions into account.

[9] Although most adverbs linearize to the left, some VP adverbs follow the object:

i. De reparerede alle bilerne ofte/*grundigt*.
They repaired all cars-the often/thoroughly.

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

ii. De reparerede ofte alle bilerne.
They repaired often all cars-the

The scope of the adverb depends not only on the positions of the adverbs but also on the stress assigned to them and/or to the other constituents in the sentence as expected. 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 lexically in part and since such adverbs do not interact with OS, we posit for the purposes of this paper that adverbs preferably linearize to the left.

[10] Adverbs, including some, but not all, OS-adverbs, do occur sentence initially:

i. Troligen mötte Peter inte Anders.
Probably met Peter not Anders

These have been accounted for as syntactic A'-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. (See also note 8)

(Berwick and Chomsky 2011). We assume that the attachment site of these adverbs is higher in the structure and therefore do not interact with OS.

[11] The brackets around the adverb signify that it is attached in a third dimension.

[12] In Swedish, for example, a verb particle + a weak object pronoun generally form a Tone 1 TAU.

[13] According to Vikner 1989, 151 a sentence parallel to (37)a 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 til Peter." This has to do with information structure which determines the preferred order of objects in these constructions. Pronouns which are highly topical precede less topical elements. (For details see Erteschik-Shir 1979.)

[14] The structure of the double object construction has been discussed vividly in the literature. We follow Platzack 2011:100 a.o. in assuming that the indrect object is located in a separate projection; in other words it is not adjoined to the VP. Thanks to a reviewer to pointing out this unclarity in a previous version of the paper.

[15] Engdahl (pers.com.) 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 object shift). In any other position it is pronounced either fully with voicing of the consonant or without the final shwa but retaining the voiced consonant, indicating the phonological presence of the shwa.

[16] For example Garbacz 2010, Hellan and Platzack 1999, Hosono 2013, Garbacz and Rosenkvist 2007, Garbacz and Johannessen 2015.

[17] Diesing and Jelinek 1993 consider the shifted element to be in the restriction and the non-shifted one to be in the nuclear scope rendering the correct scopal interpretations.

[18] "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, to which we return below." (Berwick and Chomsky 2011:29) See also note 8 concerning the interaction between phonology and information structure.