

Weak Function Word Shift*

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Abstract:

The fact that object shift only affects weak pronouns in mainland Scandinavian is seen as an instance of a more general observation that can be made in all Germanic languages: weak function words tend to avoid the edges of larger prosodic domains. This generalisation has been formulated within Optimality Theory in terms of alignment constraints on prosodic structure by Selkirk (1996) in explaining the distribution of prosodically strong and weak forms of English function words, especially modal verbs, prepositions and pronouns. But a purely phonological account fails to integrate the syntactic licensing conditions for object shift in an appropriate way. The standard semantico-syntactic accounts of object shift, on the other hand, fail to explain why it is only weak pronouns that undergo object shift. This paper uses an Optimality theoretic model of the syntax-phonology interface which determines linear order by the interaction of syntactic and prosodic factors. The account can successfully be applied to further related phenomena in English and German.

1 Introduction

Weak function words in the Germanic languages have prosodic properties in common that have often been overlooked, especially by syntacticians. Once, these properties are taken into account, a number of seemingly very different syntactic phenomena can receive a common explanation. The phenomenon we will mainly address is pronominal object shift (OS) in Scandinavian, exemplified in (1).¹ OS has usually been given an explanation in syntactic and/or semantic, especially information structural terms, including the fact that only “weak” elements can undergo OS. For Swedish, OS of weak pronouns has generally been reported to be optional, while it is obligatory in Danish (cf. Vikner 2001) – the “%” in (1a) signals that the clause is dispreferred, but not ungrammatical. Stressed pronouns do not shift.

- (1) Weak pronoun object shift in Swedish:
- a. Jag kysste henne/*HENNE inte (%henne/HENNE)
I kissed her/ *HER not (%her/ HER)
 - b. Jag kysste (*Marit) inte Marit
I kissed (*Marit) not Marit
- (cf. Holmberg 1999: 1; Sells 2001: 44f)

One problem with an account in terms of information structure is that (1a,b) can be used in the same context under the same information structural conditions, for example, as an answer to the

question “Did you kiss Marit? ”. It is therefore very likely that this syntactic contrast does not reflect a semantic difference. I will discuss this problem in section 2.

Selkirk (1996) deals with the ban on weak forms of function words in phrase-final positions in English, as exemplified in (2):

- (2) I can eat more than Sara *cán* [kæn], *[kən], *[kɨ]

Selkirk argues that this ban is due to the prosodic deficiency of (especially mono-syllabic) weak function words: they lack word stress and therefore do not constitute prosodic words. They are either reduced, or, if they are syllabic, then they are schwa syllables and therefore cannot bear stress.

English also displays an interesting restriction on the placement of pronouns which is reminiscent of the Scandinavian facts, as illustrated with the minimal pairs in (3).

- (3) a. I gave up the plan/*it I gave the plan/it up
b. I gave it to Mary / *I gave Mary it

An obvious counterexample like “I like it” in fact shows the parallelism. OS in Scandinavian is limited to cases where the verb and other material usually preceding the weak pronoun are moved out of VP. This fact is known as ‘Holmberg’s generalisation’ – it will be discussed in more detail in section 2. Weak pronouns in final positions in both English and Scandinavian are thus unacceptable only if there is a syntactically legitimate alternative structure.

Like Swedish, German avoids weak pronouns to the right of adverbs. This can be observed with both object and subject pronouns:²

- (4) German object pronouns:
a. Warum liest Peter (es) nie (*es)?
Why reads P. (it) never (*it)?
b. Warum liest Peter (das Buch) nie (das Buch)
Why reads P. (the book) never (the book)
(Vikner 2001: 323)

- (5) German subject (and expletive) pronouns:
a. Heute wird *bestimmt es regnen/ √ es bestimmt regnen
today will *certainly it rain/ it certainly rain
b. Dann hat wohl *er/ ER gelogen
then has seemingly *he/HE lied
c. Dann hat (Peter) wohl (Peter) gelogen
then has (Peter) seemingly (Peter) lied

The ban on weak subject pronouns to the right of adverbials has also been reported for Swedish, as exemplified in (6).

- (6) Swedish subject pronouns:
- a. Igår tog inte Kalle med sig sina pengar
yesterday carried not K. with SELF his money
 - b. Igår tog inte *han/HAN med sig sina pengar
yesterday carried not *he/HE with SELF his money
 - c. Igår tog han inte med sig sina pengar
- (Hellan and Platzack 1995: 50)

In (Schmid and Vogel 2004), we present data from the German dialect of Upper Hessian where the present perfect auxiliaries built of ‘haben’ (‘have’) are true weak function words. They cannot be stressed, and they may not occur clause-finally in 3-verb clusters (7a), but have to remain in final position in 2-verb complexes (7b):

- (7) Upper Hessian (German dialect from the region about 30-100 km north of Frankfurt/Main):
- a. weil er es Lied (hot) singe (hot) misse (*hot) / (*gemisst hot)
because he the song (has) sing-INF (has) must-INF (*has) / (must-PART has)
(cf. Schmid and Vogel 2004)
 - b. Wäi er es gesunge hot /??hot gesunge
as he it sung has /?? has sung

In (Schmid and Vogel 2004), we argue that the extraordinary word order flexibility of perfect tense verbal complexes as in (7a) is in part due to the IPP (“Infinitivus pro participio”) property of modal verbs: they exceptionally need not appear as participles, but may alternatively be realised as infinitives. While participles require the temporal auxiliary to their right as a morpho-syntactic licensing condition, the infinitival form does not need to be licensed (cf. also Schmid 2000, 2002). Just as in the case of English, German and Scandinavian weak pronouns discussed above, the prohibition against the weak auxiliary at the right edge in Upper Hessian is restricted to contexts like (7a) where a morpho-syntactically legitimate alternative is available. In (7b), auxiliary shift is blocked for morpho-syntactic reasons, and the auxiliary may remain at the right edge.

We attributed the effect observed in (7a) to a constraint we called “*WEAKFINAL”. Citing Selkirk’s (1996) work on weak function words in English, we elaborated an account of these facts very much along the lines of what I will pursue here.

I will argue in this paper that all these facts have a common source, namely, the ban on weak function words at edges of prosodic domains, as observed for English by Selkirk (1996). In section 3, I will discuss her approach in more detail. We will see that it needs to be complemented with a syntactic perspective to correctly predict weak function word *shift*. In section 4, I will propose an

Optimality theoretic model of the syntax-phonology interface where Selkirk's prosodic constraints interact at a level playing field with syntactic constraints on the linearisation of words. I will then show how this account derives the pronoun facts in Scandinavian, English and German.

2 Object Shift

From the generative syntactic literature, one can easily get the impression that object shift is a quite idiosyncratic feature of the Scandinavian languages. But as suggested in section 1, this might be a matter of perspective. Our point of departure is the fact that not all NP objects undergo object shift in the mainland Scandinavian languages, but only weak pronouns. This is exemplified with the Danish examples in (8).

- (8) Object shift in Danish:
- a. *Hvorfor læste Peter aldrig *den*?
 - b. Hvorfor læste Peter *den* aldrig ?
Why read P. (it) never (it)
 - c. Hvorfor læste Peter aldrig *den her bog* ?
 - d. *Hvorfor læste Peter *den her bog* aldrig ?
Why read P. (this book) never (this book)
- (Vikner 200: 321)

(8a) shows that a weak pronoun following an adverbial is ungrammatical in Danish. The pronoun has to precede the adverb (8b). With a full NP like 'den her bog' it is the other way around.

The Swedish examples in (9) show that object shift is restricted to cases where the object is adjacent to an adverb. Whenever the object would have to cross other material, like the verbal participle in (9a,b), object shift is not allowed.³

- (9) Weak object pronoun shift in Swedish:
- a. *Jag har henne inte kysst
I have her not kissed
 - b. Jag har inte kysst henne
I have not kissed her
 - c. Jag kysste henne inte
I kissed her not
 - d. %Jag kysste inte henne
I kissed not her
- (Swedish, Holmberg 1999: 1; Sells 2001: 44)

As already mentioned, contrary to Danish, Swedish allows the weak pronoun to remain behind the adverb, though this is not the preferred option. That not only the verb, but any VP-internal element may block object shift, is illustrated in (10):

- (10) Swedish, OS blocked:
- a. *Jag talade henne_i inte med t_i
I spoke her not with
 - b. *Jag gav den_i inte Elsa t_i
I gave it not Elsa
 - c. *Dom kastade mej_i inte ut t_i
They threw me not out
- (Holmberg 1986; Sells 2001: 47f)

In each of these cases, the pronoun has to stay within VP, in the position indicated by the trace. This observation is the core of “Holmberg’s Generalisation” (Holmberg 1986). More recently, Holmberg (1999) formulated it as a surface filter:

- (11) Holmberg’s generalisation (Holmberg 1999: 15):
Object Shift cannot apply across a phonologically visible category asymmetrically c-commanding the object position except adjuncts.

Not only object pronouns shift. Josefsson (2003), following Hellan and Platzack (1995), shows that subcategorised pronominal adverbials behave the same in Swedish:

- (12) a. Därför bor Sten (*i Lund) inte i Lund längre
therefore lives Sten (*in Lund) not in Lund anymore
b. Därför bor Sten (där) inte där längre
therefore lives Sten (there) not there anymore

This observation calls one traditional syntactic explanation of OS into question. Starting with Holmberg (1986), many researchers⁴ assumed that OS is driven by case, and in particular, that the landing site of OS is the position where the object receives case. Such an explanation would not carry over to (12b), unless one claimed that the adverbial pro-form “där” needed to be assigned structural case – a counterintuitive stipulation under which we would lose other important distinctions, for instance that between structural case and oblique forms.

Holmberg (1999) adds another important observation that to him renders the explanation of OS in terms of case theory untenable. If the structure in (13a) is derived purely syntactically, then, under standard assumptions, it cannot be derived without violating cyclicity:

- (13) OS and verb fronting:
- a. Kysst har jag henne inte (bara hållit henne i handen)
kissed have I her not (only held her by the-hand)
 - b. *Kysst har jag Marit inte
kissed have I Marit not
 - c. ?Kysst har jag inte Marit
- (Holmberg 1999: 7ff)

Holmberg's argumentation can be summarised very roughly as follows: if OS in (13a) has applied after the verb has moved to the front, then OS is a counter-cyclic operation. If the fronting of the verb is VP movement, a standard assumption, then the object must have left the VP before VP fronting, violating Holmberg's generalisation. If it does not leave VP, it has to move along with the verb:

- (14) $[_{VP} \text{ kysst henne}]_i \text{ har jag inte } t_i$
 $[_{VP} \text{ kissed her}]_i \text{ have I not } t_i$

(14) is also grammatical. The question is, why? If the trigger for OS is the pronoun's need to be assigned case in a functional projection on top of VP, then it might not be assigned case in (14), and (14) should be blocked by (13a), because in the latter case the pronoun receives case. However, a standard assumption is that the pronoun is assigned case in situ in structures like (14), by V. But then, why is (13a) possible? Holmberg concludes that the verb fronting in (13) is an instance of head movement.

The assumption of head movement to a non-head position is problematic in itself. However, as it stands, it seems to be the only way to have OS in (13a) without violating Holmberg's generalisation, a restriction of which we know that it holds. But if (13a) is derived by head movement of the verb to [Spec,CP] followed by movement of the pronoun in front of the negation, then this latter step is counter-cyclic, because it targets a node that is below the top node of the syntactic tree. It therefore violates Chomsky's (1993) "Extension Condition".

- (15) *The Extension Condition:*
 Substitution operations always extend their target.
 (Chomsky 1993)

Holmberg argues that, given the Extension Condition, OS cannot be substitution. It is either adjunction (as argued by Holmberg and Platzack, 1995), or a PF operation. Under both alternatives, OS has to apply post-cyclically, it is not an operation of syntax proper.⁵

- (16) Derivation of (13a) according to Holmberg (1999):
 a. **Step 1** – V-fronting as head movement into an XP position:
 $[_{CP} V_i [_{C'} C^0 \dots \text{inte } [_{VP} t_i \text{OBJ}]]]$
 b. **Step 2** – Object shift as post-cyclic movement:
 $[_{CP} V_i [_{C'} C^0 \dots \text{OBJ}_j \text{inte } [_{VP} t_i t_j]]]]$

Object shift is part of "Stylistic Syntax", as Holmberg calls it. Stylistic syntax operates on the output of "Formal syntax" which includes merge and move operations, as well as the checking of abstract features. After completion of Formal syntax, phonological features, 'p-features', are inserted. A second cycle of syntactic operations starts. They are triggered by licensing needs of those p-features. In Stylistic Syntax, the extension condition no longer holds. OS in this approach is adjunction of the moved object triggered by its p-feature.

Holmberg claims that the p-feature in case is [\pm Foc], a specification whether the item in question is part of the focus or not. Weak pronouns are obligatorily [-Foc], full NPs can be [+Foc] or [-Foc].

Holmberg (1999: 23) assumes the partition of clause structure that has been proposed by Diesing (1992): VP is the focus domain of the clause, material outside VP belongs to the ‘presupposition domain’. Thus, the feature is clearly semantically motivated, and refers to information structural properties. One objection against such a view is the fact that the asymmetry between full NPs and weak pronouns remains under identical information structural conditions. This has already been shown in Vikner’s (2001) example (8) from Danish, repeated below:

- (17) Object shift in Danish (=8):
- a. Hvorfor læste Peter (*den*) aldrig (**den*)?
Why read Peter (it) never (**it*)
 - b. Hvorfor læste Peter (**den her bog*) aldrig (*den her bog*)?
Why read Peter (**this book*) never (this book)
- (Vikner 2001: 321)

These questions can be uttered within the same context. The NPs ‘*den*’ and ‘*den her bog*’ could refer to the same previously mentioned entity. But still, OS would be ruled out for the full NP. This is not to say that it is impossible to state Holmberg’s account in an empirically correct way. But given examples like (17), it seems counterintuitive that the feature that drives OS reflects the information structural notion of focus.

Holmberg’s objection against a phonological approach is that it fails to account for object shift of full NPs in Icelandic. But this is only a failure, if one assumes that weak pronoun OS in Scandinavian and full NP OS in Icelandic have the same single cause. This need not necessarily be so.

OS is obligatory for Icelandic weak pronouns, too, but, in addition, optional for Icelandic full NPs, with the interpretative effect that non-specific indefinite NPs may never shift, while shifted indefinite NPs are necessarily interpreted as specific (see Vikner 2001 for a detailed discussion). Hence, the most natural assumption for Icelandic would be that OS is triggered by the semantic feature [\pm specific]. Specificity is independent of information structure, as the English example in (18) shows.

- (18) A: Who reads books?
B: JOHN reads books

The specificity of ‘*books*’ does not change from A to B, while its information structural status changes from NEW to GIVEN.⁶

To sum up, the licensing feature for weak pronoun OS, called [\pm Foc] by Holmberg, is very unlikely to be a semantic feature, this is why he calls it a “p-feature”. As Holmberg (1999: 27f) himself already suggests, the phonological properties of weak pronouns as such seem to be crucial here, in particular their lacking of word stress. Instead of looking for a phonological theory of weak pronouns, however, Holmberg is sort of “reinventing the wheel” when proposing a syntactic licensing mechanism. Similar criticism applies to recent accounts by Erteshik-Shir (2002) and Fox and Pesetsky (to appear). Though very different in technical execution, both approaches enrich the abstract syntactic apparatus with additional mechanisms to implement the observed prosodic effects. But without an understanding of the underlying prosodic regularities, and their integration into the theory, these accounts appear as stipulative as Holmberg’s.

Erteschik-Shir (2002) assumes that the weak pronoun cliticises onto the verb and is carried along with it in verb-second movement. However, the ordering restrictions that follow from such an analysis do not always fit the facts. The pronoun is clearly not required to be right-adjacent to the finite verb. More generally, the restriction that drives OS looks more like a constraint that determines where a weak pronoun may NOT be, rather than where it is supposed to be.

An analysis of the prosodic properties of weak function words has been developed by Selkirk (1996). It will be the topic of the next section.

3 The prosodic account by Selkirk (1996)

Selkirk (1996) deals with an interesting prosodic restriction on English function words:

“[...] in English, monosyllabic function words may appear in either a stressless “weak” form or a “stressed” form, depending on their position in the sentence, whereas a lexical category word always appears in a stressed unreduced form. [...]” (Selkirk 1996: 187)

As a consequence, lexical words always constitute prosodic words (PWd), while this is optional for function words. Selkirk gives the following four possibilities for function words – ‘PPh’ stands for ‘phonological phrase’, ‘fnc’ for function words, ‘lex’ for non-functional lexical words.

- (19) Possible prosodic realisations of English monosyllabic function words (Selkirk 1996: 188):
- | | | |
|------|------------------------|--|
| i. | Prosodic word | (<i>fnc</i>) _{PWd} (<i>lex</i>) _{PWd}) _{PPh} |
| | Prosodic clitics: | |
| ii. | <i>free clitic</i> | (<i>fnc</i> (<i>lex</i>) _{PWd}) _{PPh} |
| iii. | <i>internal clitic</i> | ((<i>fnc lex</i>) _{PWd}) _{PPh} |
| iv. | <i>affixal clitic</i> | ((<i>fnc</i> (<i>lex</i>) _{PWd}) _{PWd}) _{PPh} |

Stressed function words project a PWd. Unstressed ones can be free clitics, integrating into a PPh, internal clitics, integrating into a PWd, or affixal clitics, where they are kind of adjuncts to prosodic words. Selkirk argues for a free clitic analysis for most English function words. But, interestingly, she is forced to exceptionally assume an affixal clitic analysis in her account of English weak pronouns. From a conceptual standpoint, affixal clitics are problematic: weak function words by definition lack the ability to take part in prosodic structure building. If this is so, how can they cause the recursion of a PWd boundary? We will see below that an affixal clitic analysis can be avoided if syntactic factors are taken into account.

Prosodic structure is hierarchically organised. Utterances (‘Utt’) are built of and headed by intonation phrases (‘IP’), these are built of and headed by phonological phrases, the next lower levels are prosodic word, foot (‘Ft’) and syllable (σ). Selkirk proposes a number of optimality theoretic, i.e., violable constraints on prosodic structure formation. Examples are given in (20).

- (20) Constraints on prosodic structure (Selkirk 1996: 190):
- a. *Layeredness*

No C_i dominates a $C_j, j > i$,
e.g. “No σ dominates a Ft”

b. *Headedness*

Any C_i must dominate a C_{i-1} (except if $C_i = \sigma$),
e.g. “A PWd must dominate a Ft”

c. *Exhaustivity*

No C_i immediately dominates a constituent $C_j, j < i-1$,
e.g. “No PWd immediately dominates a σ ”

d. *Nonrecursivity*

No C_i dominates $C_j, j = i$,
e.g. “No Ft dominates a Ft”

The examples in (21) show that the strong version of function words is required at the right edge of a larger prosodic domain (cf. Selkirk 1996):

- | | | |
|------|---|----------------------|
| (21) | a. I can eat more than Sara <i>cán</i> | [kæn], *[kən], *[kɪ] |
| | b. Wherever Ray <i>ís</i> , he’s having a good time | [ɪz], *[z] |
| | c. What did you look <i>át</i> yesterday? | [æt], *[ət] |
| | d. Who did you do it <i>fór</i> that time? | [fɔr], *[fɪ] |

The italicised function words all occur in their strong versions. While the first instance of ‘*can*’ in (21a) is preferably weak, its second occurrence must not be weak. Here, it is in clause-final position. The positions of the other italicised words in (21b-d) are not clause-final, but they are final in their phonological phrases.

These observations lead to the assumption of another constraint on prosodic structure formation that requires the right edge of a phonological phrase to be aligned with the right edge of a prosodic word:

- (22) Phonological phrase alignment (Selkirk 1996: 202):
Align(PPh, R; PWd, R) (= ALIGNPPhR)

Selkirk further introduces constraints that favour lexical words to project prosodic words and prosodic words to be headed by lexical words. These constraints, together with what was introduced above, derive the following features of English prosodic phonology:

- Prosodic Words tend to be built of lexical categories
- Strong forms of function words occur if the function word
 - is isolated
 - is focused

- is at the edge of a phonological phrase

Weak forms of function words are seen as instances of free clitics. They do not project prosodic words, nor are they integrated into other prosodic words, rather, they are sort of “floating” within phonological phrases. In principle, such a treatment should also be possible for weak pronouns, and it appears to be quite attractive to view weak pronouns in Scandinavian as free clitics.

Selkirk does not discuss these cases, but she recognises a problem that occurs with English pronouns. Contrary to modal verbs, copula verbs and prepositions as displayed in (22), weak pronouns can occur clause-finally:

- (23) We need'm (= ‘need him/them’)

The constraint ALIGNPPhR plays a prominent role in explaining the behaviour of prepositions, modals and copulas. But this now becomes problematic, as it incorrectly predicts that the pronoun must project a prosodic word in (23). Selkirk suggests the following way out of this dilemma: pronouns can exceptionally be affixal clitics. She motivates this move with the phenomenon of ‘intrusive *-r*’ in Eastern Massachusetts dialects, as observed by McCarthy (1991; 1993). He showed that the ‘*-r*’ occurs at the right edges of prosodic words, as in (24a).

- (24) a. He put the tuna-*r* on the table
 b. I’m gonna(*-*r*) ask Adrian
 c. I saw ya-*r* and asked about it

Example (24b) shows that the right boundary of a weak function word does not license intrusive ‘*-r*’. However, in (24c), we have it after a weak pronoun. If the empirical generalisation is correct, then the ‘*-r*’ is attached to the right boundary of a PWd. This boundary cannot be the one of the pronoun, because it is weak and does not itself project a PWd. Selkirk then assumes that we have the right boundary of the prosodic word “*saw*” here. Thus, we must assume a layered structure with a recursive PWd boundary:

- (25) ((saw)_{PWd} ya)_{PWd}

Three objections to this analysis suggest, to my mind, that the picture Selkirk draws is at least incomplete. First, the evidence in (24c) might also support a free clitic analysis, as the ‘*-r*’ also appears at the right boundary of a phonological phrase here, and the example might simply show that the right boundary of a PPh also licenses intrusive ‘*-r*’. The empirical generalisation about intrusive ‘*-r*’ could thus be restated as in (26).

- (26) Revised empirical generalisation about intrusive ‘*-r*’ insertion:

Intrusive ‘-r’ may appear at the right edge of a PWd or at the right edge of a PPh.

Under the assumption (26), a free clitic analysis for (24c) is still possible. It is, in fact, impossible to decide whether the ‘-r’ is possible because it is at the right edge of a PWd, or because it is only at the right edge of a PPh. PPhs are usually right-aligned with PWds, and we know independently that right PWd boundaries license ‘-r’. If ‘-r’ was impossible in (24c), this would be evidence in favour of a free clitic analysis for “ya” and for the claim that ‘-r’ requires a right PWd boundary. But both scenarios are compatible with the possibility of ‘-r’ in (24c).

The second objection concerns the concept of affixal clitics. Weak function words lack prosodic structure. Therefore, they do not take part in prosodic structure building. However, the recursion of a prosodic word boundary, to my mind, is an instance of prosodic structure building, and I wonder how this can be triggered by prosodically invisible material.

The third concern that I have is empirical. The data in (27) are not discussed by Selkirk.

- (27)
- a. I gave up the plan/*it
 - b. I gave the plan/it up
 - c. I gave the book/it to Mary
 - d. I gave Mary the book/*it

If recursion of prosodic word boundaries is possible in the case of (23), why is it impossible here? An explanation of this along Selkirk’s lines would end up in another stipulation, namely, that PWd recursion is only possible with verbs, but not with particles or nouns, although these bear the main stress in the relevant examples in (27).

What would be an alternative explanation of (23)? First of all, it might not be accidental that Selkirk’s standard examples are modal and copula verbs, and prepositions, categories which are somewhat between lexical and functional. Pronouns and determiners are much more paradigmatic instances of function words. Perhaps the possibility of shifting freely between a strong and a weak form without an information structural effect is special of prepositions, copulas and modals, due to their hybrid status.

True function words, like pronouns, determiners and temporal auxiliaries, are preferably weak, and focused, if stressed. Another striking feature of Selkirk’s analysis is that it is based on the assumption that ALIGNPPhR is inviolable in English. This might not be so, and (23) might simply be an example in case. Under this assumption, we could retain the free clitic analysis for all weak function words in English, and would not have to make use of the questionable concept of affixal clitics.

Why, then, is (23) the optimal structure? As the pronoun cannot be stressed, being a true function word, the only way to avoid a violation of ALIGNPPhR would be moving it away from the right edge. This would result in a clause with the word order in (28):

(28) *We him/'m need

But (28) is ill-formed for syntactic reasons. The relevant syntactic constraint obviously has higher priority. The formulation of such a syntactic constraint will in the end be very similar to Holmberg's generalisation: an object may not appear to the left of elements that c-command it, here, the verb. In (27), however, there are syntactic alternatives (27b,c) where the object remains behind the verb. These avoid violating ALIGNPPhR, and therefore structures (27a,d) are blocked for the weak object pronoun. Note, however, that expressions like (28) can be found with Romance clitics. One option to account for these might simply be that ALIGNPPhR is ranked higher in Romance than in the Germanic languages. The difference between Germanic weak pronouns and Romance pronominal clitics would then result from different relative rankings of prosodic and syntactic constraints rather than from differences in the functional lexicon.

To sum up, the integration of a syntactic perspective helps simplifying Selkirk's analysis and avoids some of its problematic aspects. On the other hand, we can integrate the core of Selkirk's analysis, the constraint ALIGNPPhR, into a syntactic account of object shift, for example, as a replacement of the problematic [\pm Foc] feature of Holmberg. Thus, by integrating a syntactic and a prosodic perspective, it will be possible to get rid of otherwise perhaps unavoidable problematic stipulations. This scenario furthermore allows us to generalise the analysis from object shift to other related phenomena, and other languages. The details of this account are the topic of the next section.

4 An OT model of the syntax-phonology interaction

In (Vogel 2003; 2004) and (Schmid and Vogel 2004), we propose an architecture for Optimality Theory syntax that is based on the *correspondence* of different representations. The constraint set mainly consists of constraints that regulate the correspondence of semantic, syntactic and phonological structure. Following current thinking in generative syntax (cf. Kayne 1994), linear order is assumed to be part of the surface structure only, and therefore, consequently, specified in the phonological representation *only*. I will use a simplified version of such a correspondence theoretic OT syntax grammar here. It will mainly deal with syntax-phonology correspondence, and, in this, it is very similar to the OT syntax model that has been proposed by Pesetsky (1997; 1998).

The model has syntactic structures S_I in the input and pairs of a syntactic structure S_O and a phonological structure P , [S_O, P], in the output.

(29) OT model for syntax-phonology interaction:

Input	<i>Syntactic structure</i> [S_I]
output candidates	<i>Syntactic structure, phonological structure</i> [S_O, P]

The double occurrence of syntax in input and output opens the possibility to let purely syntactic constraints still take effect, such that one syntactic structure can be blocked by another one. This will be necessary for our treatment of the English dative alternation, cf. (27c,d), and I will postpone a more detailed discussion of this feature of the model to section 8. For the present purpose, it is sufficient to

assume a simple syntax-phonology mapping. Any possible order of the words in P is an output candidate.⁷ Thus, for a given syntactic structure S, there is a set of output candidates which includes all possible linearisations of the words in S. Secondly, the same linear order can have different prosodic structures, prosodic phrasing itself being subject to optimisation.

In (Schmid and Vogel 2004), we propose constraints that regulate the mapping from syntactic structures onto such strings of words. For example, the relative ranking of the two constraints in (30) determines whether a language is an SVO- or an SOV-language. The definitions in (30) are adapted to our terminology.⁸

(30) a. **MAP(complement before head) (MAPch)**

If A and B are sister nodes at S, and A is a head and B is a complement, then the correspondent of B precedes the one of A at P.

b. **MAP(head before complement) (MAPhc)**

If A and B are sister nodes at S, and A is a head and B is a complement, then the correspondent of A precedes the one of B at P.

In order to make these constraints applicable, we need to clarify what corresponds. I will assume here that only the overt material is taken into account for S-P correspondence. In particular, only the heads of syntactic movement chains have P-correspondents.⁹ Consider the verb second clause structure in (31), a typical object shift configuration:

(31) [IP NP_i V_j [VP NEG [VP t_j NP_k]]]

The P-correspondent of VP can only be the material that corresponds to *heads of chains* within VP, i.e., the P-correspondent of NP_k. The adjoined negation NEG does not belong to the lower segment of VP, but it *does* belong to the higher segment. Truckenbrodt (1999) argues that only the lower segment of an adjunction structure counts in syntax-prosody mapping. I will follow this assumption here. However, the decision does not bear on the issue, all we need is being able to evaluate the relative order of adjuncts and their hosts.

A second question is which elements in P can correspond to elements of S. We could simply assume that all words correspond to syntactic elements. On the other hand, there are simple and complex elements in S, in particular, heads and phrases. Likewise, at P, we have words, prosodic words, phonological phrases, and intonation phrases. Truckenbrodt (1999) assumes the following “XP-to-P Mapping Condition”:

(32) *XP-to-P Mapping Condition* (Truckenbrodt 1999: 221):

Mapping constraints relate XPs to phonological phrases, but do not relate XPs to other prosodic entities.

The constraints Truckenbrodt has in mind here are first of all his mapping constraints STRESSXP and WRAPXP, which require lexical XPs to bear phrasal stress and to be contained within a single

PPh, respectively.¹⁰ His system of constraints describes to what extent the projection of phonological and intonation phrases is determined by the underlying syntactic structure. But even if prosodic word formation is not syntactically constrained, it is still important that prosodic words are constituents of phonological phrases, and correspond to the constituents of an XP. Furthermore, we might not assume that syntactic X^0 categories determine prosodic phrasing, but we have to determine which elements of P they correspond to. The S-P correspondence conventions that I assume in this paper are given in (33).

(33) S-P correspondence relations:

S	P
X^0	a lexical or function word
XP	the word that corresponds to the head of XP, X^0 , plus the prosodic words that correspond to the constituents of XP

Note that (33) does not mention phonological phrases. To establish correspondence relations, it is sufficient to assume that what corresponds to an XP is the set of words and PWds that correspond to XP's constituents. Phonological phrases, from this point of view, are genuine prosodic representations, they are only indirectly related to syntactic elements. Their construction is independent of the S-P correspondence relations, though the *evaluation* of XP-PPh mapping constraints like those proposed by Truckenbrodt (1999) crucially relies on these correspondence relations.

How can we find out whether a VP like, for instance, “[_{VP} [_{NP} John] [_{V'} [_{V⁰} loves] [_{NP} Mary]]]” is included within a single phonological phrase, as necessary if we want to check whether Truckenbrodt's (1999) WRAP-XP is fulfilled? In order to do so, we have to take the phonological structure, and figure out which of its parts correspond to the parts of the syntactic structure – independently from the level of phonological phrase! The appropriate level for this is the next level below the phonological phrase, the prosodic word. In the usual phonological phrasing for this clause, “(_{IntP} (PPh (PWd John)) (PPh (PWd loves)) (PWd Mary))”, the correspondent of VP, the set containing the three prosodic words, is split into two different phonological phrases – so VP is not mapped onto a unique PPh. Even a system that follows the convention in (32) underlyingly assumes correspondence below the PPh level. Otherwise, it would be impossible to verify whether such mapping constraints are met or not.

The P-correspondent of a syntactic head is a word. The P-correspondent of an XP contains the correspondent of its head plus the prosodic words that correspond to the constituents of XP. This assumption has an important consequence for our discussion of object shift. Consider a VP that contains only a weak pronoun in object position, and the traces of verb and subject which have left VP:

(34) [_{VP} t_{Subj} t_V [_{NP} PRO_{wk}]]

The traces do not count at all, by assumption. The weak pronoun counts as P-correspondent of its own NP. But it does not project a prosodic word, and therefore does not belong to the correspondent

of VP, according to the conventions in (33). Thus, the VP in (34) has no P-correspondent at all! Therefore, any constraint on the linear order of this VP relative to other elements is trivially fulfilled. Linearisation constraints like MAPhc do not evaluate whether there exists a correspondent, but only whether the existing correspondents are in a particular linear order. Take now the same structure with a full NP, for instance, a proper name like ‘*Marit*’:

(35) $[_{VP} t_{Subj} t_V [_{NP} Marit]]$

‘*Marit*’ is a lexical word, it has a word accent and therefore projects a prosodic word. This prosodic word now counts as correspondent of the whole VP. Thus, in this case VP *has* a P-correspondent! We will exploit this difference in our account of object shift.

For our analysis, the interaction of constraints of these two types is crucial:

- a) constraints on the linearisation of syntactic structure in the overt form
- b) well-formedness constraints on prosodic structure

Both constraint types evaluate the same representation, P. We are now able to model the syntax-phonology interaction that we observed as the interaction of syntactic and prosodic constraints on P. The only prosodic structure constraint that we need for a start is Selkirk’s (1996) ALIGNPPhR.

5 Object Shift in Danish and Swedish

Our first analysis is concerned with Danish object shift. In particular, we need to derive the pattern illustrated in (8): If the verb has undergone verb second movement, a weak object pronoun stands in front of an adverb adjoined to VP, while a full NP stands behind the adverb. If the verb remains inside VP, OS is blocked.

Let us assume, in addition to ALIGNPPhR, the linearisation constraints MAPhc and MAPch from (Schmid and Vogel 2004), and the one in (36), and the ranking in (37):¹¹

(36) ADJUNCTLEFT (ADJL):

If A is adjoined to B at S, then the correspondent of A precedes the correspondent of B at P.

(37) MAPhc >> ADJL >> ALIGNPPhR >> MAPch

The high rank of MAPhc ensures that the relative order of head and complement is immune to prosodic triggers for reordering. MAPch is ranked lowest and will play no role. It will be omitted throughout. ADJL now evaluates in our example the relative order of the negation and the VP it is adjoined to. If the VP contains only a weak pronoun, it has no correspondent and ADJL is trivially

fulfilled by any candidate. Thus, that constraint cannot decide among two rival candidates and the next lower constraint comes into play, ALIGNPPhR.

(38) Weak pronoun OS in Danish:

[... [VP NEG [VP t _V PRO _{wk}]]]	MAPhc	ADJL	ALIGNPPhR
☞ ... <i>pro neg</i>			
... <i>neg pro</i>			*!

If the object is a full NP, the VP has a correspondent, and ADJL is crucially violated by the OS candidate, but there is no prosodic trigger for OS here anyway:

(39) Prohibition of full NP OS in mainland Scandinavian:

[... [VP NEG [VP t _V NP]]]	MAPhc	ADJL	ALIGNPPhR
... <i>noun neg</i>		*!	
☞ ... <i>neg noun</i>			

If the verb remains in situ, a violation of ALIGNPPhR is tolerated in order to fulfil the syntactic linearisation constraints.

(40) Prohibition of OS with V in situ in mainland Scandinavian:

[... [VP NEG [VP V PRO _{wk}]]]	MAPhc	ADJL	ALIGNPPhR
a. ... <i>neg pro V</i>	*!		
☞ b. ... <i>neg V pro</i>			*
c. ... <i>V pro neg</i>		*!	

Candidate (40a) violates MAPhc because the pronoun still counts as correspondent of NP and MAPhc requires V to precede NP. Candidate (40c) is also a possible repair, but it violates ADJL. Note that this tableau shows that ranking ALIGNPPhR below the other two constraints is crucial. For the relative ranking of MAPhc and ADJL we in fact do not have crucial data. However, some observations about Swedish adverbs suggest that right-adjunction is possible, and that this constraint therefore might have lower priority:

(41) Adverbs on the right in Swedish (Broekhuis 2001):

- a. Han tvättar gärna bilen
he washes with-pleasure the-car
- b. Han tvättar bilen gärna

(42) a. Han tvättar ju/inte bilen
he washes indeed/not the-car

- b. *Han tvättar bilen ju/inte

The contrast between (41) and (42) shows that this phenomenon is dependent on adverb type. The negation is very frequently used to test for object shift, because it may not occur to the right of VP.

OS is also blocked for full NP objects and if the verb remains inside VP. However, we saw in the Swedish examples in (10), repeated in (43), that all other material within VP also blocks OS of weak pronouns, if it precedes them:

- (43) Swedish, OS blocked (= 10):
- a. *Jag talade henne_i inte med t_i
I spoke her not with
- b. *Jag gav den_i inte Elsa t_i
I gave it not Elsa
- c. *Dom kastade mej_i inte ut t_i
They threw me not out
- (Holmberg 1986; Sells 2001: 47f)

Example (43a) is already covered by the constraint set we have thus far, in particular, MAPhc also applies to prepositional phrases and prevents that the pronoun occurs left to the preposition. The same holds for (43c) under a head analysis for the particle. Sells (2001), for instance, argues that the particle is right-adjoined to the verb, and thus part of the verbal head, in Swedish particle verb constructions.

Example (43b) requires a constraint that evaluates the relative order of the two object NPs. Let us assume that the NP '*Elsa*' asymmetrically c-commands the NP '*den*' in abstract syntax. Then a constraint that evaluates the relative order of NPs is sufficient here:

- (44) MAP(NP):
If A asymmetrically c-commands B at S, and A and B are NPs, then the correspondent of A precedes the correspondent of B at P.

This constraint must be ranked higher than ALIGNPPhR, perhaps on a par with MAPhc:

- (45) MAP(NP) MAPhc >> ADJL >> ALIGNPPh

6 OS from non-final position

Swedish particle verbs like the one illustrated in (43c) are exceptional among mainland Scandinavian in that the particle precedes the object. Danish particle verbs have the object in front of the particle. Interestingly, weak object pronouns with particle verbs here again have to shift:

- (46) Danish:
- a. Jeg skrev det/DET ned /*ned det/DET
I wrote it /IT down /*down it /IT
 - b. Jeg skrev det ikke ned
I wrote it not down
 - c. Jeg skrev ikke *det/DET ned
- (Ken Ramshøy Christensen, p.c.; cf. Holmberg 1999: 2)

The problem posed by the contrast in (46b,c) is: Why does the weak pronoun in (46c) have to stand in front of the negation, although it would not occupy a final position otherwise?

What would be the prosodic structure of (46c) with the weak pronoun? Adverbs typically project not only prosodic words, but also their own phonological phrase. Let us assume this for the negation in this example. The particle ‘*ned*’ bears a word accent, it projects a prosodic word and heads its own phonological phrase, too, because it is to the right of the adverb’s PPh. It heads the final phonological phrase which also functions as head of the intonation phrase. For the weak pronoun, we have three possibilities: it may integrate into the PPh of the negation or the PPh of the particle, or it may project its own PPh:

- (47) Possible phrasings of (46c) with weak pronoun:
- a. ((*ikke*)_{PWd})_{PPh} (*det*)_{PPh} ((*ned*)_{PWd})_{PPh}
 - b. ((*ikke*)_{PWd} *det*)_{PPh} ((*ned*)_{PWd})_{PPh}
 - c. ((*ikke*)_{PWd})_{PPh} (*det* (*ned*)_{PWd})_{PPh}

Neither of these options is obviously possible. How can this be derived? (47a) is excluded for principal reasons: ‘*det*’ lacks word stress and cannot project prosodic structure. (47b) violates Selkirk’s (1996) ALIGNPPhR which bans weak function words from the right edge of phonological phrases. In (47c), ‘*det*’ occurs at the left edge of the final PPh. This is obviously also bad, but it is not accounted for yet.

In Selkirk’s system, the edges of prosodic layers are subject to a whole family of alignment constraints. There is no intrinsic reason, why the right edge should be more important than the left edge. Thus, it is very reasonable that ALIGNPPh comes in two versions, one for the left edge and one for the right edge:¹²

- (48) Phonological phrase alignment (Selkirk 1996):
- a. Align(PPh, R; PWd, R) (= ALIGNPPhR)
 - b. Align(PPh, L; PWd, L) (= ALIGNPPhL)

Why is (46b) preferred? The prosodic structure of this clause is presumably the one in (49):

(49) $(j\text{eg } (skrev)_{PWd})_{PPh} (det \text{ } (ikke)_{PWd})_{PPh} ((ned)_{PWd})_{PPh}$

It seems, thus, that a violation of ALIGNPPhL in a non-final PPh is less problematic than in the final PPh. Recall that the final PPh is more prominent than the pre-final one, as it is the head of the intonation phrase. This asymmetry can be used for the formulation of two additional constraints that require edge alignment for PPhs which serve as heads, let us call them ALIGNPPhL_{hd} and ALIGNPPhR_{hd}. The data just discussed suggest the following ranking for Danish and Swedish:

(50) ALIGNPPhR ALIGNPPhR_{hd} >> ALIGNPPhL_{hd} >> ALIGNPPhL

This ranking now makes the correct prediction:¹³

(51) OS from non-final position with particle verbs:

[... [VP NEG [VP t _V det ned]]]	ALIGN PPhR	ALIGN PPhR _{hd}	ALIGN PPhL _{hd}	ALIGN PPhL
a. $(ikke)_{PPh} (det \text{ } ned)_{PPh}$			*!	*
b. $(ikke \text{ } det)_{PPh} (ned)_{PPh}$		*!		
c. $(ikke)_{PPh} (det)_{PPh} (ned)_{PPh}$		*!		*
d. $(ikke)_{PPh} (ned \text{ } det)_{PPh}$	*!	*		
e. $(det \text{ } ikke)_{PPh} (ned)_{PPh}$				*

This explains (46b) as an effect of prosodic well-formedness constraints. Though such a strategy is possible in principle, one might wonder whether it is suitable for Danish. The ideal position for weak function words, according to this system of constraints, is between two prosodic words, avoiding the occurrence at either edge of a PPh. But prosodic phrasing is variable. It can be influenced by focus and lexical factors. We might, therefore, expect exceptions to this linearisation pattern in cases that have a different prosodic phrasing, for instance where adverb and particle are contained within a single PPh. In Swedish, for instance, it is possible that the weak pronoun can “intermingle” within a sequence of adverbs (see section 7.3).

In Danish, however, this is reported not to hold. Weak pronouns have to precede all adverbs in the OS context. The phenomenon is thus more robust and therefore has more the appeal of being syntactically triggered. An alternative explanation of (46b) in terms of syntactic linearisation is possible which exploits our guiding insight that weak pronouns do not take part in prosodic structure building. The constraints on linear order might not be restricted to requirements on the relative order of elements, but they might also require *adjacency* of elements of P.¹⁴ Let us assume such a constraint for an adjunct and its host:

(52) ADJADJ:

If A is adjoined to B at S, then the correspondents of A and B are adjacent at P.

This constraint has an interesting effect for our case of Danish particle verbs. The underlying syntactic structure for example (46b) is (53):

(53) [IP jeg skrev [VP ikke [VP t_V det ned]]]

The correspondent of the adjunct is the prosodic word ‘ikke’. The correspondent of the VP is only the prosodic word ‘ned’, the pronoun ‘det’ does not count. In order to have the two correspondents, the prosodic words, adjacent, the pronoun has to “move” out of the way. It may not move rightwards, because of Selkirk’s (1996) ALIGNPPHR, so it moves leftwards. The tableau in (54) shows how this result is achieved, with ADJADJ and ADJL ranked on a par.

(54)

[VP ikke [VP t _V det ned]]	ADJL ADJADJ	ALIGNPPHR
a. <i>ikke det ned</i>	*!	
b. <i>ikke ned det</i>		*!
c. <i>det ned ikke</i>	*!	
☞ d. <i>det ikke ned</i>		

Which of the two solutions is correct, is an empirical matter, and requires examination of a larger body of data than we can consider here. So I will leave this issue open. But, as already suggested, if the Danish facts turn out to be as robust as it seems, then this second solution is much more plausible. The first solution, in terms of prosodic well-formedness, might nevertheless be the correct one for languages that show a more flexible placement of weak function words, as it seems to be the case in Swedish, to which we will turn in section 7.

Both approaches can account for other cases of clause-internal weak pronoun shift, as in the examples of weak subject pronouns in German and Swedish:

(55) German subject pronouns (= 5):

- a. Heute wird *bestimmt es regnen/ es bestimmt regnen
 today will certainly it rain/ it certainly rain
- b. Dann hat *wohl er / er wohl gelogen
 then has *seemingly he / he seemingly lied

(56) Swedish subject pronouns (= 6):

- Igår tog *inte han / han inte med sig sina pengar
 yesterday carried *not he / he not with SELF his money

The explanation follows the same logic as before. In order to have the adverb and its host adjacent, to fulfil S-P mapping, the pronoun has to “go out of the way”. Alternatively, in terms of prosodic well-formedness, ‘*er*’, ‘*es*’ and ‘*han*’ have to leave the final phonological phrase and align with the left edge of the penultimate PPh to improve prosodic phrasing.

7 Swedish pronouns

Swedish seems to be much more liberal than Danish. While a weak object pronoun may remain in clause-final position, i.e., OS is only optional, the pronoun may also undergo “long object shift” across the subject, and occupy positions within a cluster of adverbs. Neither of these options is reported to be possible in Danish. However, it seems that there is a lot of dialectal variation in Swedish.

7.1 Optionality of OS in Swedish

With respect to the problem of optionality, recent observations reported by Josefsson (2003) suggest that the analysis presented here is on the right track. She made a survey on the acceptability of shifted and non-shifted structures with weak pronouns among 29 Swedish native speakers. Speakers could give gradient judgements ranging from “OK”=4 points to “*”=0 points.

Josefsson did not report the exact figures of her survey. Her diagram only allows a guess for the approximated value which I present in (57):

- (57)
- a. Mannen såg inte den \approx 3.0
man.the saw not it
 - b. Mannen såg den inte \approx 3.8
 - c. Jag gillar inte honom \approx 3.5
I like not him
 - d. Jag gillar honom inte \approx 3.8

The unshifted version with the pronoun ‘*den*’ is obviously less acceptable than the shifted version and the unshifted version with ‘*honom*’. Between the two versions with ‘*honom*’, the difference is rather small. Josefsson suggests that

[...] the different opinions with regard to individual sentences seem to depend, at least partly, on the syllabic structure of the pronoun, perhaps also on other factors. [...]

One difference between the two pronouns is that ‘*den*’ is monosyllabic while ‘*honom*’ is disyllabic. For Selkirk’s (1996) account, it is crucial that the function words she deals with are monosyllabic. Disyllabic words usually have at least word stress. This might make it easier for disyllabic function words to project prosodic words, and allow them to occur clause-finally.

The pronunciation of function words is subject to much dialectal variation, and if this factor is crucial for object shift, we expect differences among dialects with respect to the possibility and

optionality of OS quite frequently. That this is indeed the case has repeatedly been reported in the literature.

7.2 Long object shift

Typical examples of long object shift in Swedish – the only Scandinavian language that is proposed to have it – are given in (58) :

- (58) Long object shift (Josefsson 2003):
- a. I hallen mötte honom en hemsk syn
in hall.the met him a horrible view
“In the hall he met a terrible sight.”
 - b. I det ögonblicket slog henne en skrämmande tanke
in that moment hit her a terrifying thought
“In that moment she was struck by a terrifying thought.”

Josefsson (2003) notes that long OS is a challenge for Holmberg’s generalisation. It assumes, in the version proposed by Holmberg (1999), that an adverb is “invisible” in the sense that it does not block object shift. However, as other arguments, the verb, a particle or a preposition block OS, it is assumed that adverbs are exceptional in this. That an object may move in front of a subject is totally unexpected.

According to Josefsson, certain conditions must be met for long OS to apply. Animacy of the pronoun is one crucial factor. In (58), we have an animate object pronoun and an inanimate subject. Other examples of long OS given in the literature suggest that person might also be a factor:

- (59)
- a. Darför ger mig Tutanchamons hemiska förbannelse ingen ro
therefore gives me Tutankhamen’s terrible curse no peace
“Therefore Tutankhamen’s terrible curse gives me no peace.”
 - b. Varför hjälper mig Helge ikke
Why helps me Helge not
“Why doesn’t Helge help me? ”
 - c. *Varför hjälper mig du ikke
Why help me you not
“Why don’t you help me? ”
- (Josefsson 1992)

A first person object pronoun may occur in front of a third person subject, even an animate one, but not in front of a second person pronominal subject. Prominence scales like the person scale (1st, 2nd < 3rd) and the animacy scale (animate < inanimate) figure prominently in recent typological work in Optimality Theory, starting with Aissen (1999) who shows how such functional scales guide

phenomena like ergative split and the choice of passive voice. A third factor that might be relevant is the complexity of the subject NP. The examples in (58) as well as (59a) have quite complex NPs as subjects. That lighter NPs precede heavier NPs is a general tendency which is well-known from word order regularities in the middle field of the German clause, as well as from English Heavy NP shift (cf. Vogel and Steinbach 1998 and Müller 1999 for brief discussions of the German facts, and Wasow 2002 for a detailed analysis of the influence of this factor in English).

A cumulation of these factors obviously makes long OS across the subject more likely. Without going into detail, an OT account should be capable of modelling this, along the lines of Aissen (1999) and Müller (1999), and it should be possible to integrate this with what we have thus far. However, as long OS is an optional process, the empirical reality of this operation needs to be clarified first. Which are the conditions under which it applies, is it the unmarked option, when it is grammatical, and how frequent is it? A more detailed exploration of these issues goes beyond the scope of this paper.

7.3 Adverbial intermingling

Swedish is also exceptional in allowing weak pronouns to occur within a sequence of adverbs. This is called “adverbial intermingling”. The weak pronoun may occur in each of the indicated positions in Swedish:

- (60) Igår läste han (dem) ju (dem) alltså (dem) troligen (dem) inte (dem)
 yesterday read he them indeed thus probably not
 (Hellan and Platzack 1995: 56)

Danish requires the pronoun to precede all adverbs. This can be attributed to the constraint ADJADJ in our system. Each adverbial adjunct is part of the host of the next higher adjunct. In order to yield adjacency of host and adjunct, the pronoun has to “move” out of the way, to the left of the adverbial cluster. This will lead to a violation of ALIGNPPH_L, however. For Swedish, the syntactic account might be too strict. According to prosodic well-formedness, having a weak pronoun between two adverbs is advantageous in those cases, where the adverbs do not all project phonological phrases:

- (61) ((adverb₁)_{PWD} pronoun (adverb₂)_{PWD})_{PPH}

The pronoun does not align with an edge of a PPh here, and so no violation of the PPh alignment constraints is incurred. Especially those adverbs which are prosodically rather weak, like ‘*ju*’ might be candidates for such structures. If this analysis is on the right track, the two alternative explanations for OS from non-final positions might both have their own empirical scope, and whether a language follows the syntactic or the prosodic route might itself be subject to inter-Scandinavian variation. Again, we also expect much inter-speaker and dialectal variation.

7.4 OS across the particle

Another interesting paradigm has first been discussed by Vinka (1999). Swedish particle verbs differ in the predicative status of the particle. Predicative particles are those which have a transparent contribution to the meaning of the clause, i.e., in (62), when the TV is turned on, we can say that the TV *is on*. Other verbs with a non-predicative particle, like ‘*ner*’ in (63), do not allow OS across the particle.

(62) OS across a predicative particle in Swedish:

- a. Kalle satte på den
Kalle sat on it
‘Kalle switched it on’
 - b. Kalle satte den på
 - c. *Kalle satte TVn på
- (Vinka 1999)

(63) No OS across a non-predicative particle in Swedish:

- a. Kalle smutsade ner den
Kalle dirtied down it
 - b. *Kalle smutsade den ner
- (Vinka 1999)

The paradigm in (62) shows the characteristics of Swedish object shift, a full NP may not shift, while a weak pronoun may shift. Predicative particles are no intervenors in the sense of Holmberg’s generalisation, while non-predicative ones are. Thus, a different syntactic analysis of the two is indicated. Let us assume that non-predicative particles are adjuncts to V^0 , while predicative particles are predicates in a small clause structure:

(64) a. Predicative particles:

[_{VP} V [_{SC} Prt NP]]

b. Non-predicative particles:

[_{VP} [_{V°} V Prt] NP]

Thus, non-predicative particles count as correspondents of V at P, and the relative order of particle and NP is therefore subject to the highly ranked constraint MAPhc. Small clauses, on the other hand, have a special syntactic status, and need their own linearisation constraint, call it MAPsc:

(65) MAPsc:

If A is the predicate of a small clause at S, and B its subject, then the correspondent of A precedes the correspondent of B at P.

The optionality of OS with a predicative particle verb now follows if MAPsc and ALIGNPPhR are tied.¹⁵ Having the pronoun in final position leads to a violation of ALIGNPPhR, while the pronoun in front of the particle violates MAPsc. A full NP in final position does not violate ALIGNPPhR, this order also satisfies MAPsc, and so the order ‘full NP – particle’ is blocked.

8 English object shift

The examples in (66) show that English avoids clause-final weak pronouns, too, when this is possible:

- (66) English weak pronoun shift (=3):
- a. I gave up the plan/*it
 - b. I gave the plan/it up
 - c. I gave the book/it to Mary
 - d. I gave Mary the book/*it

The dative alternation in (66c,d) is a syntactic alternation. I briefly mentioned above in section 4 that for capturing such alternations, the OT concept of faithfulness is quite useful. The idea is, roughly, that a particular syntactic structure that we want to express, i.e., that we have specified in the input, is *neutralised* to another closely related structure due to markedness. Faithfulness constraints ensure that the winning structure differs minimally from the input (see, for instance, Baković and Keer 2001, and Vogel 2004 for OT accounts of optionality and ineffability based on faithfulness).

Hence, we have two different competitions for the two ditransitive structures in (66c,d), the double object construction (DOC) and the *to*-dative construction (*to*-DC). They differ in whether the input specifies for the DOC or the *to*-DC. In each of these two competitions, the two structures compete as candidates. The input-faithful structure usually wins, unless it is ruled out by a higher ranked markedness constraint. Hence, both structures win the competition where they conform to the input in the versions of (66c,d) with the full NP ‘*the book*’ as theme argument. With the weak pronoun ‘*it*’, however, the double object construction violates the higher ranked prosodic constraint ALIGNPPhR, which has the effect that the unfaithful *to*-DC wins the competition for the DOC, in addition to the competition for the *to*-DC.

In parallel to the ditransitive case, the particle verb alternation can also be treated as an instance of a syntactic alternation. (66a), where verb and particle are adjacent, has both words together under the V⁰ node. In (66b), the particle heads its own projection with the object NP in its specifier position.¹⁶

Let us assume a general syntactic faithfulness constraint, FAITH-SYN. It is ranked below ALIGNPPhR. Both are ranked below MAPhc, however, so in an ordinary transitive clause the pronoun has to stand behind the verb even if this means being in PPh-final position. But as long as both candidates fulfil MAPhc, as in our examples in (66), ALIGNPPhR is decisive.

(67)

[_{IP} She [_{VP} saw it]]	MAPhc	ALIGNPPhR	FAITH-SYN
☞ <i>She saw it</i>		*	
<i>She it saw</i>	*!		
[_{IP} I [_{VP} gave [_{NP} Mary] [_{NP} it]]]			
[_{IP} I [_{VP} gave [_{NP} Mary] [_{NP} it]]]		*!	
☞ [_{IP} I [_{VP} gave [_{NP} it] [_{PP} to Mary]]]			*
[_{IP} She [_{VP} gave up it]]			
[_{IP} <i>She</i> [_{VP} gave up it]]		*!	
☞ [_{IP} <i>She</i> [_{VP} gave [_{PTP} it up]]]			*

9 Conclusion

A prosodic account offers a new perspective on Scandinavian weak pronoun object shift. It assumes that the phenomenon is due to a prosodic restriction which is quite common among the Germanic languages and among different kinds of function words. A purely phonological account fails as long as it lacks an integration of the syntactic factors that restrict object shift. The OT model developed in this paper integrates syntactic and prosodic constraints as *constraints on the linear order* of elements which interact at a level playing field.

The most important assumption that has been made here is that weak function words are partly ‘invisible’ – they do not count as part of the P-correspondent of a verb phrase. This is due to their inability to project prosodic structure. Therefore, a shifted weak pronoun does not violate syntactic constraints on the linearisation of VP. On the contrary, adjacency conditions even require weak pronouns to “move” out of the way under particular circumstances.

This view of the phenomenon sharply contrasts with previous analyses of object shift like the one by Holmberg (1999). For Holmberg, an adverb is ‘invisible’ in the sense that it does not block object shift, unlike verbs, particles, predicates and arguments. The trigger for OS, according to Holmberg, is a feature [\pm Foc], the content of which is not very clear.

I argued here that it is the other way around. From the perspective of prosody, it is the adverb which is ‘visible’, and the pronoun which seems to disappear. The pronoun’s deficient prosody has two effects. One is the trigger for object shift, it tends to be avoided at the right (and left) edge of a phonological phrase. Secondly, as mentioned above, it is unable to be the correspondent of syntactic phrases other than its own NP at the surface representation P. For a VP containing a weak pronoun, it is as if the pronoun was not there at all. Therefore, a VP-adverb can change its place with a pronoun without even violating the syntactic constraint on the linearisation of adjuncts.

The major advantage of this approach is its empirical adequacy and coverage: it focuses on the prosodic weakness of the pronoun as the driving force behind object shift, and generalises to related phenomena with different function words and in different Germanic languages. The general pattern that we find in all these cases can be schematised as follows:

(68) Important syntactic constraints >> prosodic well-formedness >> minor syntactic constraints

Similar optimality theoretic analyses of other phenomena in the domain of syntax-phonology interaction have been developed by Samek-Lodovici (to appear), Büring (2001), Szendrői (2001), and many others. Such an interaction, the interleaving of prosodic and syntactic well-formedness constraints, is presumably much easier to model within Optimality Theory than in most other formal frameworks. Thus, the offered analysis is also another argument in favour of the Optimality Theoretic view on grammar.

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¹ Capital letters in (1a) and throughout the paper signal contrastive stress on the capitalised words.

² One anonymous reviewer remarks that adverb-subject order in (5c) requires stress on the subject. I do not agree with this. “Dann hat wohl Peter gelogen” is best with focus on the subject, but it can be uttered with main stress on the clause-final verbal participle, though this is not the default word order for such a stress pattern. With the weak unstressed pronoun “er” in place of “Peter”, however, the same clause with the same stress pattern sounds very odd.

³ Many of the Swedish examples have first been introduced by Holmberg (1986). Sells (2001) gives an excellent overview of the discussion since that seminal work, and documents most of the Swedish OS facts that have been reported and discussed in the meantime.

⁴ An incomplete list includes Chomsky (1993), Vikner (1994), Holmberg and Platzack (1995), Bobaljik (1995, 2002), Broekhuis (2001).

⁵ While the second step in this derivation seems to be without alternative, the first step can be analysed differently, and in a way that is more compatible with standard minimalist assumptions. This analysis is based on the copy theory of movement and exploits the idea that parts of a moved complex constituent can be spelled out in different places. Such an analysis has been proposed by Fanselow and Çavar (2001; 2002) for “split topicalisation” of complex noun phrases in German and other languages which is triggered by an information structural split within the constituent. (13a,c) can be analysed as VP-fronting where only the focused verb is spelled out in the higher position, while the unfocused object, though also moved as part of VP, is spelled out in the base position.

⁶ There is, of course, a correlation between being unstressed and being “discourse-old”. These usually go hand in hand. The trigger for full NP OS in Icelandic could as well be prosodic, e.g., there could be a strong preference for having the phrase that bears the clausal main stress at the right edge in Icelandic. If the object does not itself bear main stress, it would therefore be preferred to occur in non-final position. Specific indefinites are typically “presuppositional”, i.e., referring to a previously introduced set, and therefore have to be unstressed. Non-specific indefinites are typically new information and therefore usually stressed. They typically bear main stress in a transitive clause. Looked at it from this perspective, there might still be the possibility for a unified account of OS in Scandinavian. A full exploration of this avenue lies beyond the scope of this paper, however.

⁷ It needs to be clarified whether the different linearisations are derived in the way syntactic structures are, i.e., whether I assume “PF movement”. This assumption would entail that some linear orders are privileged over others, as the basis for “PF movement” steps. But any such “privilege” is formulated in the form of S-P mapping constraints in the present system. Consequently, all linearisations are of the same status. The generator function for the linear orders is simply a mapping function that takes the set of words in P as input and the set of all possible sequences of these words as output, the (linearisation part of the P-part of the) candidate set.

⁸ For further applications of this model, for instance, a systematic account of the typology of basic word orders, and minimality effects in English and German, see (Vogel 2003; 2004).

⁹ Note that an account of resumptive elements as “spelled out” traces along the lines of Pesetsky (1997; 1998) requires traces to be allowed to have P-correspondents, too. The model used here is a simplification in this respect. However, we would only need to rank Pesetsky’s constraint “Silent trace” higher than the other constraints used here to get the results right, and still integrate Pesetsky’s OT account of resumption.

¹⁰ Truckenbrodt shows, in line with earlier work, that only lexical categories are relevant for syntax-

prosody mapping. His constraints are therefore applied to lexical XPs only.

¹¹Linearisation constraints like HEADLEFT, HEADRIGHT, COMPLEMENTLEFT etc. are familiar from Jane Grimshaw's work in OT syntax (cf. Grimshaw 1997, a.o.). In Grimshaw's version of OT syntax, linearisation is defined on syntactic trees. But apart from this, the constraint system is to a large extent equivalent to ours. Zepter (2003) presents a more recent detailed application of Grimshaw's system in accounting for the typology of basic word order patterns.

¹² Independent evidence for ALIGNPPhL comes from the observation that clause-initial weak pronouns in German (and also Dutch, cf. Zwart 1991;1994; Gärtner and Steinbach 2000) are only possible if they are subjects or expletives:

- (i) a. Es wurde gekauft – it(subj./expl.) was bought
- b. *Es kaufe ich – it(obj.) buy I

This instance of syntax-phonology interaction is similar to the examples discussed in this paper: a violation of prosodic well-formedness is legitimate (ia) if the repair would lead to a syntactically marked configuration (here, presumably, due to violating a constraint that requires subjects to precede objects). But if the structure is syntactically marked already, as in (ib), this advantage disappears, and prosodic well-formedness takes effect. A marked syntactic configuration is possible within the limits of prosodic well-formedness only, while a prosodically marked structure is tolerated in favour of syntactic well-formedness.

¹³Note that candidate (51c), where a weak pronoun has its own PPh, is excluded independent of the constraint ranking. The candidates (b.) and (e.) have one violation less than (c.). Candidate (c.) is thus "harmonically bounded". It is, however, questionable whether such candidates, PPhs containing no PWD, could even exist. So (51c) might not even be generated.

¹⁴ This is reasonable especially in the case of adverb adjunction discussed here. Adverbs are usually not assumed to be moved into the syntactic position where they occur. The heuristic principle that is applied by syntacticians to determine an adverb's adjunction site is adjacency: adverbs are adjoined to a constituent to which they are adjacent at the surface. So (52) simply encodes common practice as an OT constraint.

¹⁵I assume a global constraint tie here, which means that there are two co-grammars which differ in the relative rank of the two tied constraints. I.e., in one grammar MAPsc is higher, preferring 'particle pronoun' order, and in the other ALIGNPPhR is higher, favouring 'pronoun particle' order.

¹⁶ Alternatively, one could assume an entirely prosodic account of English particle verbs: the particle and the object always form their own maximal projection, ALIGNPPhR governs the order of particle and weak pronoun, and additional prosodic constraints require the prosodic word that serves as head of the PPh at the right edge. In a different account of the restriction on weak pronouns to the right of the particle, Dehe (to appear) uses constraints on clitic placement introduced by Legendre (2000) and Anderson (2000). The problem with these constraints (EDGEMOST, requiring clitics to be close to an edge, and NONINITIAL, banning clitics from first position) is that they simply restate observational facts, but do not offer an explanation of these observations. The account presented here has the advantage that it takes into consideration why weak pronouns behave the way they do.