

Scandinavian Verb Particle Constructions and the Intonational Properties*

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Abstract

In this paper, I discuss Scandinavian verb particle constructions from the perspective of the intonational properties of the Scandinavian languages. I show with experimental data that the final pitch peak occurs on the main verb in East Swedish and Övdalian, in which object pronouns cannot move across a particle, whereas it occurs on the sentence-final particle in East Norwegian and East Danish, in which object pronouns move across a particle. The grammatical word order of verb particle constructions conforms to the basic pitch pattern of the main verb in each respective language, i.e. a HL contour in East Swedish, a LHLH(L) contour in Övdalian, a HLH contour in East Norwegian and a LH contour in East Danish. Those basic pitch patterns correlate with the absence of Object Shift in East Swedish and Övdalian on one hand, and its presence in East Norwegian and East Danish on the other.

1. Introduction

In almost all the Scandinavian languages, a weak, unstressed object pronoun moves across a sentential adverb. This movement phenomenon is called *Object Shift* OS.¹ Specifically, a full NP object does not move in the unmarked case (1a), whereas a weak pronominal object moves across the negation (1b).² OS is obligatory in some of the Scandinavian varieties, but optional in others. In Övdalian, the Älvdalen dialect of Swedish, OS never occurs (Hellan and

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¹ In this work, the term *Object Shift* is used to refer to pronominal shift only.

² ‘OK,’ indicates that the relevant sentential element can be located in that position. ‘*’ indicates that the relevant one cannot be located there.

Platzack 1999, Garbacz 2009). The weak pronominal object *åna* ‘it’ always follows the negation (1c).^{3,4}

- (1) a. Jag kysste (*Marit) inte (^{OK}Marit). [Swe.]
 I kissed Marit not Marit
 ‘I didn’t kiss Marit.’
- b. Jag kysste (^{OK}henne) inte (^{OK}henne). [Swe.]
 I kissed her not her
 ‘I didn’t kiss her.’
- c. Ig tjiöpt (*åna) it (^{OK}åna). [Övd.]
 I bought it not it
 ‘I didn’t buy it.’

Despite the fact that object pronouns can move across a sentential adverb in most of the Scandinavian languages as illustrated in (1b), there are parametric differences between the Scandinavian languages with regard to the word order of verb particle constructions. Object pronouns must precede the particle in Danish (2a) and Norwegian (2b), whereas the former always follows the latter in Swedish (2c) and Övdalian (2d).^{5,6}

³ This fact was first pointed out by Levander (1909:124): ‘[n]egationen *inte* sättes alltid före objektet’ (‘the negation *inte* is always placed before the object’) (The translation is by the author).

⁴ OS has long been one of the most controversial issues in generative syntax. OS seems to be the only known movement phenomenon that is dependent on the movement of another sentential element (*Holmberg’s Generalization*, Holmberg 1986). Specifically, when a main verb moves to the second position, an object pronoun can move too: e.g. *jag kysste henne inte* [_{VP} *kysste henne*]. When a main verb does not move, an object pronoun cannot move either: e.g. **jag har henne inte* [_{VP} *kysst henne*]. See e.g. Diesing (1992, 1997), Holmberg and Platzack (1995), Bobaljik and Jonas (1996), Collins and Thráinsson (1996), Holmberg (1999), Chomsky (2001), Sells (2001), Vikner (2001), Josefsson (2003, 2010), Fox and Pesetsky (2005), Erteschik-Shir (2005a,b), Richards (2006), Broekhuis (2008), Mikkelsen (2011), Engels and Vikner (2013, 2014), among others.

⁵ In this paper, I discuss only Mainland Scandinavian, i.e. Swedish, Norwegian and Danish, and do not discuss Insular Scandinavian, i.e. Icelandic and Faroese. See Svenonius (1996) for thorough data on Scandinavian verb particle constructions including Insular Scandinavian.

- (2) a. Jeg skrev (^{OK}det) op (*det). [Dan.]
 b. Jeg skrev (^{OK}det) opp (*det). [Nor.]
 c. Jag skrev (*det) upp (^{OK}det). [Swe.]
 I wrote (it) up (it)
 ‘I wrote it down.’
 (Holmberg 1999:2,(3a-c))
 d. Å ar aingt (*eð) upp (^{OK}eð). [Övd.]
 she has hung (it) up (it)
 ‘She has hung it up.’
 (Garbacz 2009:84,(10c))

In this paper, I discuss Scandinavian verb particle constructions from the perspective of the intonational properties of the Scandinavian languages. I show with experimental data that the pitch peak occurs on the main verb in East Swedish and Övdalian, whereas it occurs on the sentence-final particle in East Norwegian and East Danish.⁷ In each of the Scandinavian languages, the grammatical word order of verb particle constructions conforms to the basic pitch pattern of the main verb, i.e. a HL contour in East Swedish, a LHLH(L) contour in Övdalian, a HLH contour in East Norwegian and a LH contour in East Danish. Those basic pitch patterns correlate with the absence of OS in Swedish and Övdalian on one hand, and its presence in Danish and Norwegian on the other.

This paper is organized as follows. Section 2 introduces previous proposals on the derivational mechanism of OS. Contra Chomsky (2001), I argue that the semantic effects on object pronouns are irrelevant to the presence or absence of OS. I also argue that a purely syntactic account by Fox and

⁶ Johan Brandtler (p.c.) addresses the question whether pronominal movement in verb particle constructions is actually a kind of OS. I assume here, following the literature (e.g. Engels and Vikner 2013, 2014), that an object is base-generated to the right of a particle in verb particle constructions, thus that pronominal movement in verb particle constructions is a kind of OS.

⁷ Hereafter, notations such as *East Swedish* are used like a proper noun that refers to a Scandinavian variety.

Pesetsky (2005) cannot provide a coherent account for parametric differences in the Scandinavian verb particle constructions. Section 3 introduces the intonational properties of East Swedish, Övdalian, East Norwegian and East Danish in turn. Section 4 presents experimental data on the Scandinavian verb particle constructions. The data shows that the pitch peak occurs on the main verb in East Swedish and Övdalian, whereas it occurs on the sentence-final particle in East Norwegian and East Danish. Section 5 discusses the intonational properties of the Scandinavian verb particle constructions, where the grammatical word order of verb particle constructions conforms to the basic pitch pattern of the main verb in each of the Scandinavian languages. Section 6 briefly concludes this paper.

2. Scandinavian verb particle constructions and the derivational mechanism

Most of the accounts of OS in generative syntax are based on the *Mapping Hypothesis* (Diesing 1992, 1997). According to this hypothesis, arguments interpreted as non-specific, new to the discourse and/or focused remain in their original positions, whereas those interpreted as specific, old information and/or defocused must move to a higher position. According to this hypothesis, object pronouns which are old information/defocused must move out of VP.

Following this hypothesis, Chomsky (2001) proposes an account of OS within the *phase* theory (Chomsky 2000). Syntactic derivations proceed by *Merge*, an operation that takes two syntactic objects (either lexical items or phrases) and combines them. A phase is a domain in which a series of such syntactic operations are conducted. v^* (a functional head that specifies the category of a transitive verb) and *C* are assumed to be phasal heads. A phase in which a series of required syntactic operations have been completed is sent to

the phonological component and is no longer accessed by further syntactic operations. This derivational point is called *Spell-Out* (S-O). At the S-O of a phase, the complement of a phasal head is spelled out by assumption. Specifically, when v*P and CP are spelled out, the complement of v* and that of C, i.e. VP and TP, are sent to the phonological component, and they are no longer accessible to any further syntactic operation. The *EPP* ('Extended Projection Principle'), the condition that a functional head requires an overt category in its Spec (especially referring to the requirement of a sentential subject, Chomsky 1981, 1986, 1995), is now formulated as the feature that triggers movement in general. A phasal head can have an EPP feature and raise an argument to its Spec when a new semantic effect is produced on the argument.⁸

According to Holmberg (1999), OS is blocked not only when a main verb does not move but also when any other visible category is left VP-internally. A typical case is the Swedish verb particle construction, where a particle remains inside VP and an object pronoun cannot move across it (3-4).⁹

(3) a. Jag talade inte [_{VP} ~~talade~~ med henne]. [Swe.]

⁸ See a series of the papers by Chomsky (2000, 2001, 2004, 2008, 2013) for the details of the derivational mechanism that consists of the *probe-goal* system and a syntactic operation called *Agree*, in which a functional head probes a category acting as its goal and the uninterpretable ϕ -features of the former are valued by the interpretable counterpart of the latter.

⁹ Holmberg claims that not only verb particles but also indirect objects prevent OS:

i) a. Jag gav inte [_{VP} ~~gav~~ Elsa den]. [Swe.]

I gave not Elsa it
'I didn't give it to Elsa.'

b. *Jag gav den inte [_{VP} ~~gav~~ Elsa ~~den~~].

I gave it not Elsa

With the hypothesis that the object pronoun moves to cause downstep, Hosono (2013) accounts for the fact above in the way that the indirect full NP *Elsa* is the most appropriate candidate for the carrier of the focus of the sentence, and the final pitch peak is likely to occur on it; since downstep must not occur before it, the object pronoun must not move across it and cause downstep. I follow her account and do not discuss the issues on indirect objects in this paper.

I spoke not with her
 ‘I didn’t speak with her.’

b. *Jag talade henne inte [_{VP} ~~talade~~ med ~~henne~~].
 I spoke her not with

(4) a. De kastade inte [_{VP} ~~kastade~~ ut mig]. [Swe.]
 they threw not out me
 ‘They didn’t throw me out.’

b. *De kastade mig inte [_{VP} ~~kastade~~ ut mig].
 they threw me not out
 (Holmberg 1999:2,(2a-c))

Taking Holmberg’s claim into account, Chomsky (2001) presents an account of OS in the following way: only when an object rejects the interpretation that it receives in the base-generated position, is the EPP assigned to a phasal head and OS applies. Specifically, after all VP-internal categories have moved out of VP, an object is assigned a focus interpretation and/or new information by the rules of information structure in the Scandinavian languages. When the object is a full NP, *v** does not carry the EPP-feature, and consequently a full NP object does not move (5). An object pronoun, however, rejects such an interpretation. *v** carries the EPP, and the object pronoun moves to [Spec,*v**P]. In the moved position, it receives an interpretation which is consistent with its (inherent) categorical property, i.e. defocused and/or old information (5).¹⁰

(5) a. Jag kysste inte Marit. [Swe.]
 I kissed not Marit

¹⁰ Chomsky in fact argues that movement of the object pronoun to the position between the main verb (in the original position) and the negation occurs in syntax; the object pronoun moves across the negation in the phonological component. See his paper for the details.

‘I didn’t kiss Marit.’

- b. ... inte [_{VP} ~~kysste~~ Marit]
 ↑ focus/new info.

- (6) a. Jag kysste henne inte. [Swe.]
 I kissed her not
 ‘I didn’t kiss her.’

- b. ... henne [inte [_{VP} ~~kysste~~ henne]]
 ↑ defocus/old info.

It is questionable whether the interpretation of the object is actually responsible for the presence and absence of OS in the Scandinavian verb particle constructions. The particle class includes ‘prepositions and adverbs with locative or temporal meaning’ (Kristoffersen 2000:288,ft.12). As we saw in (3-4), object pronouns strictly follow verbal particles in Swedish. Norwegian allows both the shifted and unshifted pattern. According to Fretheim and Halvorsen (1975), *vekk* ‘aside’ always follows object pronouns (7a), whereas *på* ‘at’ always precedes them (7d). *Gjennom* ‘through’ (7b) and *over* ‘over’ (7c) may or may not precede object pronouns, but the acceptability differs between native speakers.

- (7) a. Hun la (^{OK}den) vekk (*den). [Nor.]
 she put it aside it
 ‘She put it aside.’

- b. Han har tenkt ([?]det) gjennom (^{OK}det).
 he has thought it through it
 ‘He has thought it through.’

- c. Han har tenkt (*[?]det) over (^{OK}det).
 he has thought it over it
 ‘He has thought it over.’
- d. De så (*dem) på (^{OK}dem).
 they looked them at them
 ‘They looked at them.’
 (Fretheim and Halvorsen 1975:458-459,(17-20))

In Danish, object pronouns precede adverbial particles, as illustrated in (2a), which is repeated in (8a) below. Some prepositions, e.g. *på* ‘on, in(to)’ and *om* ‘on’, however, strictly precede objects (8b). These facts indicate that the presence or absence of OS is determined by each individual particle; hence, the interpretation of the object pronoun is irrelevant to the application of OS.

- (8) a. Jeg skrev (^{OK}det) op (*det). [Dan.]
 I wrote (it) up (it)
 ‘I wrote the number/it down.’
- b. Vi tage (*Landet) på (^{OK}Landet) (*Lørdag) om (^{OK}Lørdag).
 we take (the-country) in (the-country) (Saturday) on (Saturday)
 ‘We go into the country on Saturday.’

The question would be addressed whether the difference in grammaticality illustrated in (7-8) can be accounted for in semantic terms.¹¹ According to the recent literature (e.g. Andreasson 2010), an object pronoun remains in situ when it refers, e.g. to a VP, as in the answer sentence such as (*did you play the piano yesterday? – yes, I did that*, contrary to the case in which an object pronoun refers to a noun phrase. The point here is that it is attributed to the property of individual particles of each Scandinavian variety whether an object pronoun moves across them or not: an object (pronoun) follows some particle groups

¹¹ I would like to thank Johan Brandler (p.c.) for addressing this question.

((7d) and (8b)) but can precede other groups ((7a-c) and (8a)). Thus, whether an object pronoun moves across a particle cannot be derived from the semantic properties that are imposed on object pronouns.

Fox and Pesetsky (2005) propose a derivational syntactic account of OS, *Cyclic Linearization*, in which successive cyclicity of movement is associated with order preservation. In this system, the information on linearization established at S-O is not deleted in the course of derivation, but is added to the ordering information established at the next S-O. Assume that $[_D X Y Z]$ is a domain D that is sent to the phonological component at an S-O point. The ordering information at the S-O of D is $X < Y$ and $Y < Z$ ('<' means *precedes*). Assume further i) that A merges with D, which results in $A < [_D \dots]$, ii) that some category inside D moves higher than A, and iii) that the next domain D' is spelled out. Some derivational cases can be considered:

- (9) a. $[_{D'} \dots X A [_D \cancel{X} Y Z]]$ ($X < A$, $A < [_D \dots]$; thus, $X < Y$)
 b. $*[_{D'} \dots Y A [_D X \cancel{Y} Z]]$ ($Y < A$, $A < [_D \dots]$; thus, $Y < X$)
 c. $[_{D'} \dots X Y A [_D \cancel{X} \cancel{Y} Z]]$ ($X < Y$, $Y < A$, $A < [_D \dots]$)

In (9a), X moves higher than A, which results in $X < A$. The ordering information, $A < [_D \dots]$, indicates $A < Y$. The sequences, $X < A$ and $A < Y$, indicate that X precedes Y at the S-O of D'. Since this ordering information does not contradict the one at the S-O of D, i.e. $X < Y$, the derivation is licit. In (9b), Y moves higher than A, which results in $Y < A$. The ordering information, $A < [_D \dots]$, implies $A < X$. The sequences, $Y < A$ and $A < X$, indicate $Y < X$. This ordering information contradicts the one at the S-O of D, i.e. $X < Y$. Thus, this is an illicit derivation. In (9c), both X and Y move, which results in $X < Y$ and $Y < A$. The original ordering information, $X < Y$, is still maintained after both X and Y move

from inside D, which makes the derivation licit.¹²

Specifically, Fox and Pesetsky's system applies to OS in the following way. Assuming that CP and VP are S-O domains and that the subject is not involved in linearization, the ordering information at the S-O of VP is V<O. In simple tense forms (10), both the main verb *såg* and the object pronoun *den* move after the sentential adverb *inte* merges to VP. When CP is spelled out, the verb still precedes the pronoun, i.e. V<O. Since the ordering information at the S-O of CP does not contradict the one at the S-O of VP, the derivation is licit.¹³

- (10) [_{CP} jag såg [_{TP} ~~gag~~ den inte [_{VP} såg ~~den~~]]]
 (V<O at the S-O of VP, and V<O at the S-O of CP)

The proposed mechanism cannot provide a coherent account for parametric differences in the Scandinavian verb particle constructions illustrated in (2). Object pronouns cannot move across verb particles in Swedish, whereas they can move in Norwegian. Fox and Pesetsky refer to the Swedish case, and claim that when object pronouns move, the ordering information at the S-O of VP, i.e. particle<O, contradicts the one at the S-O of CP, i.e. O<particle; thus, the derivation is illicit as illustrated in (11a). This analysis, however, does not

¹² One more derivational case that Fox and Pesetsky give is illustrated below:

- i) [_{D'} ... Y A [_D ~~X~~ ~~Y~~ ~~Z~~]] (Y<A, A<[_D ...])

After Y moves higher than A, which results in Y<A, the domain, [_D ...], is subject to ellipsis. They claim that the illicit movement of Y, which would yield the contradictory ordering information, i.e. Y<X, is remedied under the ellipsis of the previous S-O domain.

¹³ The ungrammatical derivation in complex tense forms, e.g. (Swe.) **jag har den inte sett* (I have it not seen) (cf. *jag har inte sett den* (I have not seen it 'I haven't seen it')), in which the object pronoun *den* moves but the past participle main verb *sett* does not move, is accounted for in terms of the illicit case (9b). As illustrated in i), the ordering information at the S-O of VP is V<O. After movement of the object pronoun, however, it precedes the main verb at the S-O of CP, i.e. O<V. Since the ordering information at the S-O of VP contradicts the one at the S-O of CP, this derivation is illicit.

- i) **[_{CP} jag har [_{TP} ~~gag~~ den inte ~~har~~ [_{VP} sett ~~den~~]]]*
 (V<O at the S-O of VP, but O<V at the S-O of CP)

extend to Norwegian, in which object pronouns follow verb particles at the S-O of VP, i.e. particle<O.¹⁴ Object pronouns precede verb particles at the S-O of CP, i.e. O<particle. Though the ordering information at the S-O of VP contradicts the one at the S-O of CP, the construction is grammatical as illustrated in (11b).

- (11) a. *[_{CP} jag skrev [_{TP} jag det [_{VP} skrev upp det]]] [Swe.]
 (particle<O at the S-O of VP, but O<particle at the S-O of CP)
- b. [_{CP} jeg skrev [_{TP} jeg det [_{VP} skrev op det]]] [Nor.]
 (particle<O at the S-O of VP, but O<particle at the S-O of CP)

3. The intonational properties of the Scandinavian languages¹⁵

The Swedish dialects are traditionally classified by their word accent system. Most of the Swedish dialects maintain a distinction in word accents: accent 1 and accent 2. Accent 2 cannot occur on the last syllable of a sentence (including the only syllable of a monosyllabic word), and always requires an unstressed syllable after an accented syllable. Thus, all monosyllabic words have accent 1, whereas di- and polysyllabic words have either accent 1 or accent 2. Each of the word accents is associated with a tonal pattern that consists of a H(igh) and/or a L(ow). In East Swedish spoken, e.g. in Stockholm, accent 1 is represented as

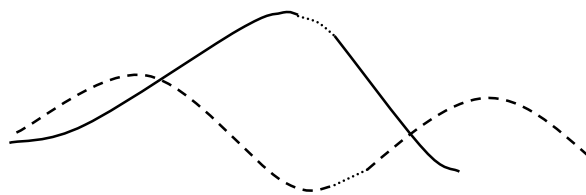
¹⁴ As stated in footnote 6, I assume here that an object is base-generated to the right of a particle in verb particle constructions (e.g. Engels and Vikner 2013, 2014).

¹⁵ The description in this section is based on Meyer (1937), Gårding (1975), Bruce (1977), Bruce and Gårding (1978), and Bruce (1982, 1994, 2005, 2007) for Swedish; Haugen (1967), Fretheim (1992), Fretheim and Nilsen (1992), Gussenhoven (2004), and Kristoffersen (2000, 2006, 2007) for Norwegian; Kristoffersen (2008) and Garbacz (2009) for Övdalian; Thorsen (1982), Rischel (1983, 1986), Basbøll (1985, 2005), Dyhr (1992), Grønnum (1998), Bruce and Hermans (1999), Bruce (2007), and Grønnum and Basbøll (2007) for Danish.

HL*, in which an accent is associated with a L. Accent 2 is represented as H*L, in which an accent is associated with a H.

Övdalian, the Swedish dialect spoken in the Älvdalen area (in Dalarna), has complex pitch properties. Accent 1 is represented as L*H*(L), in which a stressed syllable consists of a L and the following H. For sentence-final disyllabic words, the H peak occurs on the final part of a stressed syllable, which is followed by the L on the next, final syllable. Thus, when the disyllabic accent 1 word *skenet* [stʃi:neð] ‘the shine’ appears in sentence-final position, the H peak occurs on the final part of the stressed syllable *ske-*, which is followed by the L on the next syllable *-net*; see (12). Accent 2 (of disyllabic words) is represented as LH*LH(L), in which both a stressed syllable and the following unstressed syllable are associated with a H. Thus, when the disyllabic accent 2 word *skina* [skaina] ‘to shine’ appears in sentence-final position, both the first stressed syllable *ski-* and the following syllable *-na* consist of a rise, a H peak and a fall. The pitch then lowers sentence-finally; see (12).

(12) Accent 1 (*skenet* ‘the shine’) and accent 2 (*skina* ‘to shine’) in Övdalian:



—— : (vowel of) accent 1; - - - - - : (vowel of) accent 2;
 : consonant

(From Kristoffersen 2008:138, Fig. 20)

Most Norwegian dialects make a similar distinction between accent 1 and accent 2. The Norwegian word accent system has been traditionally analyzed in the following way: both accent 1 and accent 2 are assumed to have a basic tone;

an additional leading tone which is associated with an accent occurs before a basic tone for accent 2. In East Norwegian spoken, e.g. in Oslo, the basic word tone is LH. Accent 1 is represented as L*H, in which an accent is associated with a L. Accent 2 is represented as H*LH, in which a leading H is associated with an accent before the basic LH tone.¹⁶

East Danish spoken, e.g. in Copenhagen, has a sound property, *stød*, instead of the distinction in word accents observed in Swedish and Norwegian. *Stød* is uttered by constricting the glottis. It occurs on a syllable with a relatively high pitch, after which the F0 decreases drastically. It is widely claimed that the distribution of *stød* words corresponds to that of accent 1 words, and the distribution of non-*stød* words corresponds to that of accent 2 words. In the relevant context here, *stød* obligatorily occurs before the clitic form of the weak pronominal objects, *den* and *det* (/ən, əð/), when the preceding word has a short full vowel: e.g. *på den* ‘on it’ [pɔ[?]ən].¹⁷ The intonation pattern of East Danish is described as L*H, in which an accent is associated with a L and the next H typically occurs on the syllable following the accented syllable. A general declining trend can be observed towards the end of a sentence.¹⁸

4. Verb particle constructions and the intonational properties

4.1. The properties of the Scandinavian verb particle constructions¹⁹

¹⁶ Another important feature of the Swedish and Norwegian varieties is the *focal H contour*, which realizes the focus of a sentence. The focal H contour is added to the H pitch gesture of the accented syllable of a focused word in the Swedish dialects such as East Swedish and Övdalian. In the Norwegian dialects such as East Norwegian, the focal H contour is realized by raising the (second) H of a focused word extremely high.

¹⁷ ‘?’ stands for a *stød* sound.

¹⁸ Danish does not have a default pitch accent that occurs on the last intonational phrase of a sentence. To focalize a word, the H on a focused word is raised higher than the H on the preceding word(s).

¹⁹ The description in this section is based on Fretheim and Halvorsen (1975), Haugen (1987),

The Scandinavian languages do not behave in a uniform way with regard to the accentuation of verb particle constructions. In Swedish and Danish, particles are accented (they have accent 1 in Swedish, since most of them are monosyllabic); see (13).²⁰ In contrast, Norwegian displays a more flexible accentuation, as the accent can be located either on the main verb or on the particle. *'komme ,in* below can also be uttered as *,komme 'in*, where the primary accent is located on the particle.

- | | | | |
|------|-----------------------------------|--------------------------|--------------------------|
| (13) | Swedish: | Norwegian: | |
| | ,komma 'in | 'komme ,in | 'enter' |
| | han har ,tänkt 'över det | han har 'tenkt over ,det | 'he has thought it over' |
| | har du ,gjort 'rent | har du 'gjort ,rent | 'have you cleaned up?' |
| | (Bruce and Hermans 1999:628,(10)) | | |

Main verbs in Norwegian obligatorily have accent 2 when they are accented. Verbs that inherently have accent 2, e.g. *komme* 'come' and *finne* 'find' in (14), maintain that accent. Verbs that have accent 1, e.g. *kommer* 'comes' and *finner* 'finds' in (14), are accented when they are followed by a particle, and they obtain accent 2. When a particle has accent 2 and is primarily stressed, however, accent shift is not likely to occur.

- | | | | |
|------|---|-----------------------------|------------------|
| (14) | ² komme + ¹ over | → ² komme ,over | 'to come across' |
| | ² finne + ¹ ut | → ² finne ,ut | 'to find out' |
| | ¹ kommer + ¹ over | → ² kommer ,over | 'comes across' |
| | ¹ finner + ¹ ut | → ² finner ,ut | 'finds out' |

Bruce and Hermans (1999), Kristoffersen (2000) and Hellan (2005).

²⁰ ‘, ’ stands for a primary accent, and ‘ ’ stands for a secondary accent.

(Kristoffersen 2000:288,(20))

Accent shift in Norwegian occurs when an object pronoun intervenes between a main verb and a particle. In (15), both *setter* ‘sets’ and *ga* ‘gave’ inherently have accent 1. As illustrated by ¹*ga+den*, the combination of a main verb and an object pronoun does not affect accent shift. When a particle is present, those main verbs acquire accent 2. Norwegian allows both the shifted and unshifted pattern as illustrated in (7a-d), repeated in (16a-d). A particle can either precede or follow an object pronoun when a main verb has accent 2; see (16a-c).²¹ A particle strictly precedes an object pronoun when a main verb has accent 1; see (16d).

- (15) ¹setter → ²setter + han + den + frem? ‘does he set it forward?’
 Jon ¹ga+ den → Jon ²ga + den + bort ‘Jon gave it away’
 (Hellan 2005:141-142,(9))
- (16) a. Hun ²la (^{OK}den) vekk (*den). ‘She put it aside.’
 b. Han har ²tenkt ([?]det) gjennom (^{OK}det). ‘He has thought it through.’
 c. Han har ²tenkt (*[?]det) over (^{OK}det). ‘He has thought it over.’
 d. De ¹så (*dem) på (^{OK}dem). ‘They looked at them.’

From the description above, we make the following predictions of the pitch contours of the Scandinavian verb particle constructions. In East Swedish, particles obligatorily have an accent. Since most particles are monosyllabic, they have accent 1, i.e. HL*. The initial H of the HL* contour of a particle is the continuation of the falling pitch on a main verb. It is predicted that the pitch peak occurs on the main verb, and the pitch lowers on the particle following it and falls on the sentence-final object pronoun.

²¹ Some Norwegian particles always follow an object pronoun as in (16a), as stated in section 2.

The accent 1 of Övdalian is represented as L*H*(L), in which both a L and the following H are associated with an accent. The pitch falls sentence-finally regardless of whether a sentence-final word has accent 1 or accent 2. It is predicted that when a monosyllabic particle with accent 1 follows the main verb, the pitch falls before the particle and then rises on it. The pitch will then fall on the sentence-final object pronoun.

In East Norwegian, accent shift occurs when a main verb is accented and an object pronoun intervenes between a main verb and a particle. The main verb in verb particle constructions has accent 2, H*LH, in which an accent is associated with the first H and another H is added after the pitch falls on the accented syllable of the main verb. It is predicted that the unstressed object pronoun as well as the particle with less prominence than the main verb are incorporated into the pitch contour of the main verb and form part of its H*LH contour.

The basic pitch pattern of East Danish is L*H, in which an accent is associated with a L and the next H typically occurs on the syllable following the accented syllable. Particles obligatorily have an accent in East Danish. It is predicted that an unstressed object pronoun as well as a particle with less prominence than a main verb are incorporated into the pitch contour of the main verb and form part of its L*H contour.

4.2. Pitch contours of the Scandinavian verb particle constructions

In this section, I present the pitch contours of verb particle constructions of the Scandinavian varieties investigated: East Swedish, Övdalian, East Norwegian and East Danish.

Experimental procedure:

i) The target sentence contains a main verb (accent 2), a particle (accent 1) and an object pronoun, with the distinction in word accents irrelevant for East Danish. Those sentential elements are ordered according to the grammatical word order of each of the Scandinavian varieties investigated, which I turn to soon below;

ii) The context: On the basis of the literature on information structure (e.g. Lambrecht 1994, Vilkuna 1995, Kiss 1998), an appropriate context, *polarity-focus*, was built with a question and answer, the latter corresponding to a target sentence. Theoretically speaking, the main verb carries the focus of an answer sentence, provided that the sentence has one and the only one focus and that there are no sentences that do not have a focus (cf. Lambrecht, 1994). It is also cross-linguistically confirmed that the focus of a sentence is carried by a main verb both in (contrastive) verb-focus and polarity-focus (cf. Vilkuna, 1995). Polarity-focus is the most neutral context to observe the intonational properties of verb particle constructions. The test sentences are given below:

(17) Plöjer du upp din åker? – Ja, jag plöjer upp den. [Swe.]
 plow you up your field yes I plow up it
 ‘Do you plow up your field? – Yes, I plow it up.’

Winder du aut buotje daj? – Ja, ig winder aut åna. [Övd.]
 throw you out the-book your yes I throw out it
 ‘Do you throw out your book? – Yes, I throw it out.’

Pløyer du opp åkeren din? – Ja, jeg pløyer den opp. [Nor.]
 plow you up field your yes I plow it up
 ‘Do you plow up your field? – Yes, I plow it up.’

Pløjer du din mark op? – Ja, jeg pløjer den op. [Dan.]
 plow you your field up yes I plow it up
 ‘Do you plow up your field? – Yes, I plow it up.’

iii) The conditions under which the test sentence was read: The informants were asked to read the test sentence five times; consequently, each sentence was recorded five times. They were asked to read the question-answer pair in appropriately rapid speech, in such a way as they speak in a real-life conversation; and

iv) The way of data collection and data analysis: The recordings were made one by one, typically in a small lecture room, by the author herself using a laptop with Praat software (Boersma and Weenink 1996) and a microphone. For the Scandinavian varieties that were not recorded by the author herself, the author commissioned an experimental phonetician in each relevant Scandinavian area to carry out the recording; commissioned phoneticians were asked to send the sound file to the author by e-mail attachment. Data was collected from at least four (two female and two male) native speakers for each of the Scandinavian varieties investigated. The sound data was analyzed with Praat software by the author herself.

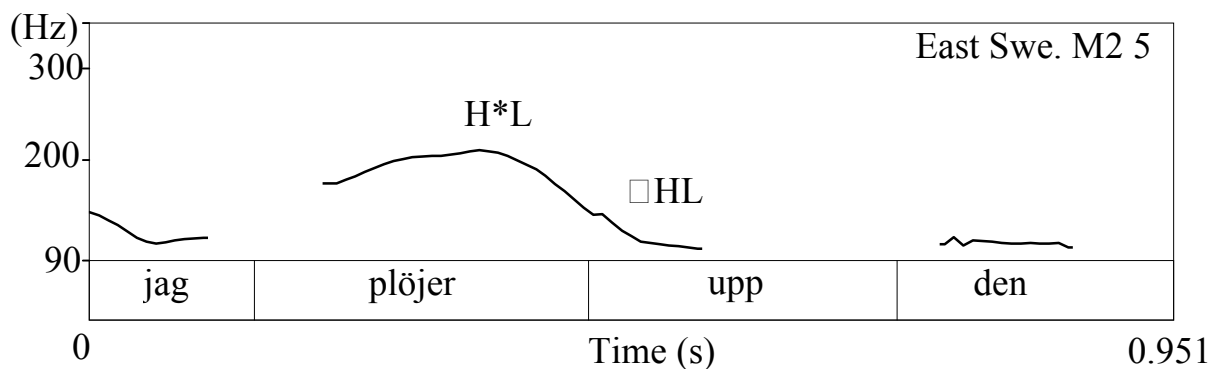
The pitch contours of East Swedish and Övdalian, in which an object pronoun cannot move across a particle, are presented in (18a-b).²² As predicted above, the pitch peak typically occurs on the main verb in East Swedish (18a). After the pitch falls on the main verb, the following particle receives a low pitch. The pitch is also low on the sentence-final object pronoun. In Övdalian (18b) too, the pitch peak is likely to occur on the main verb. After the pitch falls on the accented syllable of the main verb, the pitch rises again on the following particle and lowers on the sentence-final object pronoun, which conforms to the

²² The notation *East Swe. M2 5* at the upper right stands for the dialectal name, the sex, the informant number and the token number (token number 1 through 5).

prediction above.²³ Note that though particles are accented in both the Swedish varieties, downstep occurs on the H of the particle, as indicated by ‘□’ located in front it.

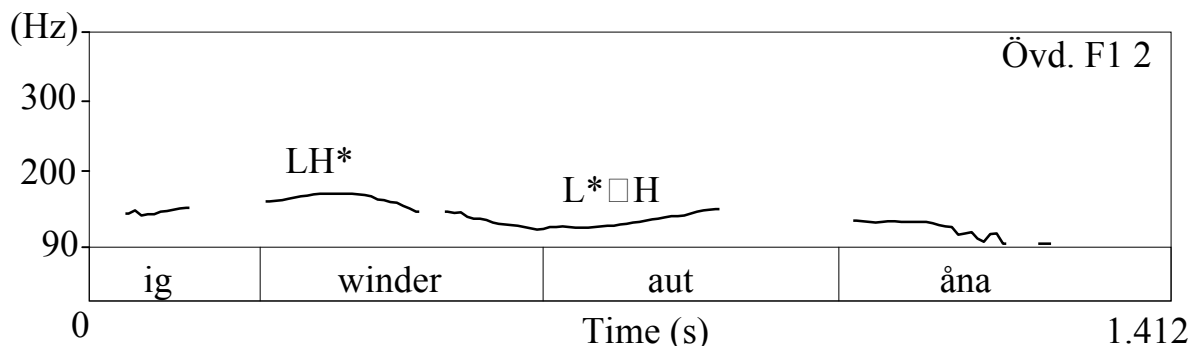
(18) a. East Swedish:

Jag plöjer upp den. (I plow up it ‘I plow it up’)



b. Övdalian:

Ig winder aut åna. (I throw out it ‘I throw it out’)



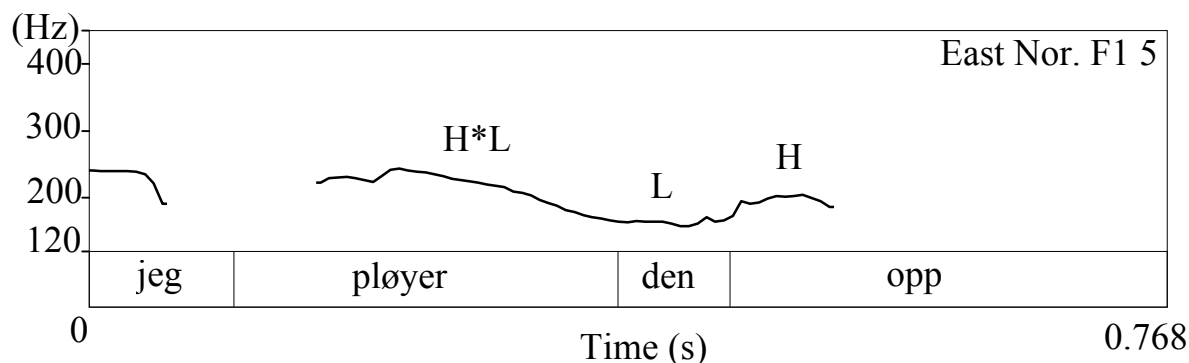
The pitch contours of East Norwegian and East Danish, in which an object pronoun moves across a particle, are presented in (19a-b). In East Norwegian (19a), the pitch falls on the accented syllable of the main verb. The pitch is low on the shifted object pronoun. The pitch rises on the following particle, and the final pitch peak occurs on it. As predicted above, being incorporated into the

²³ The pitch can be low on a particle and rise on the primary stressed syllable of a sentence-final object pronoun in some cases.

H*LH pitch contour of the main verb, the shifted, unstressed object pronoun forms the L, and the following particle with less prominence than the main verb forms the final H, of the H*LH contour of the main verb. In East Danish (19b), the pitch starts with the accented L on the main verb and is still low on the shifted object pronoun.²⁴ The pitch rises on the following particle, and the final pitch peak occurs on it. As predicted, being incorporated into the L*H pitch contour of the main verb, the shifted, unstressed object pronoun forms a part of L, and the following particle with less prominence than the main verb forms the final H, of the L*H contour of the main verb. In both East Norwegian and East Danish, the pitch level on the particle is either the same as or even higher than that on the main verb. Note that in East Danish (19b), a *stød* occurs before the monosyllabic object pronoun, as shown by the break of the pitch contour.

(19) a. East Norwegian:

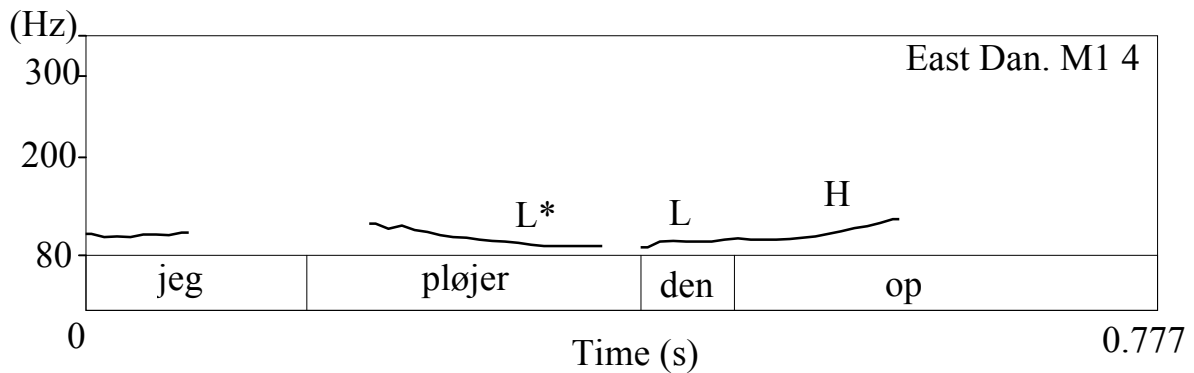
Jeg pløyer den opp. (I plow it up ‘I plow it up’)



b. East Danish:

Jeg pløjer den op. (I plow it up ‘I plow it up’)

²⁴ The high pitch on the first half of the main verb is a leading H tone.



The observation in this section that the pitch peak occurs on the main verb in East Swedish and Övdalian but on the sentence-final particle in East Norwegian and East Danish is confirmed by the statistical data on downstep in the Scandinavian verb particle constructions, which I give in Appendix I.

5. Discussions

The questions to be addressed are i) why an object pronoun cannot move across a particle in East Swedish and Övdalian but moves in East Norwegian and East Danish, and ii) how this fact relates to the intonational properties of those Scandinavian varieties. We saw in section 4.2. that the experimental result of all the Scandinavian varieties investigated conforms to the prediction presented in section 4.1. This indicates that the intonation pattern of verb particle constructions conforms to the basic intonational properties of each of the Scandinavian varieties investigated.

In East Swedish (18a), the pitch peak typically occurs on the main verb. The initial H of the HL* contour of the accent 1 particle is the continuation of the falling pitch on the main verb. When an object pronoun follows the particle, the pitch simply falls sentence-finally. Thus, the main verb, the particle and the object pronoun in that order form a HL contour, i.e. the basic pitch pattern of East Swedish.

Let us now consider what would happen if the particle followed the object pronoun, instead. After the pitch falls on the object pronoun immediately following the main verb, the pitch would have to rise on the sentence-final particle so that it can get the initial H of a HL* contour. These pitch properties are not acceptable as Swedish pitch patterns.

In Övdalian (18b), accent 1 of particles is represented as L*H*(L), in which a stressed syllable consists of a L and the following H. The pitch falls sentence-finally regardless of whether a sentence-final word has accent 1 or accent 2. When an object pronoun follows the particle, the pitch that rises on the particle can simply fall on the sentence-final object pronoun. Imagine that the particle would follow an object pronoun. The pitch would lower on the object pronoun that follows the main verb. The pitch would rise on the particle following the object pronoun and the sentence-final pitch pattern would be LH, which does not conform to the basic intonation pattern of Övdalian in which the pitch should lower in sentence-final position.

In East Norwegian (19a), a shifted object pronoun forms the L, and the following particle forms the final H, of the H*LH contour of the accent 2 main verb. Being incorporated into the H*LH contour of the main verb, the pitch always rises on a monosyllabic particle after the pitch falls on the main verb. Now hypothesize that the object pronoun would follow the particle. After the pitch falls on the main verb, the pitch would rise on the following particle and then fall on the sentence-final object pronoun. This pitch contour does not conform to the basic pitch pattern of the Norwegian accent 2, i.e. HLH. Thus, a monosyllabic particle must strictly follow an object pronoun, as illustrated in (19a).

In the case of disyllabic particles, there is an option for the pitch to either simply fall or to fall and rise. As illustrated in (16b-c), a disyllabic particle can either precede or follow an object pronoun. When a disyllabic particle precedes

an object pronoun, the pitch falls on the former and rises on the latter. When a disyllabic particle follows an object pronoun, the pitch lowers on the latter and rises on the former. The pitch movement is a gradient phenomenon, not a binary property. Thus, the acceptability varies among Norwegian native speakers as stated in section 2.

When the main verb has accent 1, L*H, as in (16d), an initial H does not occur on the main verb contrary to accent 2. When a monosyllabic particle directly follows the main verb, the pitch starts to rise on the latter. The pitch is still low on the following monosyllabic particle, since it has L*H too. The pitch then rises on the sentence-final object pronoun. The accent 1 main verb, the particle and the object pronoun in that order form a LH contour together. If the particle were to follow the object pronoun, however, the pitch would rise on the object pronoun following the accent 1 main verb. The pitch would then fall on the sentence-final particle. This pitch pattern does not conform to the basic pitch pattern of the Norwegian accent 1, i.e. LH.

In East Danish (19b), the object pronoun forms a part of L, and the accented particle forms the final H, of the L*H contour of the main verb. This pitch pattern conforms to the basic pattern of East Danish, i.e. LH. The pitch level on the particle is even higher than that on the main verb.

Recall that *stød* obligatorily occurs before the clitic form of the weak pronominal objects, *den* and *det* (/ən, əð/), when the preceding word has a short full vowel, as illustrated in (19b). If we assumed that the object pronoun followed the particle, the particle would form the final H of the L*H contour of the preceding main verb. As stated in section 3, *stød* occurs on a syllable with a relatively high pitch. The vowel of a particle has a short full vowel and the final consonant of it almost always disappears. Since the primary stressed syllable of a particle has a high pitch, a *stød* would be likely to occur on it. But after it occurs, the F0 decreases drastically as stated in section 3. The pitch should fall

on the sentence-final object pronoun. This pitch pattern is not acceptable as Danish pitch patterns.

The fact that the pitch contour of the grammatical word order of verb particle constructions conforms to the basic pitch pattern of each Scandinavian variety in fact indicates that the pitch contour of the grammatical order conforms to that of the main verb. In East Swedish (18a), the main verb with accent 2 has the HL contour; the H of the following particle is the continuation of the falling pitch of the main verb and downstepped. In Övdalian (18b), the final pitch contour is LH(L), which would appear to be the pitch contour of the particle with accent 1. With the H of the accented particle downstepped, however, that H is the continuation of the pitch gesture of the main verb with accent 2: the LH(L) contour of the particle is part of the LHLH(L) contour of the accent 2 main verb. In East Norwegian (19a), the main verb with accent 2 has the HLH contour, in which (the object pronoun and) the particle is incorporated. In East Danish without the distinction in word accents (19b), the accented main verb has the LH pitch pattern, in which (the object pronoun and) the particle is incorporated.

The reason why the pitch contour of the grammatical word order conforms to that of the main verb is derived from the fact that the main verb carries the focus of verb particle constructions. Verb particle construction consists of a main verb and a particle. They form a close unit, regardless of whether an object pronoun intervenes between them. In the context of polarity-focus, the most neutral context for verb particle constructions, the main verb carries the focus of the sentence. Thus, it is plausible that the pitch contour of the grammatical word order conforms to that of the main verb, regardless of whether the main verb is accented as in the Norwegian varieties or a particle is accented as in the Swedish and Danish varieties.

6. Conclusion

In this paper, I have discussed the Scandinavian verb particle constructions from the perspective of the intonational properties of the Scandinavian languages. I have shown with experimental data that in East Swedish and Övdalian, in both of which object pronouns cannot move across verb particles, the pitch peak occurs on the main verb. In East Norwegian and East Danish, in both of which object pronouns move across verb particles, on the other hand, the pitch peak occurs on the sentence-final particle.

In each of these Scandinavian varieties, the grammatical word order of verb particle constructions conforms to the basic pitch pattern of the main verb, i.e. a HL contour in East Swedish, a LHLH(L) contour in Övdalian, a HLH contour in East Norwegian and a LH contour in East Danish. Those basic pitch patterns correlate with the absence of OS in East Swedish and Övdalian on one hand, and its presence in East Norwegian and East Danish on the other. That is, the basic pitch pattern is broken up by the presence of OS in the former two and by its absence in the latter two.

In this paper, I have not been concerned with the word order of verb particle constructions that contain a full NP. In Danish (20a), a full NP as well as an object pronoun must precede a particle. In Norwegian (20b), a full NP can either precede or follow a particle contrary to an object pronoun which must precede a particle. In Swedish (20c) and Övdalian (20d), both a full NP and an object pronoun must follow a particle. Many intonation patterns are expected for full NPs depending on contexts. I leave the issue on the word order of verb particle constructions that contain a full NP for future research.

- (20) a. Jeg skrev (^{OK}nummeret/^{OK}det) op (*nummeret/*det). [Dan.]
 b. Jeg skrev (^{OK}nummeret/^{OK}det) opp (^{OK}nummeret/*det). [Nor.]
 c. Jag skrev (*numret/*det) upp (^{OK}numret/^{OK}det). [Swe.]
 I wrote (the-number/it) up (the-number/it)
 ‘I wrote the number/it down.’
 (Holmberg 1999:2,(3a-c))
 d. Å ar aingt (*målakalln/*eð) upp (^{OK}målakalln/^{OK}eð). [Övd.]
 she has hung (the-picture/it) up (the-picture/it)
 ‘She has hung it up/hung up the picture.’
 (Garbacz 2009:84,(10c),(11b))

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References

- Andréasson, Maia. 2009. Pronominal Object Shift – not just a matter of shifting or not. *Working Papers in Scandinavian Syntax* 84:1-20.
- Basbøll, Hans. 1985. Stød in modern Danish. *Folia Linguistica* 19:1-50.
- Basbøll, Hans. 2005. *The Phonology of Danish*. Oxford: Oxford University Press.
- Bobaljik, Jonathan D., and Dianne Jonas. 1996. Subject positions and the role of TP. *Linguistic Inquiry* 27:195-236.
- Boersma, Paul, and David Weenink. 1996. Praat, a system for doing phonetics by computer, version 3.4. *Institute of Phonetic Sciences of the University of Amsterdam, Report* 132.
- Broekhuis, Hans. 2008. *Derivations and Evaluations: Object Shift in the Germanic Languages*. Berlin: Mouton de Gruyter.
- Bruce, Gösta. 1977. Swedish Word accents in sentence perspective. *Travaux de L'Institut de Linguistique de Lund* XII. CWK GLEERUP.

- Bruce, Gösta. 1982. Experiments with the Swedish intonation model. Preprints, *Working Group on Intonation*, ed. by Hiroya Fujisaki, and Eva Gårding, 35-45. The XIIIth International Congress of Linguists, Tokyo.
- Bruce, Gösta. 1994. Prosody from dialect to dialogue. In *Proceedings from International Symposium on Prosody*, ed. by Hiroya Fujisaki, 91-102. Tokyo: Japan Society for the Promotion of Science, No.152 Committee on Intelligent Processing of Spoken and Written Languages.
- Bruce, Gösta. 2005. Intonational Prominence in Varieties of Swedish Revisited. In *Prosodic Typology: The Phonology of Intonation and Phrasing*, ed. by Sun-Ah Jun, 410-429. Oxford: Oxford University Press.
- Bruce, Gösta. 2007. Components of a prosodic typology of Swedish intonation. In *Tones and Tunes Volume 1: Typological Studies in Word and Sentence Prosody*, ed. by Tomas Riad, and Carlos Gussenhoven, 113-146. Berlin: Mouton de Gruyter.
- Bruce, Gösta, and Eva Gårding. 1978. A prosodic typology for Swedish dialects. In *Nordic Prosody*, ed. by Eva Gårding, Gösta Bruce, and Robert Bannert, 219-228. Department of Linguistics, Lund University.
- Bruce, Gösta, and Ben Hermans. 1999. Word tone in Germanic languages. In *Word Prosodic Systems in the Languages of Europe*, ed. by Harry van der Hulst, 605-658. Berlin: Mouton de Gruyter.
- Chomsky, Noam. 1981. *Lectures on Government and Binding*. New York: Mouton de Gruyter.
- Chomsky, Noam. 1986. *Knowledge of Language*. Westport, CT: Praeger.
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2000. Minimalist inquiries: the framework. In *Step By Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, ed. by Roger Martin, David Michaels, and Juan Uriagereka, 89-156. Cambridge, MA: MIT Press.

- Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: A Life in Language*, ed. by Michael Kenstowicz, 1-52. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2004. Beyond explanatory adequacy. *Structures and Beyond: The Cartography of Syntactic Structures, Volume 3*, ed. by Adriana Belletti, 104-131. Oxford: Oxford University Press.
- Chomsky, Noam. 2008. On phases. In *Foundational Issues in Linguistic Inquiry: Essays in Honor of Jean-Roger Vergnaud*, ed. by Robert Freidin, Carlos P. Otero, and Maria Luisa Zubizarreta, 133-166. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2013. Problems of projection. To appear in *Lingua*.
- Collins, Chris, and Höskuldur Thráinsson. 1996. VP-internal structure and object shift in Icelandic. *Linguistic Inquiry* 27:391-444.
- Diesing, Molly. 1992. *Indefinites*. Cambridge, MA: MIT Press.
- Diesing, Molly. 1997. Yiddish VP order and the typology of object movement in Germanic. *Natural Language and Linguistic Theory* 15:369-427.
- Dyhr, Niels-Jørn. 1992. An acoustical investigation of the fundamental frequency in Danish spontaneous speech. In *Nordic Prosody VI, Papers from a Symposium*, ed. by Björn Granström, and Lennart Nord, 23-32. Stockholm: Almqvist & Wiksell International.
- Engels, Eva, and Sten Vikner. 2013. Object Shift and remnant VP-topicalisation: Danish and Swedish verb particles and ‘let’-causatives. *Nordic Journal of Linguistics* 36:219-244.
- Engels, Eva, and Sten Vikner. 2014. *Scandinavian Object Shift and Optimality Theory*. New York: Palgrave Macmillan.
- Erteschik-Shir, Nomi. 2005a. Sound patterns of syntax: Object Shift. *Theoretical Linguistics* 31:47-93.
- Erteschik-Shir, Nomi. 2005b. What is syntax? *Theoretical Linguistics* 31:263-274.

- Fox, Danny, and David Pesetsky. 2005. Cyclic linearization of syntactic structure. *Theoretical Linguistics* 31:1-45.
- Fretheim, Thorstein. 1992. Themehood, rhemehood, and Norwegian focus structure. *Folia Linguistica* 26:111-150.
- Fretheim, Thorstein, and Per-Kristian Halvorsen. 1975. Norwegian cliticization. In *The Nordic Languages and Modern Linguistics 2*, ed. by Karl-Hampus Dahlstedt, 446-465. Stockholm: Almqvist & Wiksell International.
- Fretheim, Thorstein, and Randi Alice Nilsen. 1992. The Norwegian broad-focus avoidance strategy. In *Nordic Prosody VI, Papers from a Symposium*, ed. by Björn Granström, and Lennart Nord, 49-64. Stockholm: Almqvist & Wiksell International.
- Garbacz, Piotr. 2009. Issues in Övdalian syntax. PhD dissertation, Lund University.
- Gårding, Eva. 1975. Toward a prosodic typology for Swedish dialects. In *The Nordic Languages and Modern Linguistics 2*, ed. by Karl-Hampus Dahlstedt, 466-474. Stockholm: Almqvist & Wiksell International.
- Gårding, Eva. 1998. Intonation in Swedish. In *Intonation Systems: A Survey of Twenty Languages*, ed. by Daniel Hirst, and Albert Di Cristo, 112-130. Cambridge: Cambridge University Press.
- Grønnum, Nina. 1998. Intonation in Danish. In *Intonation Systems: A Survey of Twenty Languages*, ed. by Daniel Hirst, and Albert Di Cristo, 131-151. Cambridge: Cambridge University Press.
- Grønnum, Nina, and Hans Basbøll. 2007. Danish stød: phonological and cognitive issues. In *Experimental Approaches to Phonology*, ed. by Maria-Josep Solé, Patrice peeter Beddor, and Manjari Ohala, 192-206. Oxford: Oxford University Press.
- Hart, Johan 't, René Collier, and Antonie Cohen. 1990. *A Perceptual Study of Intonation*. Cambridge: Cambridge University Press.

- Haugen, Einar. 1967. On the rules of Norwegian tonality. *Language* 43:185-202.
- Haugen, Einar. 1987. Danish, Norwegian and Swedish. In *The World's Major Languages*, ed. by Bernard Comrie, 125-144. London: Croom Helm.
- Hellan, Lars. 2005. Comments on Erteschik-Shir's article. *Theoretical Linguistics* 31:137-145.
- Hellan, Lars, and Christer Platzack. 1999. Pronouns in Scandinavian languages: an overview. In *Clitics in the Languages of Europe*, ed. by Henk van Riemsdijk, 123-142. Berlin: Mouton de Gruyter.
- Holmberg, Anders. 1986. Word order and syntactic features in the Scandinavian languages and English. PhD dissertation, University of Stockholm.
- Holmberg, Anders. 1999. Remarks on Holmberg's Generalization. *Studia Linguistica* 53:1-39.
- Holmberg, Anders, and Christer Platzack. 1995. *The Role of Inflection in Scandinavian Syntax*. Oxford: Oxford University Press.
- Hosono, Mayumi. 2013. Object Shift in the Scandinavian Languages – Syntax, Information Structure, and Intonation. PhD dissertation, Leiden University.
- Josefsson, Gunlög. 2003. Four myths about Object Shift in Swedish – and the truth.... In *Grammar in Focus: Festschrift for Christer Platzack, 18 November 2003, Volume 1*, ed. by Lars-Olof Delsing, Cecilia Falk, Gunlög Josefsson, and Halldór Á. Sigurðsson, 199-207. Department of Scandinavian Languages, Lund University.
- Josefsson, Gunlög. 2010. Object shift and optionality. An intricate interplay between syntax, prosody and information structure. *Working Papers in Scandinavian Syntax* 86:1-24.
- É. Kiss, Katalin. 1998. Identification focus versus information focus. *Language* 74:245-273.
- Kristoffersen, Gjert. 2000. *The Phonology of Norwegian*. Oxford: Oxford

University Press.

- Kristoffersen, Gjert. 2006. Markedness in urban East Norwegian tonal accent. *Nordic Journal of Linguistics* 29:95-135.
- Kristoffersen, Gjert. 2007. Dialect variation in East Norwegian tone. In *Tones and Tunes Volume 1: Typological Studies in Word and Sentence Prosody*, ed. by Tomas Riad, and Carlos Gussenhoven, 91-111. Berlin: Mouton de Gruyter.
- Kristoffersen, Gjert. 2008. Level stress in North Germanic. *Journal of Germanic Linguistics* 20:87-157.
- Lambrecht, Knud. 1994. *Information Structure and Sentence Form: Topic, Focus, and the Mental Representations of Discourse Referents*. Cambridge: Cambridge University Press.
- Levander, Lars. 1909. *Ävdalsmålet i Dalarna. Ordböjning och syntax*. Stockholm: P.A. Norstedt and Söner.
- Meyer, Ernst A. 1937. *Die Intonation im Schwedischen*. Stockholm studies in Scandinavian philology, University of Stockholm.
- Mikkelsen, Line. 2011. On prosody and focus in Object Shift. *Syntax* 14:230-264.
- Richards, Marc. 2006. Object Shift, phases, and transitive expletive constructions in Germanic. In *Linguistic Variation Yearbook 6*, ed. by Pierre Pica, Johan Rooryck, and Jeroen Van Craenenbroeck, 139-159. Amsterdam: John Benjamins.
- Rietveld, Antonie C.M., and Vincent J. van Heuven. 2009. *Algemene Fonetiek* [General Phonetics]. Bussum: Coutinho.
- Rischel, Jørgen. 1983. On unit accentuation in Danish – and the distinction between deep and surface phonology. *Folia Linguistica* 17:51-97.
- Rischel, Jørgen. 1986. Some reflections on levels of prosodic representation and prosodic categories. In *Nordic Prosody IV, Papers from a Symposium*, ed. by

- Kirsten Gregersen, and Hans Basbøll, 3-30. Copenhagen: Odense University Press.
- Roll, Mikael, Merle Horne, and Magnus Lindgren. 2007. Object Shift and event-related brain potentials. *Journal of Neurolinguistics* 20:462-481.
- Roll, Mikael, Merle Horne, and Magnus Lindgren. 2009. Left-edge boundary tone and main clause verb effects on syntactic processing in embedded clauses – an ERP study. *Journal of Neurolinguistics* 22:55-73.
- Sells, Peter. 2001. *Structure, Alignment and Optimality in Swedish*. Stanford, CA: CSLI Publications, Center for the Study of Language and Information, Stanford University.
- Svenonius, Peter. 2006. The verb-particle alternation in the Scandinavian languages. ms., University of Tromsø.
- Thorsen, Nina. 1982. Sentence intonation in Danish. Preprints, *Working Group on Intonation*, ed. by Hiroya Fujisaki, and Eva Gårding, 47-56. The XIIIth International Congress of Linguists, Tokyo.
- Vikner, Sten. 2001. The interpretation of Object Shift and optimality theory. In *Competition in Syntax*, ed. by Gereon Müller, and Wolfgang Sternefeld, 321-340. Berlin: Mouton de Gruyter.
- Vilkuna, Maria. 1995. Discourse configurationality in Finnish. In *Discourse Configurational Languages*, ed. by Katalin É. Kiss, 244-268. Oxford: Oxford University Press.

Appendix I: Statistical data

I present the statistical data on downstep in the Scandinavian verb particle constructions which confirms the observation in section 4.2. that the pitch peak occurs on the main verb in East Swedish and Övdalian, whereas it occurs on the

sentence-final particle in East Norwegian and East Danish. Downstep is here defined as the pitch difference between the first key pitch point P_1 that occurs relatively early in the utterance and the second key pitch point P_2 that follows towards the end of the utterance, which I refer to as the *downstep size*. When downstep is indeed a fall in pitch, its value will be positive. The higher the value is, the larger the downstep size is. The negative value indicates that downstep does not occur in a sentence – in fact, upstep occurs. The lower the value is, the higher the size of upstep/non-downstep is. Two key pitch points are determined semi-automatically: the first point is on the accented syllable of the main verb, and the second point is on the primary stressed syllable of a particle, i.e. the next accentable syllable after the main verb. The decrement at which the F0 lowers from the main verb to a particle is computed.

The downstep size is expressed in terms of a musical scale, using the *semitone* (st) as a convenient unit of measurement for the perceived magnitude of a change in pitch. The semitone is one-twelfth of an octave; an octave is a doubling of the F0. The Praat software measures the F0 in hertz (Hz). The interval between any two key pitch points in Hz can be converted to semitones by the following formula : $12 * [\log(P_1/P_2) / \log(2)]$.²⁵ A complication is that in my recordings, the time interval between P_1 and P_2 is shorter than 3 seconds; it does not normally exceed the duration of one second. It can be estimated that the pitch lowering in the sentence type I used should be roughly 2 semitones.²⁶ Thus, I define a proper instance of downstep in my materials as a pitch decrement between P_1 and P_2 larger than 2 semitones. This indicates that the difference in semitones between P_1 and P_2 must be larger than 2 to say that

²⁵ Without multiplication by 12, this formula computes the pitch interval in octaves.

²⁶ This estimate is based on the formula ($D = -11 / t + 1.5$) to compute the declination in semitones per second (= D) for utterances shorter than 5 seconds, where t is the duration of the utterance ('t Hart, Collier and Cohen, 1990, Rietveld and Van Heuven, 2009).

downstep actually occurs in a sentence.

Two dependent variables which characterize the extent of downstep are defined as follows. The first one is the *incidence of downstep*. This variable expresses what percentage of the utterances recorded for a given sentence type in a given Scandinavian variety shows downstep (where the pitch decrement between P_1 and P_2 is larger than 2 semitones). The second variable is the *mean size of the pitch decrement* between P_1 and P_2 , irrespective of whether the pitch decrement qualifies as a downstep or not (i.e. regardless of whether the semitone between two points is larger than 2 or not).

The incidence of downstep and the mean of the pitch decrement are computed by choosing two representative male and two representative female speakers in each of the Scandinavian varieties investigated. The F0 is computed for each utterance by using the autocorrelation method implemented in the Praat software. Reasonable upper and lower frequency bounds are set depending on the gender and vocal characteristics of the speaker. Each word is marked off by boundaries on a time-aligned annotation grid in Praat. Within each of the target words, the main verb and a particle, the F0 maximum is automatically found and extracted by the Praat software. The F0 values (in Hz) extracted at P_1 and P_2 are then converted to semitones and further processed with the SPSS statistical software.

The result of computation is given in Table 1. The incidence of downstep, which is given in the column *Downsteps > 2st (%)*, is extremely higher in East Swedish and Övdalian, 68.4% and 80.0% respectively, than in East Norwegian and East Danish, 45.0% and 6.25% respectively. The mean pitch decrement, which is given in the column *Mean decrement (st)*, is also larger in East Swedish and Övdalian, 2.75st and 3.48st respectively, than in East Norwegian and East Danish, 2.64st and -1.98st respectively. In East Danish, even upstep is likely to occur as shown by the minus value. This result confirms

the observation that the pitch is likely to lower sentence-finally in East Swedish and Övdalian but to rise in sentence-final position in East Norwegian and East Danish, in verb particle constructions.

Scandinavian Variety	Downsteps > 2st (%)	Mean decrement (st)
East Swedish	68.4	2.75
Övdalian	80.0	3.48
East Norwegian	45.0	2.64
East Danish	6.25	-1.98

Table 1: The incidence of downstep and the mean pitch decrement