



# Prosodic Variation in Particle Constructions in Three Norwegian Dialect Areas

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Particle verbs in Norwegian are often realized as one maximal prosodic word with main stress either on the verb or the particle, but sometimes the verb and the particle project their own maximal prosodic words. This article contains a prosodic analysis of particle verbs in the Nordic Dialect Corpus (Johannessen et al. 2009) from three dialect areas: Finnmark, Trøndelag and Buskerud. In all three areas there is a variation between at least four different accent realizations. A maximal prosodic word with the main stress on the verb, so-called compound accent, is the most common realization of particle verbs in the material, but this is also the most restricted realization; it is not possible when an accented word intervenes between verb and particle, and it requires a verb–particle structure. In addition, there are several probabilistic factors that affect the likelihood of a certain prosodic realization. Syntactic traits like surface constituency are ignored by the phonological grammar.

## 1 Introduction

It is well-known that the order between an object and a verbal particle (as in, e.g., *kaste ut* ‘throw out’) varies in Norwegian (e.g., Sandøy 1976, Svenonius 1996, 2003, Toivonen 2003, Hróarsdóttir 2008, Larsson & Lundquist 2014, Lundquist 2014, Aa 2015, 2020). Pronominal objects precede the particle, whereas non-pronominal objects can either precede or follow the particle, as illustrated in (1). There is some dialectal variation; for instance, Trøndersk tends to have pronouns following particles to a higher extent than other dialects (e.g., Larsson & Lundquist 2014). The word order variability illustrated in (1) is a good diagnostic for identifying transitive verb–particle combinations in Norwegian.

- (1) a. *Vi kastet hunden/den ut.*  
 we threw dog.DEF/it out
- b. *Vi kastet ut hunden/den.*  
 we threw out dog.DEF/it  
 ‘We threw the dog/it out.’

As noted by, e.g., Sandøy (1976), Kristoffersen (2000), Aa (2015, 2020), and Tengesdal & Lundquist (2021), there is also variation in the prosodic realization of the verb–particle construction. First, the verb can be de-accented and the particle accented; in the following, we refer to this as *particle accent*. Second, the verb and particle can be realized with *compound accent*. Moreover, there are cases when both the verb and the particle are accented; we refer to this as verb + particle accent or *double accent*. Finally, there are cases when neither verb nor particle carry accent (*no accent*). The variation between these realizations is found within dialects, even within speakers.

This variation in prosodic realization is, as far as we know, unique to particle verbs. The dialects that exhibit variation between particle stress (*ta ÚT* ‘take out’) and compound stress (*TÁ út* ‘take out’), do not show similar variation in compounds: compounds almost always have stress on the first element. Similarly, frequently used semi-lexicalized phrases like *kjøpe hus* (‘buy house’), *kjøre bil* (‘drive car’) and *første mai* (‘First of May’) are typically realized with a deaccented first element, just like particle verbs with particle accent, but they never have compound accent. More generally, compound accent is otherwise restricted to words, and not found in phrases (possibly with a small set of exceptions). Particle verbs with compound accent thus have prosodic properties similar to words. They also often have a lexicalized (non-compositional) meaning, i.e., it is not possible to fully understand the meaning of the particle verb based on the semantics of the verb and the particle independently, e.g., *gi ut* (‘publish’, lit. ‘give out’), *skrive opp* (‘write up’, ‘take note’). Despite their “lexical” prosodic and semantic properties, the verb and the particle behave syntactically as independent words (Åfarli 1985): as we saw in (1a), an object pronoun or full noun phrase can intervene between the verb and the particle. In contexts where the verb is realized in the second position of the clause (V2), the particle always remains inside the verb phrase, as can be diagnosed by intervening subject pronouns and sentence adverbs, as in (2); the order *tok ut han jo bilen* is ungrammatical.

- (2) [<sub>CP</sub>I går <sup>2</sup>(*'tok* [<sub>TP</sub>han jo [<sub>VP</sub>, *ut*) bilen]]]  
 y.day took he ADV out car.DEF  
 ‘Yesterday, he (indeed) took out the car.’

Even in the contexts where the verb and particle do not make up an obvious syntactic phrase, we can observe prosodic variation, and all the four accent patterns occur. This raises questions about the relationship between syntactic structure and prosodic structure. In the following, we build on prosodic theories where the “one accent” realization found in particle accent and compound accent is a diagnostic of a prosodic word (Riad 2014). That is, when the verb–particle combination shares one accent, it constitutes one prosodic word. The question is then if there are *syntactic* restrictions on what may constitute a prosodic word, or if the restrictions on prosodic wordhood can fully be explained in terms of linear order, lexical stress specification and information structure. A related question is if there are different restrictions on right-headed prosodic words (i.e., particle stress) and left-headed prosodic words (i.e., compound stress).

In this study, we investigate some of the conditions for the prosodic variation in verb–particle constructions, using corpus data from three different dialect areas: Buskerud in Eastern Norway, Trøndelag, and Finnmark in the north. The aim is to provide an overview of the distribution of the different prosodic realizations in these dialects, and to shed light on the underlying factors that determine the variation. The present study should be seen as a first step toward a better understanding of the interplay between syntax, prosody and the lexicon in particle constructions; a full discussion requires more detailed investigation of the phonology of the different dialects than we can present here, as well as additional discussion of the syntax of particle constructions.

The paper is organized as follows. Section 2 gives a description of the prosodic patterns in the relevant dialects. Section 3 describes the method and the data set; and Section 4 presents the results. As we will see, the prosodic realization depends, among other things, on word order (in particular, what elements intervene between verb and particle) as well as geographical area. Section 5 provides a discussion of the prosodic, syntactic, lexical and semantic factors that are (or are not) involved in the variation. Section 6 is a conclusion.

## 2 Prosody in Norwegian particle constructions: the general patterns

In this section, we describe the four general prosodic patterns that we find in Norwegian verb–particle constructions. For background, theoretical assumptions are presented in 2.1, where we also provide some key prosodic features of the dialects from the three areas to be investigated. A taxonomy of the four patterns is provided in 2.2. We illustrate the four patterns both in terms of the abstract prosodic structure and with annotated authentic speech recordings from our study.

### 2.1 *Theoretical assumptions and prosodic characteristics of the dialects from the three areas*

In the prosodic description, we largely use the prosodic hierarchy of Swedish suggested by Myrberg & Riad (2015) as a reference point.<sup>1</sup> In this model, there are three categories above the foot: the prosodic word ( $\omega$ ), the phonological phrase ( $\varphi$ ), and the intonation phrase ( $\iota$ ). Ideally, these prosodic categories should correspond directly to the morphosyntactic categories of a morphosyntactic word ( $\omega$ ), a syntactic phrase ( $\varphi$ ), and a clause ( $\iota$ ) (Selkirk 2009, 2011, Ito & Mester 2012), but mismatches between prosodic and syntactic categories are well-known (and potentially handled within an Optimality Theory framework, where MATCH constraints can be violated by other higher ranked constraints).

With Myrberg & Riad (2015), we assume a recursive  $\omega$  in Norwegian (as in Swedish), which clearly shows a distinction between two levels. Both levels share the defining property of having one phonological prominence each (*culminativity*). The defining characteristic of the minimal prosodic word ( $\omega^{\text{min}}$ ) is the presence of one stress. The maximal prosodic word ( $\omega^{\text{max}}$ ) is defined by the presence of one primary stress and one accent (either small or big accent;<sup>2</sup> but it may contain multiple lexically

1. The choice of model is partly motivated by the fact that we are interested in the underlying structural relationship between verb and particle and how it relates to the prosodic realization. As we will see in Section 2.2, this will give us a structural parallelism between particle accent and compound accent, where the four realizations are comparable at the abstract level of the  $\omega^{\text{max}}$  (headedness). However, as noted by an anonymous reviewer, an analysis in terms of the Trondheim model (Nilsen 1992) is also possible. Both models face challenges in the analysis of particle constructions, albeit of different kinds. A comparison between the two models would lead too far afield.
2. Small and big accents are two accent types that belong to separate phonological

stressed syllables; see Myrberg 2021: 24). Since verb–particle constructions realized with compound accent or particle accent have only one primary stress and one accent, they should be characterized as maximal prosodic words. In simplex words,  $\omega^{\min}$  and  $\omega^{\max}$  are coextensive ( $\omega^{\min=\max}$ ). Simplex forms thus receive one stress and one accent. In words with multiple stressed syllables,  $\omega^{\max}$  is complex and encompasses all  $\omega^{\min}$ s ( $\omega^{\min\neq\max}$ ); the leftmost stressed syllable has the primary stress (Myrberg 2022: 101). In Section 2.2.1, we look at maximal prosodic words where the primary stress falls on the rightmost stressed syllable: particle verbs with particle accent.

Tone accents associate with stressed syllables in Norwegian (cf., e.g., Kristoffersen 2000: 240). Accents consist of multiple H or L tones, one of which is associated with the primary stress of a word (Kristoffersen 2000: 240, Myrberg 2022: 101). The dialects of the three areas in the present study belong to two different types in the Scandinavian tone accent typology (see, among others, Gårding 1977, Bruce 1977, 2007, 2010, Fintoft et al. 1978, Mjaavatn 1978, Lorentz 1995, Riad 2006, 2014, 2018). In Finnmark, the lexical tone on the stressed syllable in tone accent 2 is low (L), whereas Buskerud and Trøndelag have a high (H) lexical tone. In Buskerud and Trøndersk, (postlexical) accent 2 is the rule in compounds (Riad 2006: 40). Moreover, these two dialect types are *two-peaked* (the tonal contour in tone accent 2 has two tonal peaks), and the peaks are late aligned (Myrberg 2022: 95). Finnmark lacks the tone accent distinction (Kristoffersen 2000: 234).

## 2.2 The four accent patterns

This study employs a taxonomy consisting of four prosodic patterns that are relevant for the analysis of particle verbs. We adopt the terminology *particle accent*, *compound accent* (*compound stress* in Kristoffersen 2000: 181–200), *double accent* and *no accent*. The phonetic realizations vary de-

prominence categories. They are not tied to the melodic shape of the accents (e.g., HL-accent or HLH-accent). Rather, they generally differ both in terms of scaling (small accents have smaller fundamental frequency ( $f_0$ ) excursions than big accents) and perception (small accents are perceptually less prominent than big accents). In previous research, these two intonational categories have been referred to as (*word*) *accent* and (*sentence*) *accent* or *focal accent*, respectively (see Myrberg & Riad 2015: 117–118).  $\omega^{\max}$  contains one and only one small accent, or, by projection of the  $\omega^{\max}$  to head of  $\varphi$ , one big accent (Myrberg 2021: 5).

pending on the variety and individual in question, but the realizations are comparable at the abstract level of the  $\omega^{\max}$  (headedness). In other words, our study to a great extent refers to the  $\omega^{\max}$  level in the prosodic analysis; as we will see further below, the realizations differ with respect to headedness (left- or right-headed) and complexity (incorporated verb and particle or not).

Observe that we do not claim that any of the four prosodic structures are exclusive to particle verbs. On the contrary, there are several constructions with corresponding structures. Particle accent ( $^0g\ddot{a} \ ^1u[:]t$  ‘go out’) is prosodically similar to the stress placement in for instance loanwords ( $ba^1na[:]n$  ‘banana’;  $tele^1fo[:]n$  ‘telephone’), given names ( $^0Anne \ ^2Li[:]se$ ) and other lexicalized phrases ( $^0k\ddot{o}yra \ ^1bi[:]l$  lit. ‘drive car’). On the other hand, compound accent in particle constructions ( $^2g\ddot{a}[:],u[:]t$ ) is prosodically similar to the dialectal forms of loanwords ( $^2ba,n[:]a[:]n$ ;  $^2tel[:]e,fo[:]n$ ) and morphological compounds ( $^2to[:]ne,fall$  ‘accent’;  $^2svart,hesten$  ‘black horse.DEF’), where the primary stress placement is initial (see Tengesdal & Lundquist 2021 for some discussion). In some varieties, like those in Finnmark, compound accent can be found even in given names ( $^1Anne, Lise$ ) and related phrases ( $^1onkel, Jakob$  ‘Uncle Jacob’).

In the following subsections, the prosodic patterns are exemplified in prosodic trees with the sentence *Læraren gjekk ut i hagen* ‘The teacher went out in the garden’. For simplicity, only projections up to  $\omega^{\max}$  are provided.<sup>3</sup> Each pattern is also illustrated with annotated corpus speech recordings.<sup>4,5</sup>

### 2.2.1 Particle accent

Figure 1 shows the prosodic tree for particle accent. The particle verb is prosodically right-headed, that is, the particle’s prosodic word projects both stress and accent, while the verb retains its stress but is deaccented. Following Riad (2014: 270), we analyze this as an instance in which the

3. We use diacritical marks to indicate realized tone accent ( $^{1*}$  or  $^{2*}$ ), deaccented verb ( $^{0*}$ ), and stress placement (primary stress:  $^{\prime}$ ; secondary stress:  $^{\cdot}$ ) in many of the examples. In varieties that lack tone accent distinction (Finnmark), some words that would otherwise have had tone accent 2 are in the following marked with the combining diacritical mark ‘ $\text{̥}$ ’ on the stressed syllable’s vowel. In the tonal varieties, expected accent 2 realization is marked word-finally with  $^{\cdot}_2$ .
4. The Norwegian transcriptions in the figures are given in the *Bokmål* standard of Norwegian.
5. Additional figures and more can be found in the *Supplementary Files*: [ojs.novus.no]

unaccented prosodic word incorporates into a maximal prosodic word nearby. This general prosodic pattern might also be called ‘phrasal accent’. The PP *i hagen* ‘in the garden’ is also right-headed and exhibits phrase-final accent, however, the preposition *i* ‘in’ is an unaccented and unstressed syllable, yielding an adjoined prosodic word (Riad 2014: 130).

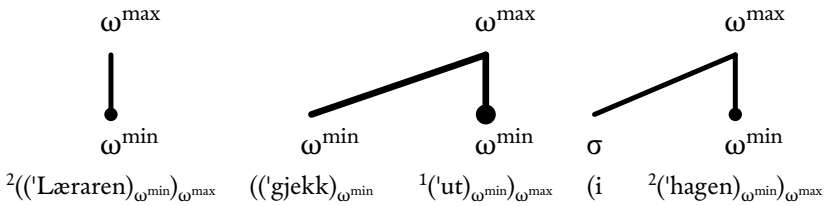


Figure 1: Prosodic tree of *particle accent*. Right-headed (particle)  $\omega^{\max}$ . The thick line with a dotted base refers to the prosodic head of a  $\omega^{\max}$ /non- $\omega^{\min}$ . The particle verb *gje:kk ut* is highlighted with thicker lines.

Figure 2 illustrates particle accent in the two-peaked Buskerud variety of Flå, with the particle verb  $^0slo$   $^1inn$  ‘drove in’. In this variety, accent 1 words have an  $f_0$  pattern consistent with L\*H, and accent 2 words are consistent with H\*LH tonal targets. Compare the shape of the particle  $^1inn$  ‘in’ and  $^1stokken$  ‘the log’ with  $^2m\ddot{a}le_{,stav_2}$  ‘measuring rod’ (compound) and  $^2farge_2$  ‘color, dye’ (simplex). There is a clear  $f_0$  rise on the particle. If the particle verb had instead been realized with compound accent (i.e.,  $^2slo_{,inn}$ ), we would have expected to see an H\*L contour on the verb *slo*, then H on the particle *inn*, as in  $^2m\ddot{a}le_{,stav_2}$ .

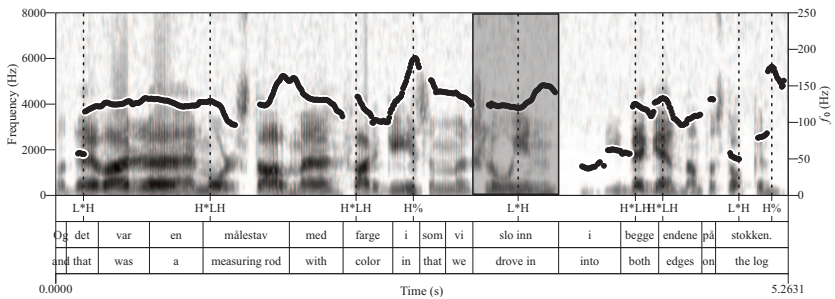


Figure 2: Buskerud, flaa\_ma\_o2 (older man). ‘And that was a measuring rod containing dye, that we drove in into both edges of the log.’ Particle accent in  $^0slo$   $^1inn$  ‘drove in’, see the accent 1 L\*H contour on the particle.

Figure 3 shows particle accent in the one-peaked Finnmark variety of Kjøllefjord, exemplified with the particle verb *⁰gå 'inn* ‘enter’. There is an accent on the particle *'inn* ‘in’, as indicated by the  $f_0$  fall, consistent with H\*L. There is no accent distinction in this variety; there is therefore no accent 2 L\*HL contour on the word *'inni* ‘inside’, which we would expect in one-peaked varieties with an accent distinction. Instead, there is an  $f_0$  fall both in *'inn* and *'inni*, compatible with an H\*L contour; we analyze this as a phonetic reflex of an accent (consisting of a prominence tone (H) on the primary stress, and a boundary tone (L)); cf. Riad 2006: 42–43).

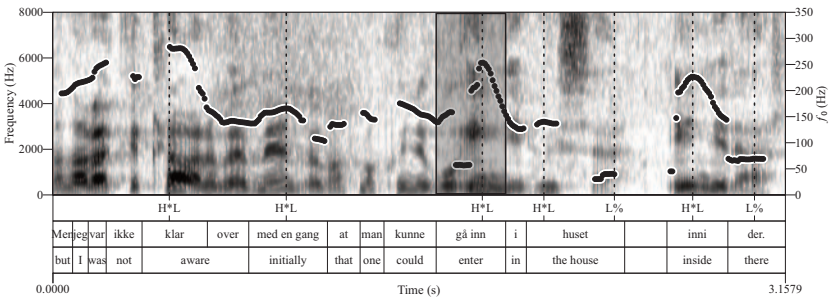


Figure 3: Finnmark, kjoellefjord\_04gk. ‘But I was not aware, initially, that one could enter the house, inside there.’ Particle accent on *⁰gå 'inn* ‘enter’, see the H\*L contour on the particle.

2.2.2 Compound accent

Figure 4 illustrates the prosodic tree for compound accent. The morpho-syntactically complex (i.e., phrasal) particle verb is realized as a left-headed prosodic compound, i.e., the verb bears primary stress and accent, while the particle gets secondary stress (Riad 2014: 132).<sup>6</sup> The initial primary stress and obligatory postlexical accent 2 (even if the verb or particle in isolation would have accent 1; see Kristoffersen 2000: 288 on ‘accent shift’) serve as diagnostics for compound accent in the dialects with a tone accent distinction. In Figure 4, we indicate a postlexical accent 2 on the verb and particle.

6. As pointed out by an anonymous reviewer, *compound accent* is not an ideal term, as compounds may have different accent patterns in Norwegian. We use the term to refer to left-headed complex words.



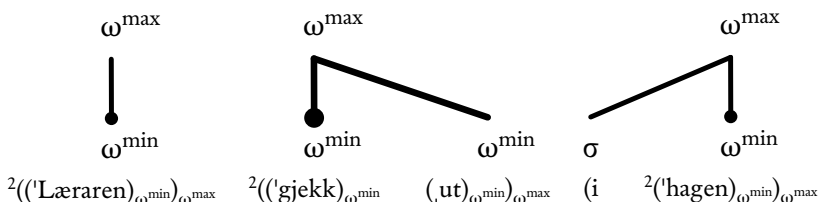


Figure 4: Prosodic tree of *compound accent*. Left-headed (verb)  $\omega^{\max}$ .

Figure 5 illustrates a compound accent in an example from Meråker in Trøndelag; the particle verbs are <sup>2</sup>*luke<sub>2</sub>,ut* ‘weed out’ and <sup>2</sup>*ta,ut* ‘take out’. The utterance contains four accent 2 words (the inflected adjective <sup>2</sup>*flinkere<sub>2</sub>* ‘better’, the compound <sup>2</sup>*skade,dyra<sub>2</sub>* ‘the pests’, and the two particle verbs), and it is clear that the accent 2 H\*LH tonal contours are the same. If the first particle verb had been realized with particle accent (<sup>0</sup>*luke<sub>2</sub> <sup>1</sup>ut*), we would not have seen the H\*LH contour on the verb *luke<sub>2</sub>* in Figure 5, but accent 1 L\*H contours on both particles.

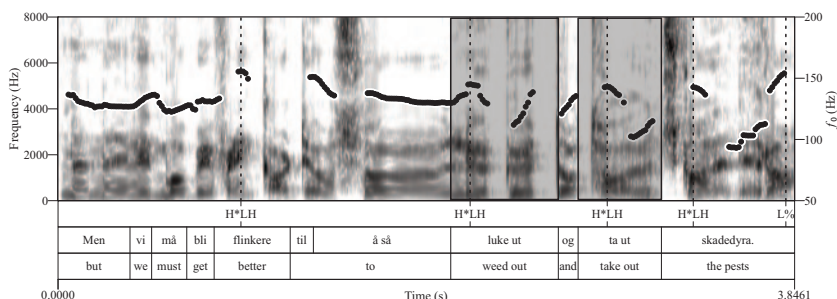


Figure 5: Trøndelag, *meraaker\_o3gm*. ‘But we must improve our skills in weeding out and eradicating the pests.’ Compound accent on <sup>2</sup>*luke<sub>2</sub>,ut* ‘weed out’ and <sup>2</sup>*ta,ut* ‘take out’, see the accent 2 H\*LH contours spanning respective verbs and particles, cf. the accent 2 contour in the morphological compound <sup>2</sup>*skade,dyra<sub>2</sub>* ‘the pests’.

In Finnmark, compound accent has been identified in examples with primary stress on the verb and secondary stress on the particle; in some cases, only the verb has a clear accent (cf. Section 3.3 below). Figure 6 illustrates compound accent in Kjøllefjord in Finnmark, with the particle verb <sup>1</sup>*trådte, ned* ‘stepped down’. In this utterance, the particle verb is

aurally quite prominent, but there is an even more prominent tonal contour in the final  $\omega^{\max}$  (*kjēnte, ikke, det* 'did not feel it'). The particle verb accent H\*L contour is timed at the end of the primary stressed syllable of the verb *trādte* 'stepped'. Compare with the particle verb *gā 'inn* in Figure 3 (also Kjøllefjord), in which the particle *'inn* (and not the verb) bears the accent H\*L; the particle verb in Figure 6 is left-headed, whereas the example in Figure 3 is right-headed.

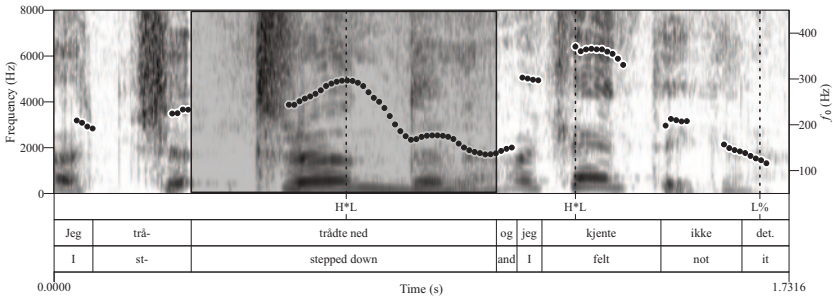


Figure 6: Finnmark, kjoellefjord\_o3gm. 'I st- stepped down, and I did not feel it.' Compound accent on *'trådte, ned* 'stepped down', see the accent H\*L contour spanning the verb and particle.

### 2.2.3 Double accent

In contrast to the two previous prosodic patterns, the double accent category illustrated in Figure 7 involves instances in which the verb and the particle each project stress and accent, and thus head their own separate maximal prosodic words. Any intervening elements will either be prosodically incorporated into some host, as in the case of unaccented and unstressed pronouns, or head their own  $\omega^{\max}$ .

The example in Figure 8 is produced by a speaker from Kirkenes in Finnmark; it has two adjacent particle verbs *'dro 'frem* 'pulled out' and *'kom 'inn* 'came in', both with double accent, as is evidenced by the accent H\*L contours on all the verbs and particles. Double accent can be distinguished from particle accent (*°dro 'frem* and *°kom 'inn*) in that the verbs *'dro* and *'kom* have clear accent contours here (cf. Figure 3, Kjøllefjord, Finnmark), and from compound accent (*'dro, frem* and *'kom, inn*) in that the particles *'frem* and *'inn* also have clear accent contours. There is no tone accent opposition in this dialect.

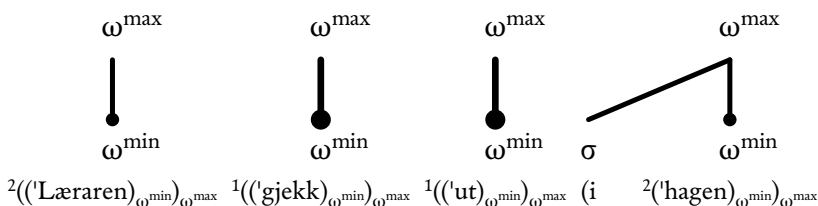


Figure 7: Prosodic tree of *double accent*. Verb and particle head their own  $\omega^{\max}$ .

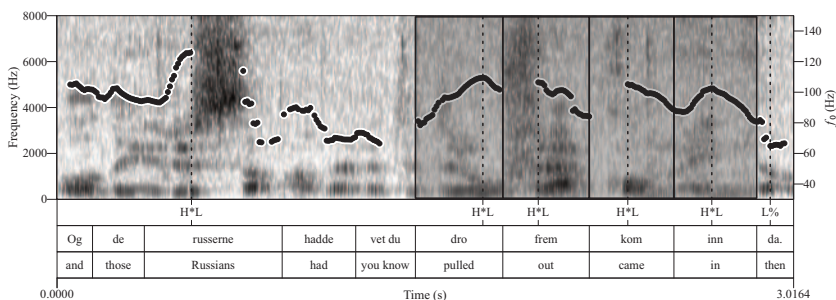


Figure 8: Finnmark, kirkenes\_03gm. ‘And those Russians had, you know, pulled out, came in, then.’ Double accent on ‘dro’ ‘frem’ ‘pulled out’ and ‘kom’ ‘inn’ ‘came in’, see the accent H\*L contours on all the involved words.

### 2.3.4 No accent

Figure 9 illustrates the pattern termed *no accent*, in which neither the verb nor the particle is realized with accent. Instead, they prosodically incorporate into the following  $\omega^{\max}$ , similarly to the prosodic adjunction in the PP *i hagen* ‘in the garden’. There is a reduction, and the stresses might not always be audible.

Figure 10 shows an example of no accent in Flå, Buskerud, in the particle verb  ${}^0satt\ {}^0inn$  ‘deployed’. Here, compound accent would have had a tone accent 2 H\*LH contour ( ${}^2satt,inn$ ) like the ones we attest in  ${}^2ofte_2$  ‘often’ and  ${}^2krefter_2$  ‘forces’, but there is no clear evidence for this, neither aurally nor with reference to the  $f_0$ . Neither is it a case of particle accent, with a deaccented verb and a tone accent 1 L\*H contour on the particle ( ${}^0satt\ {}^1inn$ ).

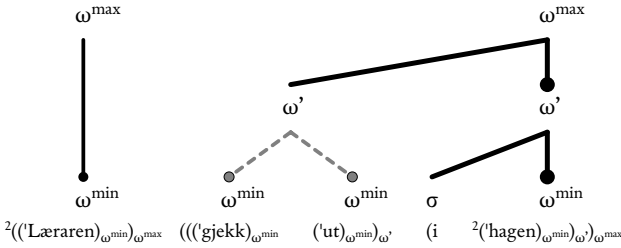


Figure 9: Prosodic tree of *no accent*. Neither verb nor particle heads their own  $\omega^{\max}$ .

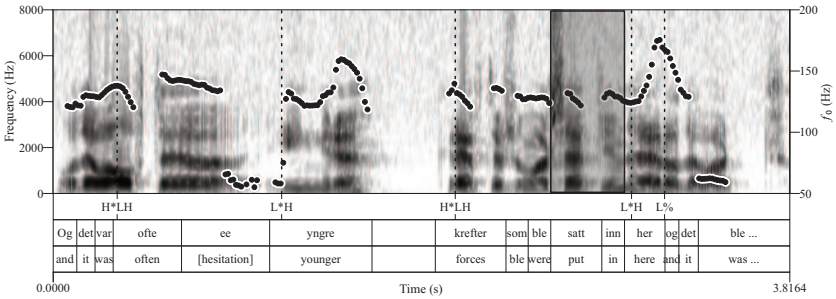


Figure 10: Buskerud, flaa\_ma\_02. ‘And it was often younger forces that were deployed here, and it was...’ No accent on  $^0satt^0inn$  ‘deployed’. In the immediate surroundings, both  $^2krefter_2$  ‘forces’ and  $^1her$  ‘here’ have accents, as indicated with accent 2 H\*LH contour and accent 1 L\*H contour.

### 3 Method and data set

In this section, we describe the data set and annotation. The study uses data from the Nordic Dialect Corpus (NDC, Johannessen et al. 2009). We have first accessed the transcriptions through the corpus interface, manually analyzed the hits to define a data set, and then extracted the audio files. Section 3.1 describes the data set as defined through the transcriptions. Section 3.2 describes the lexical, syntactic and semantic annotation of the transcriptions. In Section 3.3, we turn to the prosodic annotation.

#### 3.1 Data set

The present study uses the spontaneous speech data in NDC. Using the corpus interface, we searched for the four particles *opp* ‘up’, *ned* ‘down’,

*inn* ‘in’, and *ut* ‘out’ in different locations in Finnmark (mainly coastal Finnmark), Trøndelag (mainly what was previously known as Nord-Trøndelag), and Buskerud; see Table 1 for a complete list of locations.<sup>7</sup> These areas were chosen partly because they show different word order patterns: Buskerud (East Norwegian) has pronominal objects before particles, but generally places NP objects after particles; Finnmark looks much like Buskerud with respect to word order, but has a higher number of NPs before particles; Trøndersk allows the order particle–pronoun to a higher extent than other dialects (see Larsson & Lundquist 2014). The dialects are also chosen because they have different prosodic systems. As we saw in Section 2 above, Finnmark has a high-tone shape and no tone accent distinction, whereas Buskerud and Trøndelag have the East Norwegian two-peak pattern.

The results were annotated manually, and irrelevant hits excluded. First, we have only included cases where *opp/ned/inn/ut* are used with a verb to form a particle construction; other examples of the adverbs are excluded (e.g., *de for dit ned* ‘they went down there’, *født inn på Mårøya* ‘born in M.’, *være med oss ut* lit. ‘be with us out’). In transitive constructions, we have used word order variability between object and particle (as illustrated in (1) above) as a diagnostic for verbal particles; e.g., *stakk meg opp i øret* ‘stung me in the ear’ has been excluded, since the word order is fixed (even with an NP object). With intransitive verbs, it is straightforward to identify verb–particle combinations that have a non-transparent (non-directional) meaning, like *vokse opp* ‘grow up’. Directional verbs with *opp/ned/inn/ut* can be much harder to categorize. In these cases, we have been liberal as to what we treat as particles; this means that some of the cases that are included here should perhaps rather be analyzed as involving a verb and an adverbial modifier (consider, e.g., *kjøre ut* ‘drive out’ or *komme inn i huset* ‘come (in) into the house’, where two different analyses are possible). Since we have annotated for syntax and semantics (Section 3.2 below), we will be able to see if these cases behave prosodically like particle verbs or not. Coordinated particles (*springe inn og ut* ‘run in and out’) have been excluded. Furthermore, we have excluded cases where an adjective intervenes between verb and particle, as in the more or less fixed constructions *høres/ser ADJ ut*

7. The counties of Norway changed substantially on 1 January 2020, but we retain the older division which is used in the corpus.

‘looks/sounds ADJ’. In this construction, the adjective always carries the main stress while the particle *ut* is deaccented. The verb may or may not carry an accent, but we never find something similar to a compound accent spanning verb and adjective. (See Larsson & Lundquist 2022, and references therein for discussion on what characterizes verb particles and how they can be identified in corpora.)

A summary of the locations and number of included items is given in Table 1. In total, the investigation included 885 utterances with particles. Out of the particles, *opp* was the most common (37.1%,  $n = 328$ ), followed by *ut* (32.7%,  $n = 290$ ) and *inn* (19.1%,  $n = 169$ ). *Ned* was the least common (11.1%,  $n = 98$ ).

Table 1: Overview of the data set.

Area	Locations	Particle distribution (n)	Total number of items (n)
Buskerud	Darbu, Flå, Hole, Rollag, Ål	<i>opp</i> : 94 (32.9%); <i>ut</i> : 84 (29.4%); <i>inn</i> : 71 (24.8%); <i>ned</i> : 37 (12.9%)	286 (32.3%)
Trøndelag	Bjugn, Inderøy, Lierne, Meråker, Namdalen	<i>opp</i> : 138 (44.2%); <i>ut</i> : 102 (32.7%); <i>inn</i> : 51 (16.3%); <i>ned</i> : 21 (6.7%)	312 (35.3%)
Finmark	Hammerfest, Kirkenes, Kjøllefjord, Vardø	<i>ut</i> : 104 (36.2%); <i>opp</i> : 96 (33.4%); <i>inn</i> : 47 (16.4%); <i>ned</i> : 40 (13.9%)	287 (32.4%)
<b>Total</b>			885

### 3.2 Annotation of lexical, syntactic and semantic factors

The data set includes cases with an auxiliary verb and particle, without a lexical main verb; see (3). The verbs in the data set have been annotated for finiteness (finite/non-finite) and type (modal verbs, auxiliaries, and main verbs), so the modal cases could be easily distinguished.

- (3) jeg må ut (kirkenes\_01um; modal verb)  
 I must out  
 ‘I must go out.’

In constructions with both a finite auxiliary and a non-finite main verb, the annotation gives the form of the main verb. In addition, the annotation includes the number of syllables of the verb; this is based on the

phonetic transcription available in the corpus. The annotation also includes the position of the main verb (or the modal in examples like (3) above). In main clauses (and certain embedded clauses; see Julien 2015, 2020) without an auxiliary, the main verb is in V2 position, and therefore precedes sentence adverbs and a non-initial subject, as in (4). In embedded clauses and main clauses with an auxiliary, the main verb remains *in situ* in the VP, as in the examples in (5).

- (4) da fant jeg jo ut det at... (rollag\_01um, main verb in V2 position)  
 then found I MOD out it that...  
 ‘then I found out that...’
- (5) a. så det ble plukket ut (darbu\_03gm, main verb in VP)  
 so it was picked out  
 ‘so it was picked out’
- b. de som # flytter inn her da (darbu\_04gk, main verb in VP)  
 they that move in here then  
 ‘they who move in here then’

Since we are interested in what elements intervene between the verb and the particle, we have added information about number and type of intervening elements in the annotation. First, we have noted the number of words intervening between verb and particle; here, *word* is used in the orthographic sense that is used in the transcription (where clitics are treated as orthographic words). Second, we have specified the syntactic function of the words (e.g., subject, object, sentence adverb). In (4) above (*fant jeg jo ut*), two words intervene, one subject pronoun (*jeg*) and one sentence adverb (*jo*). In (5a) (*plukket ut*) and (5b) (*flytter inn*), there are no intervening words. Third, the form of the interveners has been noted (e.g., pronoun, NP). Expletives, reflexives and the generic *man/en* ‘one’ have been treated as pronouns; they are always deaccented. Demonstratives and quantifiers like *noen* ‘some’ have been included among the NPs (although *noen* has a weak form).

Furthermore, we made a rough semantic annotation of the verb–particle semantics. Generally, the particle introduces a telos to the event specified by the verb (e.g., *gå ut* ‘go out’), or modifies a telos provided by the verb (e.g., *finne ut* ‘find out’). We distinguish between directional semantics (e.g., *komme inn* ‘come in’) and non-directional (often non-transparent

ent) semantics (e.g., *skrive ut* ‘print’, lit. ‘write out’). The directional verb particles are sometimes combined with a directional PP; cf. (6) below. The presence of a PP has been noted in the annotation.

- (6) a. skal vi gå inn og se der? (kjoellefjord\_03gm; directional particle)  
 shall we go in and see there  
 ‘Shall we go in and see there?’
- b. at man kunne gå inn i huset (kjoellefjord\_04gk; Dir+PP)  
 that one could go in in house.DEF  
 ‘that one could enter the house.’

### 3.3 Prosodic analysis

Using the sound files extracted from the corpus, the data set was annotated with respect to prosody.<sup>8</sup> Due to the scope of our study, and the fact that we investigated non-elicited speech in (semi-)uncontrolled situations, our acoustic analysis was qualitative and limited to observing the  $f_0$  in conjunction with aural analysis and making an informed determination in light of both phonetic and prosodic/phonological considerations. Technically, the annotation was conducted using the free software *Praat* (Boersma & Weenink 1992–2022), assisted by two scripts.<sup>9</sup>

39 unclear cases were excluded from the descriptive statistical analysis. This can for instance involve cases where background noise, creaky voice phonation and other non-modal voice laryngeal settings, considerable speech laughter (see, e.g., Dunbar 2014), overlapping speech, uninterpretable speech, speech disfluencies and restarts, lead to impossible or highly unclear categorization.

Author 1 judged each verb–particle utterance primarily in terms of presence and type of tone accent(-s) and stress. In the two-peaked dialects (Buskerud and Trøndelag), this meant identifying a rise (L\*H) in accent

8. We were granted access to the analyzed audio files, as well as the transcription/transliteration files, by the Text Laboratory, ILN, UiO. The audio files were all encoded in the WAV format.
9. Author 1, a native speaker of Norwegian – but not of the varieties studied – conducted the aural and acoustic analysis. All utterances were checked at least twice. High-quality headphones and/or earbuds were employed to increase the reliability of the categorization (Bose QuietComfort 35 noise cancelling headphones; Jabra Elite Active 75t earbuds with an ‘Active Noise Cancellation’ feature).



1 words, and two peaks in accent 2 words (H\*LH). We assume a *peak delay* phenomenon, i.e., that a tonal target like L\* or H\* might phonetically be realized/associated considerably later, sometimes well into the following unstressed syllable (for discussion, see, e.g., Kristoffersen 2006: 109 and references therein, and Hognestad 2012). More importantly, there can be drifting of a right-aligned H boundary tone in nuclear accents in East Norwegian (see Fretheim 1987, Nilsen 1992, Kristoffersen 2000: 278). Indeed, we have attested several examples of this phenomenon, typically in the case of compound accent with some unaccented element following the particle. Our categorization is primarily oriented towards the headedness status and, in the case of compound accent and double accent, the left but not right edge of  $\omega^{\max}$ . Drifting does not affect the analysis and generalizations and has therefore been excluded as a separate factor. We have also assumed default right-headed nuclear accent on the right-most phonological phrase in an intonation phrase (Myrberg & Riad 2015: 136). We did not categorize the data with respect to small and big accents based on phonological status, nor with respect to perceived degree of prominence (see Myrberg 2021: 13 and references therein for a discussion of the problematic relationship between perception and (gradient) prominence), but all items are likely categorizable as either big or small accents within the prosodic hierarchy framework, or as focal or non-focal Accent Phrases/Tonal Feet (Fretheim & Nilsen 1991, Kristoffersen 2000: 279).

In many cases, the identification of accent presence and accent type was clear; this is especially true for compound accent (i.e., a postlexical accent 2 spanning both the verb and particle as a left-headed  $\omega^{\max}$  and phonetic features indicative of secondary stress, like duration and vowel quality). However, since the data set consists of semi-spontaneous speech, it is not unexpected that there were cases which were somewhat unclear as to the prosodic categorization, but where one category is the most likely. Since these unclear cases are not completely random, we have chosen to include them in the results, and treat them together with the most likely category (see further Footnote 10 below for details); we believe that leaving them out would skew the data more than including them.

In the two-peaked varieties, there are cases when there is no clear pitch fall on the primary stressed syllable of the verb (which is expected with compound accent), but instead a pitch floor which could be analyzed

either as a deaccented verb syllable (i.e., particle accent) or accented verb syllable (compound accent). Another difficult case is when there is no clearly demarcated pitch rise (L\*H contour) on the particle syllable (with particle accent) as expected in words with accent 1.

One-peaked dialects of Finnmark lack the tone accent opposition, and we therefore identified a fall (H\*L) associated with the primary stressed syllable of the accented words. *Prima facie*, this entails a prosodically less complex system, where differentiating clear members of particle accent and compound accent is uncomplicated. However, in unclear cases, it is more difficult to select either of the two as more likely than the other, as compared to the other dialects, where additional properties like tone accent (e.g., postlexical accent 2 suggests compound accent) might serve to guide the categorization.

In all three dialect types, the category *no accent* is uncomplicated in cases directly before and/or after a highly marked prosodic constituent (as in contrastively focused elements; nuclear big accent) – thus predictably deaccented. In some cases, other indicators of primary stress/accident status (like vowel quality, duration, preaspiration or preaffrication, if any) can serve as an additional source aiding category differentiation.

In the description so far, we have assumed that the verb and particle belong to the same prosodic word in the cases of compound accent, particle accent and no accent. However, this is not always the case. For example, when a noun or an accented adverb intervenes between the verb and the particle, either the verb or the particle (or both) may be deaccented. In a sentence like *I går gjekk Ole ut i hagen* ('Yesterday went Ole out in the garden'), the proper noun *Ole* always carries its own accent. If the verb is deaccented and the particle accented, the verb and particle will not be part of the same prosodic word; the deaccented verb will most likely be incorporated into the noun, and the particle will be realized as a separate prosodic word:  $(I \text{ } ^1(\text{'gâr}))_{\omega}^{\max} (\text{gje}kk \text{ } ^2(\text{'Ole}))_{\omega}^{\max} \text{ } ^1(\text{'ut})_{\omega}^{\max} (\text{i } ^2(\text{'hagen}))_{\omega}^{\max}$ . We have still labeled these cases as particle accent, as the verb is deaccented and the particle accented.

Cases where left-headed  $\omega^{\max}$ s appeared to have verb accent 1 and a destressed particle rather than postlexical accent 2 were annotated as a subtype of the compound accent pattern. In Finnmark, we have encountered a few problematic cases where accented words intervene between an accented verb and a deaccented particle. Here, the particle does not incorporate into the verb's maximal prosodic word, but typically into

the intervening accented word. Given the tonal properties of the Finnmark dialects, these cases initially sound like compound accent, even though it is clear that the strings consisting of the verb, the following accented word(-s) and the particle, do not form a single maximal prosodic word. We have still labeled these few cases as compound accent, as the verb is accented and the particle deaccented, and discuss them further in Section 5.1.

## 4 Results

In this section, we present the results from all three dialect areas. Section 4.1 gives the overall results. Section 4.2 is concerned with the relationship between prosodic category and word order, and Section 4.3 considers the syntactic position of the verb and the function of intervening elements. Section 4.4 briefly investigates the correlation between prosody and semantics or verb type. Section 4.5 is concerned with the syllable structure of the verb.

### 4.1 Overview

Table 2 gives an overview of the results, including the cases that were hard to categorize.<sup>10</sup> Out of a total of 885 examples, 621 (70%) have one accent spanning the verb and the particle. Of these, 172 (27.7%) are right-headed (particle accent), and 449 (72.3%) left-headed (compound accent). Out of the whole data set, 154 (17.4%) have double accent, and 110 (12.4%) have no accent.

10. As mentioned in Section 3.3, the data include a number of unclear cases that do not clearly belong to one category (328 altogether). Since the unclear cases are to some extent systematic (e.g., considering compound accent in Finnmark, and difficulty clearly identifying *no accent*), they have been included and are sorted according to the most likely category. The category *particle accent* includes 44 unclear cases (8 from Trøndelag, 15 from Buskerud, 21 from Finnmark). Compound accent includes 159 somewhat unclear cases of which 42 are from Trøndelag, 60 from Buskerud and 57 from Finnmark. There are 47 unclear cases of double accent, 27 of which from Buskerud, 16 from Finnmark and 4 from Trøndelag. The category *no accent* includes a majority of unclear cases (74; 38 from Finnmark, 23 from Trøndelag and 13 from Buskerud). Note that there are many unclear cases in Buskerud, both in the compound and double accent categories. However, the overall patterns look the same independent of inclusion of unclear cases.

Table 2: Overview of the results.

	Trøndelag	Buskerud	Finnmark	Total
Particle accent	20 (6.4%)	47 (16.4%)	105 (36.6%)	172 (19.4%)
Compound accent	238 (76.3%)	150 (52.4%)	61 (21.3%)	449 (50.7%)
Double accent	21 (6.7%)	75 (26.2%)	58 (20.2%)	154 (17.4%)
No accent	33 (10.6%)	14 (4.9%)	63 (22.0%)	110 (12.4%)
Total	312	286	287	885

As apparent from the table, there are clear differences between the different dialect areas, to a large extent corresponding to those reported on in the corpus study by Tengesdal & Lundquist (2021) (although they investigated Hedmark and not Buskerud). Compound accent is the most common realization in Trøndelag (76.3% in Table 2); the other three prosodic realizations range from 6.4% (particle accent) to 10.6% (no accent). There is a preference for compound accent also in Buskerud, but not as strong (52.4%). Particle accent (16.4%) and double accent (26.2%) are also rather common. In Finnmark, on the other hand, particle accent is more common (36.6%), whereas there is a more even distribution of the other prosodic categories (but there are quite a few unclear cases included in compound accent). Notably, 22.0% of the examples from Finnmark have no accent, which makes this category more frequent than double accent. No accent is twice as common in Finnmark than in Trøndelag and four times as common than in Buskerud.

In the following subsections, we consider different syntactic and semantic factors that may have an effect on the prosodic realization. First, we turn to word order and intervening elements.

#### 4.2 Word order: the effect of intervening words

The verb and the particle are adjacent in most of the examples (609/885, 68.8%). In 25.8% (228/885) of the cases, one word intervenes, 4.2% (37/885) have two words intervening, and only 11 cases (1.2%) have three or more intervening words. Below we focus mainly on the category of the intervener (pronoun, NP, adverb).

Table 3 presents the accent patterns in cases where the verb and particle are adjacent (left panel, no intervener), and when one pronoun intervenes between them. In both these cases, compound accent is licit;

when a pronoun intervenes, it can incorporate into the (minimal) prosodic word headed by the verb (cf. Figure 4 above). In the case of double accent, the pronoun incorporates into the preceding (minimal) prosodic word headed by the verb (without triggering any postlexical accent 2 shift).

Table 3: Prosodic realization with no interveners, or one pronominal intervener.

	Verb–particle adjacent			One pronoun		
	Trøndelag	Buskerud	Finnmark	Trøndelag	Buskerud	Finnmark
<b>Particle accent</b>	14 (5.8%)	27 (14.7%)	77 (42.3%)	4 (9.3%)	14 (21.2%)	21 (35.6%)
<b>Compound accent</b>	198 (81.5%)	126 (68.5%)	37 (20.3%)	29 (67.4%)	22 (33.3%)	13 (22.0%)
<b>Double accent</b>	5 (2.1%)	22 (12.0%)	23 (12.6%)	9 (20.9%)	29 (43.9%)	15 (25.4%)
<b>No accent</b>	26 (10.7%)	9 (4.9%)	45 (24.7%)	1 (2.3%)	1 (1.5%)	10 (16.9%)
<b>Total</b>	243	184	182	43	66	59

Note that Table 3 includes both examples where the verb is in the V2-position, as in (7a), and where the verb is *in situ*, either in complex tenses (7b) or embedded clauses (7c). We furthermore ignore the syntactic function of the intervening pronoun, i.e., it may be a subject pronoun (when the verb is in second position, (7a), or an object (7b)). We return to these factors in Section 4.3.

- (7) a. og så jogger du opp til Gaustatoppen (darbu\_02uk)  
 and so jog you up to Gaustatoppen  
 ‘and then you jog up to Gaustatoppen.’
- b. han hadde ramma det inn (darbu\_03gm)  
 he had framed it in  
 ‘He had framed it (the picture).’
- c. Jeg er glad jeg vokste opp her. (darbu\_01um)  
 I am happy I grew up here  
 ‘I’m happy that I grew up here.’

When the verb and particle are adjacent, compound accent is by far the most common pattern in both Trøndelag (81.5%) and Buskerud (68.5%). In Finnmark, particle accent is the most common realization (42.3%), but the other three realizations are also frequent. When one pronoun intervenes between the verb and particle, compound accent drops mainly in Buskerud (33.3%) but also in Trøndelag (67.4%). In Buskerud, we instead find accents on both verb and particle as the most frequent realization; there is 12.0% double accent in cases with no interveners, but 43.9% double accent in cases where a pronoun intervenes between verb and particle. An increase in double accent with intervening pronouns (compared to adjacent verb and particle) can be seen in Trøndelag and Finnmark, as well. In Finnmark, the preferred accent realization is particle accent, whether the verb and particle are adjacent, or one pronoun intervenes.

There are five cases in our data set where two pronouns intervene between the verb and the particle, as in (8a–b) below. In principle, compound accent is still expected to be licit in these cases. However, in our material, these cases are realized with double accent or particle accent. None of these five cases come from Trøndelag, where we would have the best chance of finding compound accent in this context.

- (8) a. så \_laughter\_ la vi oss ned og s-skøyt (aal\_01um)  
       so                   lay we REFL down and shot  
       ‘so we lay down and shot.’
- b. så sjekker man dem ut (kirkenes\_01um)  
       so check one them out  
       ‘then you check them out.’

The verb and the particle may also be separated by a sentence adverb or a noun phrase (simple or complex); see (9a) and (9b). The noun phrase can be a subject or, as in (9b), an object. Due to the syntactic rules of Norwegian, sentence adverbs and subjects can only intervene when the verb is in second position, as in (9a). An object may intervene independent of verb position; (9b) is an embedded clause with the verb *in situ*.

PROSODIC VARIATION IN PARTICLE CONSTRUCTIONS

- (9) a. det slettes vel ut etter hvert (inderoey\_04gk)  
 it delete.PASS MOD PART eventually  
 ‘It will be deleted eventually, I guess.’
- b. etter at han hogde skauen ned (darbu\_04gk)  
 after that he cut forest.DEF down  
 ‘after he cut the forest down.’

In Table 4, we give the accent patterns per county for cases when a sentence adverb (left panel) or noun phrase (right panel) intervenes between verb and particle.

Table 4: Prosodic realization with intervening sentence adverb or NP.

	Sentence adverb intervener			NP intervener		
	Trøndelag	Buskerud	Finnmark	Trøndelag	Buskerud	Finnmark
<b>Particle accent</b>	0 (0%)	4 (18.2%)	4 (18.2%)	2 (40.0%)	2 (28.6%)	2 (20.0%)
<b>Compound accent</b>	11 (57.9%)	2 (9.1%)	6 (27.3%)	0 (0%)	0 (0%)	1 (10.0%)
<b>Double accent</b>	6 (31.6%)	15 (68.2%)	10 (45.5%)	0 (0%)	4 (57.1%)	4 (40.0%)
<b>No accent</b>	2 (10.5%)	1 (4.5%)	2 (9.1%)	3 (60.0%)	1 (14.3%)	3 (30.0%)
<b>Total</b>	19	22	22	5	7	10

Compound accent is found with intervening adverbs, especially in Trøndelag, where it is the most common pattern. There are only two instances of compound accent in Buskerud, with the light adverbs *nå* and *jo*. Heavier intervening adverbs like *altså* and *kanskje* never appear in compound accent. Instead, we find mainly double accent or particle accent in these cases, and one case where both verb and particle are deaccented, and the stress realized on the adverb; see (10):

- (10) (og du kommer ('fort) inn)<sub>ω</sub><sup>max</sup> (i et (mil'jø))<sub>ω</sub><sup>max</sup> (kirkenes\_02uk)  
 and you come quickly PART in an environment  
 ‘and you quickly enter into an environment.’

Table 4 includes cases where both an adverb and a light pronoun intervene between the verb and the particle. A clear compound accent is only found in one of these cases; it is from Trøndelag and has the adverb *nå*:

- (11) men det finner jeg nå ut. (lierne\_03gm)  
 but it find I MOD out  
 ‘but I will find that out.’

There are six cases from Finnmark where Verb–Adverb–Particle sequences have been annotated as compound accent. However, due to the lack of a tone accent opposition in Finnmark, it is sometimes difficult to tell if these are cases of true compound accent or if the verb and particle belong to separate prosodic words. In at least three of the cases, we believe that the maximal prosodic word starts with the accented verb and ends at the particle, i.e., making up a true compound accent. In the other cases, the realization is perhaps better described as ‘verb accent’, i.e., the verb projects its own prosodic word, while the deaccented particle incorporates into another preceding or following prosodic word. (See Section 3.3 above on the difficulty of identifying compound accent in Finnmark.)

In all three dialect areas, double accent is common when an adverb intervenes between the verb and the particle. This trend is even stronger compared to cases when a pronoun intervenes (cf. Table 3). Overall, double accent is only encountered in 8.3% of the cases when verb and particles are adjacent, 32.1% with an intervening pronoun, and 49.2% with an intervening sentence adverb. This is not obviously an effect of information structure or underlying syntactic structure, but either related to the metric structure (avoid stress clashes) or speech planning; see further Section 5.

There are only a few instances of NPs intervening between verb and particle. Intervening NPs are particularly scarce in Trøndelag, where NP objects almost obligatorily follow the verb particle (cf. Larsson & Lundquist 2014). Despite the low numbers, it is notable that compound accent is fully absent in Trøndelag and Buskerud. In Finnmark, we find one case of a deaccented particle co-occurring with an accented verb, giving rise to what is labelled as compound accent. In this case, the intervening noun phrase carries an accent, and the particle is incorporated into the noun, i.e., there is not a compound accent spanning the verb and the particle. The no accent-pattern is otherwise more common in this syntactic



configuration, which is not surprising given that the intervening noun carries stress and accent.

4.3 *The syntactic function of the intervener and the position of the verb*

In Tables 3 and 4 above, we ignored the syntactic function of the intervener and focused only on the effect of any intervening material between verb and particle. To investigate the role of syntactic structure, and not just linear relations and (lexical) stress-specification, we now turn to the syntactic function of the intervener and the placement of the verb, i.e., if the verb stays in a syntactically local relationship with the particle inside the verb phrase, or if it appears in a VP-external V2 position.

Table 5 shows the accent patterns in the three counties, in utterances where a pronominal subject (left panel) or object (right panel) intervenes between verb and particle.

Table 5: Prosodic realization in utterances where a subject pronoun or object pronoun/reflexive intervenes between verb and particle.

	Subject pronoun			Object/reflexive intervener		
	Trøndelag	Buskerud	Finnmark	Trøndelag	Buskerud	Finnmark
<b>Particle accent</b>	3 (13.0%)	8 (21.1%)	9 (33.3%)	1 (5.0%)	6 (21.4%)	12 (37.5%)
<b>Compound accent</b>	14 (60.9%)	12 (31.6%)	7 (25.9%)	15 (75.0%)	10 (35.7%)	6 (18.8%)
<b>Double accent</b>	6 (26.1%)	17 (44.7%)	4 (14.8%)	3 (15.0%)	12 (42.9%)	11 (34.4%)
<b>No accent</b>	0 (0%)	1 (2.6%)	7 (25.9%)	1 (5.0%)	0 (0%)	3 (9.4%)
<b>Total</b>	23	38	27	20	28	32

Although there is some variation in the frequencies, the patterns are overall the same with subject and object interveners. In Trøndelag, compound accent dominates in both cases, with double accent as the main alternative. In Buskerud, double accent is the most frequent, closely followed by compound accent, independently of the syntactic function of the intervener. In Finnmark, the particle accent pattern dominates both with subjects and objects intervening.

There is a high proportion of *in situ*-verbs in our data set. The main verb surfaces in second position in only 276 out of 885 examples (31%). In eight examples, verb placement is not clear from the context, and in the remaining cases (601), the verb stays *in situ*; these cases involve auxiliaries, and/or embedded clauses, or infinitival clauses; there are many infinitival clauses in the material, which do not have V2 (*behov for å ta opp det* ‘need to take it up’, *godt å starte opp tidlig* ‘good to start up early’, etc.). Table 6 shows the effect of verb placement on accent. Only cases where the verb and the particle are adjacent, or where at most one pronoun intervenes between verb and particle, are included.

Table 6: Verb placement and prosodic realization, verb–particle adjacent or one intervening pronoun.

	V2			V-in-situ		
	Trøndelag	Buskerud	Finnmark	Trøndelag	Buskerud	Finnmark
<b>Particle accent</b>	5 (8.8%)	11 (15.3%)	16 (31.4%)	13 (5.7%)	29 (16.8%)	82 (43.4%)
<b>Compound accent</b>	38 (66.7%)	33 (45.8%)	11 (21.6%)	188 (82.5%)	111 (64.2%)	39 (20.6%)
<b>Double accent</b>	11 (19.3%)	26 (36.1%)	11 (21.6%)	3 (1.3%)	25 (14.5%)	26 (13.8%)
<b>No accent</b>	3 (5.3%)	2 (2.8%)	13 (25.5%)	24 (10.5%)	8 (4.6%)	42 (22.2%)
<b>Total</b>	57	72	51	228	173	189

The proportions of the four accent patterns differ to some extent between the V2 and *in situ* verb placement, but, again, the overall distribution is the same: compound accent is the most common realization in both Trøndelag and Buskerud, independently of verb placement, and particle accent is the most common in Finnmark. There is one systematic difference between the two contexts: double accent is more common in V2 contexts, particularly in Trøndelag and Buskerud: note that V2 examples more often have an intervening pronoun compared to cases where the verb is *in situ*, and this will increase the likelihood of double accent. There is also a higher proportion of modal verbs in the V2 contexts, and as we will see in the next section, modal verbs will also

negatively affect the likelihood of compound accent. Apart from the effect of intervening elements and verb type, the syntactic position of the verb does not affect the prosodic realization.<sup>11</sup>

We conclude from this section that the syntactic category of the intervening element (subject or object) has little or no effect on the prosodic realization. The syntactic position of the verb does not seem to have a direct effect either, apart from its consequences for what elements intervene between verb and particle. We return to the limited effect of surface syntactic structure in the discussion in Section 5.

In the next section, we turn to the type of verb and the semantics of the verb–particle combination.

#### 4.4 *Modal verbs and the semantics of the verb–particle combination*

In the data set, there are in total 31 instances of a modal verb followed by a particle, of the type *må ut* ‘must (go) out’ in (3) above. In these cases, compound accent appears to be illicit. Instead, particle accent is the most common realization, followed by double accent; double accent occurs when the modal verb has big accent (e.g., *jeg bare MÅ ut nå* ‘I simply must go out now’). We return to possible reasons for the lack of compound accent in Section 5 below.

As mentioned in Section 3, we have annotated the verb–particle constructions for semantics, distinguishing between directional and non-directional (often non-compositional and metaphorical) verb–particle combinations. A few cases are unclear. The directional particles have been further divided into two groups: the ones followed by a directional PP, and the bare ones. In the tables below, all modal verbs with a particle are excluded, and we only include examples where the verb and particle are adjacent or separated only by one pronoun. The results are discussed county by county.

In Trøndelag, compound accent is the most common accent pattern in both non-directional and directional contexts; see Table 7. However, there is somewhat less compound accent in directional contexts, compared to non-directional contexts, and slightly more particle accent and

11. When intervening pronouns and modal verbs are excluded, the pattern for V2 and verb-in-situ utterances look almost identical. For compound accent we find the following numbers: Trøndelag: 77.7% V2, 85.6% *in situ*; Buskerud: 65.3% V2, 70.2% *in situ*, Finnmark: 26.6% V2, 20.8% *in situ*.

double accent. This tendency is even stronger when the directional particle is followed by a PP (although the numbers are small). Among the non-directional examples, we find a near-categorical behavior: 87.5% of the cases are realized with compound accent, and only 3% have either particle accent or double accent. Considering only cases where there are no interveners, there is a single example of double accent; see (12). While there is more variation in the directional particles, compound accent is still the most frequent.

- (12) det gjør ikke det #ee #det vannes ut. (meraaker\_03gm)  
 it does not that it water.PASS out  
 ‘It doesn’t do that, it gets diluted.’

Table 7: Trøndelag, prosodic realization with respect to particle verb semantics.

	Non-directional	Directional	Dir+PP	Unclear
Particle accent	3 (1.8%)	6 (8.2%)	2 (11.1%)	0 (0%)
Compound accent	147 (87.5%)	54 (74.0%)	11 (61.1%)	14 (100%)
Double accent	2 (1.2%)	6 (8.2%)	3 (16.7%)	0 (0%)
No accent	16 (9.5%)	7 (9.6%)	2 (11.1%)	0 (0%)
Total	168	73	18	14

The overall pattern in Buskerud is similar to that in Trøndelag; see Table 8. Compound accent dominates strongly (78.2%) when the verb–particle combination is non-directional, while particle accent and double accent are more common in directional contexts. Still, compound accent is the most common pattern in directional contexts (51.1%). Again, the tendency to realize particle verbs with something other than compound accent is even stronger in directional particles followed by a PP, although the number of attestations is low.

Finally, consider the results from Finnmark in Table 9. Unlike the other two counties, Finnmark has particle accent as the overall most common pattern, but as we have seen, the distribution is more even. Here, there is no clear difference in the proportion of compound accent between the different semantic types, and the proportion of double accent

Table 8: Buskerud, prosodic realization with respect to the particle verb semantics.

	Non-directional	Directional	Dir+PP	Unclear
Particle accent	8 (7.9%)	17 (18.1%)	8 (25.8%)	4 (25.0%)
Compound accent	79 (78.2%)	48 (51.1%)	13 (41.9%)	8 (50.0%)
Double accent	13 (12.9%)	22 (23.4%)	10 (32.3%)	3 (18.8%)
No accent	1 (1.0%)	7 (7.4%)	0 (0%)	1 (6.3%)
Total	101	94	31	16

Table 9: Finnmark, prosodic realization with respect to the particle verb semantics.

	Non-directional	Directional	Dir+PP	Unclear
Particle accent	35 (32.7%)	44 (50.6%)	6 (22.2%)	3 (50.0%)
Compound accent	23 (21.5%)	19 (21.8%)	6 (22.2%)	2 (33.3%)
Double accent	20 (18.7%)	12 (13.8%)	4 (14.8%)	1 (16.7%)
No accent	29 (27.1%)	12 (13.8%)	11 (40.7%)	0 (0%)
Total	107	87	27	6

is also rather stable. On the other hand, particle accent is particularly common with directional particles without a PP.

To sum up this section, the semantics of the particle verb influences the prosodic realization. In both Trøndelag and Buskerud, compound accent is particularly common with non-directional particles, and the least common with directional particles in the context of a PP. In all three locations, the accented particles (either particle or double accent) are more common in directional than non-directional contexts; this is not surprising given that the particle often carries contrastive information in directional contexts. Still, it should be noted that the no accent pattern can be found when directional particles are followed by a PP, as the PP often carries stress in these contexts (e.g., *gå ut i skogen*, ‘go out into the forest’). Finally, the effect of semantics is relatively small: compound accent is the most common realization in Trøndelag and Buskerud independent of semantics and presence of PP, and particle accent is most common in Finnmark throughout the three categories.

#### 4.5 The syllable structure of the verb

Finally, let us consider the syllable structure of the verb. The verb forms in our data set are either monosyllabic (e.g., *gå* ‘go’), or bi-/polysyllabic (*vannes* ‘is being watered’), but they can also be underlyingly bisyllabic but realized as a monosyllabic form due to a process of apocope. This can happen both in the present tense (e.g., *sitter* > *sitt* ‘sit’) or in the past tense (*vokste* > *vokst* ‘grew’) or participle.<sup>12</sup> There are some cases of polysyllabic verbs that undergo apocope but remain bi-/polysyllabic, e.g., *leverte* > *levert* ‘delivered’, but since these cases are few (10 in total), and pattern with the other apocope verbs, we include them in a general apocope group.

Table 10 presents the patterns in Trøndelag. Here, there is no systematic difference in prosodic realization depending on number of syllables of the verb; compound accent dominates strongly with all verbs.

Table 10: Trøndelag, prosodic realization with respect to the syllables of verb form.

	Apocope	Monosyllabic	Polysyllabic
Particle accent	3 (3.2%)	5 (4.8%)	3 (4.0%)
Compound accent	76 (80.9%)	84 (80.8%)	66 (88.0%)
Double accent	4 (4.3%)	4 (3.8%)	3 (4.0%)
No accent	11 (11.7%)	11 (10.6%)	3 (4.0%)
Total	94	104	75

Table 11 gives the results from Buskerud. Here, compound accent is particularly common with verb forms with apocope. Particle accent, on the other hand, is more common with monosyllabic verbs. This may be an effect of the semantics: there are several high-frequent monosyllabic motion verbs, like *gå* (‘go’) and *kom* (‘came’, past tense), and these are more likely to appear with particle accent. There is an alternative phonological

12. For finding cases of apocope, we have compared the number of syllables in the orthographic and phonetic transcriptions. If the Bokmål transcription contains one more syllable than the phonetic form, the verb has been tagged as *apocope*. It is possible that some cases have an underlying monosyllabic form in the dialect, and what we refer to here as apocope can plausibly be a consequence of different types of processes. For the present purpose, the crude distinction suffices.

Table 11: Buskerud, prosodic realization with respect to the syllables of verb form.

	Apocope	Monosyllabic	Polysyllabic
Particle accent	2 (5.9%)	22 (20.6%)	13 (12.9%)
Compound accent	27 (79.4%)	56 (52.3%)	65 (64.4%)
Double accent	3 (8.8%)	23 (21.5%)	22 (21.8%)
No accent	2 (5.9%)	6 (5.6%)	1 (1.0%)
Total	34	107	101

explanation, namely that monosyllabic verbs are less likely to trigger compound accent since they are realized with accent 1. However, this is less likely, since, after all, compound accent is still the most common realization with monosyllabic verbs. Also, note that the number of apocope verbs is much lower in Buskerud than Trøndelag (as expected), and given the relatively low number of apocope verbs, differences between apocope and monosyllabic verbs should be treated with caution.

Finally, compound accent is more frequent with apocope verbs also in Finnmark; see Table 12. Particle accent, on the other hand, is less common with verb forms with apocope.

Table 12: Finnmark, prosodic realization with respect to the syllables of verb form.

	Apocope	Monosyllabic	Polysyllabic
Particle accent	10 (25.6%)	45 (43.3%)	35 (40.2%)
Compound accent	12 (30.8%)	22 (21.2%)	16 (18.4%)
Double accent	7 (17.9%)	12 (11.5%)	19 (21.8%)
No accent	10 (25.6%)	25 (24.0%)	17 (19.5%)
Total	39	104	87

To sum up, the results show that in Buskerud and Finnmark, compound accent is somewhat more common in particle constructions when the verb is realized with apocope, but this may be an effect of verb semantics rather than syllable structure. Overall, there is otherwise no strong effect of syllable structure on the prosodic realization.

## 5 Discussion

The topic of this article is the prosodic realization of particle verbs in three Norwegian dialect areas. Particle verbs are interesting from the point of view of prosody, and the syntax–prosody interface, since both the verb and the particle carry stress (i.e., are minimal prosodic words), but often only one of the elements (either the verb or the particle) is realized with an independent accent in an utterance. In the previous sections, we have investigated which factors affect the final prosodic realization of particle verbs. We have seen that intervening elements is an important factor: compound accent is ruled out when a noun phrase or an accented adverb intervenes between verb and particle. In fact, any intervening element that carries its own accent will make compound accent illicit; this is also the case with adjectives in constructions like *ser bra ut* (lit. ‘looks well out’), which are not included in the present study. Compound accent is the most common realization when the verb and particle are adjacent (subject to dialect variation, as shown above). Modal verbs can never head a maximal prosodic word with a particle, and the semantics of the particle verb also has an effect on the realization. On the other hand, the syllable structure of the verb correlates only to some extent with realization: compound accent tends to be more common with verb forms that have apocope, but this tendency is found only in Buskerud. Surface syntactic factors appear to play a very small – or no – role for the prosodic realization; when differences in the number of intervening words is controlled for, it does not seem to matter whether the verb is realized in the V<sub>2</sub> position or in the verb phrase, and there is no difference in realization depending on whether an intervening pronoun is the syntactic subject or object.

In the discussion below we divide the factors into deterministic and probabilistic factors, as well as factors that do not affect the realization at all. These factors can all in principle be either prosodic/phonological, morphosyntactic or lexical in nature. We focus on the variation between particle accent, compound accent, and double accent; we have little to say about the distribution of the realization with no accent, which is probably not determined by the factors investigated here (although it is more common in our Finnmark data than in the data from the other areas). Section 5.1 considers deterministic prosodic factors. In 5.2, we turn to factors that have a probabilistic effect. Finally in 5.3, we turn to morpho-



syntactic and lexical factors that are either deterministic or have no effect and discuss what the results can tell us about what information the phonological component of grammar in the syntax–prosody interface has access to.

### 5.1 Prosodic factors that rule out certain realizations

The most restricted prosodic realization is compound accent, although it is the most common one. Compound accent can only be found when the verb and particle are adjacent, or when there are unaccented elements intervening between them. There are only two types of unaccented words that may intervene between the verb and the particle: pronouns and monosyllabic, light sentence adverbs (*da*, *jo*, *nå*, and, in Trøndelag, the monosyllabic form of negation, *itj*). As soon as an accented word intervenes, compound accent is impossible; this is the case for instance when a heavier adverb or a full noun phrase intervenes, as in (13). In (13a), the accented adverb *altså* ‘in other words’ intervenes between the verb and the particle; the particle carries accent, and the verb is deaccented. In (13b–d), an NP intervenes between verb and particle; (13b) was produced with no accent, (13c) with particle accent, and (13d) with double accent.

- (13) a. (og <sup>1</sup>(‘den))<sub>ω</sub><sup>max</sup> (slo <sup>1</sup>(‘altså))<sub>ω</sub><sup>max</sup> <sup>1</sup>(‘inn)<sub>ω</sub><sup>max</sup> (flaa\_ma\_02, particle accent)  
 and it knocked ADV in  
 ‘and in other words, it came true.’
- b. (så gikk <sup>2</sup>(‘lærerer))<sub>ω</sub><sup>max</sup> (ned på <sup>2</sup>(‘bu\_tikken))<sub>ω</sub><sup>max</sup> (namdalen\_04gk, no accent)  
 so went teacher.DEF down on store.DEF  
 ‘then the teacher went down to the store.’
- c. (å slippe (‘<sup>1</sup>ungene dine))<sub>ω</sub><sup>max</sup> (‘ut)<sub>ω</sub><sup>max</sup> (vardoe\_02uk, particle accent)  
 to let kids.DEF your.PL out  
 ‘to let your kids out’
- d. (og <sup>1</sup>(‘da))<sub>ω</sub><sup>max</sup> <sup>1</sup>(‘kommer)<sub>ω</sub><sup>max</sup> <sup>2</sup>(‘andre)<sub>ω</sub><sup>max</sup> <sup>2</sup>(‘dia, lektor)<sub>ω</sub><sup>max</sup> <sup>1</sup>(‘inn)<sub>ω</sub><sup>max</sup>  
 and then come other dialects in  
 ‘and then other dialects come in.’ (inderoey\_03gm, double accent)

This result is not unexpected given the correlation between accents and maximal prosodic words; the presence of an accent is a diagnostic of a maximal prosodic word, by definition. The maximal prosodic word is not a recursive category, i.e., it is not possible to embed a maximal pros-

odic word in another maximal prosodic word. When the phonological component of grammar is fed a structure that contains a word that must project its own accent (i.e., a maximal prosodic word) between a verb and a particle, the verb and particle thus cannot be realized with a compound accent, as is illustrated in (14):

- (14) \*(Da ²('gikk ¹('mannen))<sub>ω</sub><sup>max</sup> ,ut))<sub>ω</sub><sup>max</sup> (i ²('hagen))<sub>ω</sub><sup>max</sup>  
 then went man.DEF out in garden.DEF  
 'Then the man went out in the garden.'

There are two main ways of prosodifying a sentence like (14). Either both the verb and the particle project their own maximal words (double accent, 15a), or the verb is deaccented, which results in particle accent (15b). In the latter case, we can assume that the deaccented verb prosodically incorporates into the following accented noun.

- (15) a. (Da ¹('gikk))<sub>ω</sub><sup>max</sup> ¹('mannen))<sub>ω</sub><sup>max</sup> ¹('ut))<sub>ω</sub><sup>max</sup> (i ²('hagen))<sub>ω</sub><sup>max</sup> (double accent)  
 b. (Da gikk ¹('mannen))<sub>ω</sub><sup>max</sup> ¹('ut))<sub>ω</sub><sup>max</sup> (i ²('hagen))<sub>ω</sub><sup>max</sup> (particle accent)  
 then went man.DEF out in garden.DEF  
 'Then the man went out in the garden.'

In principle, deaccentuation of both verb and particle is also possible when an accented word intervenes between verb and particle, but this is most likely when the particle is followed by a PP with which it forms a strong semantic unit, for example *ut på byen* (lit. 'out on town.DEF', 'out partying'), as in (16).

- (16) (Da gikk ¹('mannen))<sub>ω</sub><sup>max</sup> (ut på ¹('byen))<sub>ω</sub><sup>max</sup> (no accent)  
 then went man.DEF out on town.DEF  
 'Then the man went out partying.'

The examples in (13) can all be realized either with double accent, particle accent or no accent. In Finnmark, we also find cases where the verb is accented and the particle is unaccented, in structures similar to (13a–c) above. In those cases, the verb and the particle do not share an accent.

### 5.2 Factors that affect the likelihood of certain prosodic realizations

In the previous section, we saw that compound accent is sometimes illicit. Still, even when in principle possible, particle verbs are not always realized with compound accent. There is also a probabilistic element to the realization of accent, and some factors clearly affect the likelihood of a certain realization.

We have seen that particle accent is possible when accented elements intervene between verb and particle, but that double accent is more common. Furthermore, our study shows that intervening, non-accented elements increase the likelihood of double accent, and decrease the likelihood of compound accent. Intervening light sentence adverbs like *jo*, *nå*, and *da* often co-occur with double accent, and so do light pronouns. In short, the more words that intervene between the verb and the particle, the less likely it is that the verb and the particle constitute one maximal prosodic word. In principle this could follow from well-known phonological rhythmical constraints, like avoid stress clash: particle accent and compound accent could be means to avoid two adjacent stressed and accented syllables. Double accent could thus be seen as an unmarked pattern, and the two alternative realizations with only one accent result from a deaccentuation process triggered by stress clash avoidance. However, considering the effect of the syllable structure of the verbs in our data, there is little evidence that bisyllabic verbs are less likely to yield compound accent or particle accent compared to monosyllabic verbs, even though bisyllabic verbs followed by particles usually do not constitute stress clashes, at least in terms of clashes at the syllable level (e.g., <sup>2</sup>*vokse* <sup>1</sup>*opp* ‘grow up’). The very strong overall tendency to realize only one of the accents in particle verbs, independent of syllable structure of the verb, is more likely a signal of syntactic dependency or semantic unity of the verb and the particle, than an effect of stress clash avoidance.

However, it is not unlikely that some constraints active at the phonological phrase level can influence the number, sequencing and head location of  $\omega^{\max}$ s in relation to the verb–particle construction. A constraint penalizing prominence clashes is conceivable, analogous to lower-level stress clash avoidance. For example, there could be pressures conspiring against a sequence of a particle verb realized as a particle accented (right-headed)  $\omega^{\max}$  immediately followed by a compound accented (left-headed)  $\omega^{\max}$ . These could then result in the first  $\omega^{\max}$  becoming left-headed, or the second  $\omega^{\max}$  becoming right-headed (e.g., *Politimannen* (*satte* <sup>1</sup>(*inn*))

$^2(^{\text{kol,legaen}} i \text{ går.} \rightarrow \dots ^2(^{\text{satte,inn}}) ^2(^{\text{kol,legaen}})\dots$ ; or  $\dots (^{\text{satte}} \text{ } ^1(^{\text{inn}})) (^{\text{kol}} \text{ } ^1 \text{ } ^{\text{legaen}})\dots$  ‘The policeman incarcerated his colleague yesterday.’). Similarly, it is also conceivable that some constraints at the intonation phrase level govern the number, sequencing and head location of  $\varphi$ s. It remains to be explored whether or not such variable prosodic output structures can be captured by a set of competing Optimality Theoretic constraints (see Myrberg 2021: 8–9 and references therein), including well-established constraints such as those from Match Theory (Selkirk 2011), STRESSFOCUS, HEADEDNESS and ALIGNHEAD(1;  $\varphi$ ), others controlling phrase length (e.g., binarity constraints), or also constraints penalizing prominence clashes etc.

However, the distribution is also an empirical question. There might be systematic dialectal differences in how prominences are distributed within  $\varphi$ s. Differences in NPs with “semantically equally heavy elements” have been sketched by Gårding (1974), among others: While Stockholm Swedish is described as right-dominated (i.e., the default pattern in West and North Germanic), Southern Swedish (*skånska*) has been observed to have a more equal spread of prominence or to be left-dominated in such phrases (see Hansson 2003: 49–51 and references therein). Thus, dialectal differences in accent realization and accent distribution may influence the phrasing strategies available. In our results, Finnmark stands out from Trøndelag and Buskerud: particle accent is the dominant pattern instead of compound accent, yet proportionally not to the same extent as in the two other counties. Recall that the Finnmark varieties lack the tone accent opposition, with implications for the realization of for instance edge tones, giving rise to the possibility of alternative phrasing strategies. Some of the dialectal variation in our study might thus stem from phonological differences.

An alternative approach for explaining these probabilistic effects is through production planning (e.g., Wagner 2011, Tanner et al. 2017, Tamminga 2018). According to the production planning hypothesis, variable sandhi phenomena can be explained through the planning span in speech production. For example, Tanner et al. (2017) investigate how variable word-final *t/d*-deletion in English is affected by factors like the strength of prosodic boundaries, conditional probability of the following word and word frequency, i.e., factors that indicate how likely it is that the following word is within the same production planning span as the target word. *T/d*-deletion is conditioned by the phonological features of

the following sound, which here means the onset of the following word, but this effect will only be visible if the following word is within the same planning scope as the *t/d*-final word. Tanner et al. find, as predicted, that in contexts where the following word most likely is not in the same planning unit, the onset of the following word plays a smaller role in accounting for the allomorphy. If we apply this reasoning to our study, we could assume that compound accent and particle accent should only occur if the particle is within the same planning unit as the verb. As stated above, the size of the planning unit will be affected by, e.g., word frequencies and speech rate, but overall, the likelihood for the verb and particle to be part of the same planning unit is smaller when more words intervene. The production planning hypothesis thus correctly predicts less compound and particle accents, and more double accents, the more words there are that intervene between the verb and the particle. The effect is, however, considerably more obvious for compound accent than particle accent, which we will return to below.

The production planning hypothesis is also indirectly supported by our other probabilistic factor, namely the semantics of the verb–particle combination. We found that in both Trøndelag and Buskerud, compound accent is almost categorically produced when the verb plus particle has a metaphorical or non-directional interpretation (and no words intervene). In these cases, the verb and the particle must be lexically stored as units (although syntax treats them as individual words). These are often frequently used collocations, and most importantly, the meaning of these particle verbs is often non-compositional. This will presumably increase the likelihood for a speaker to include the particle within the same production unit as the verb. This differs from directional particle verbs, where the interpretation is compositional. For example, in a sentence like *han svømte ut til båten* ‘he swam out to the boat’, there is semantic information independently present in both the verb (here, manner) and the particle (direction). A directional particle and the preceding verb are presumably less likely to be stored as a lexicalized item, and also, the conditional probability of a particle following the verb is presumably lower in transparent than in non-compositional particle verbs, compare the directional combination *løpe ut/inn/ned/opp* (‘run out/in/down/up’) and the non-compositional *skjelle ut/\*inn/\*ned/\*opp* (lit. ‘yell out/\*in/\*down/\*up’, ‘scold’).

However, information structure may also explain part of the difference between non-directional and directional particle verbs. Since both the verb and the particle independently contribute meaning to the directional particle verb, either of them can be focused. Realizing the verb with big accent makes both the particle accent (obviously) and the compound accent (less obviously) illicit. Thus, information structure will also account for some of the difference in stress pattern between the metaphorical and directional verbs.

Moreover, production planning cannot explain the differences between the three dialect types. Given that the three dialect areas exhibit systematic distributions of prosodically left- vs. right-headed particle verbs, it is likely that the attested dialectal differences in part can be explained by dialectal prosodic preferences (in line with Tengesdal & Lundquist 2021). As we have seen, Trøndelag notably stands out with the highest proportion of compound accent, especially when the verb and particle are adjacent. East Norwegian has previously been described as exhibiting a pattern of stress addition to the initial syllable in certain words (like loanwords and particle verbs), resulting in postlexical accent 2. In Trøndelag, this process has been generalized and can even apply to words where morphological and prosodic factors in other East Norwegian varieties block it (e.g., unstressed prefixes: *be<sup>1</sup>tone* → <sup>2</sup>*be,tone* ‘(to) stress’; original stress site accent 2: *sjoko<sup>2</sup>lade* → <sup>2</sup>*sjoko,lade* ‘chocolate’; see Riad 2015: 189–192, Kristoffersen 2000: 165–166). Finnmark stands out with particle accent as the most frequent pattern overall, but this is far smaller proportionally than the dominant compound accent is in Trøndelag or Buskerud. Considering that Finnmark lacks a tone accent opposition, this suggests that dialectally constrained prosodic factors variably influence the prosodic realization of particle verbs.

To sum up this section, it seems clear that several different factors interact for prosodic realization. Intervening (accented or unaccented) elements increase the likelihood of double accent; with intervening accented elements, compound accent is illicit. This is more likely a signal of syntactic dependency or semantic unity of the verb and the particle, than an effect of stress clash avoidance, given that the syllable structure of the verb has little effect on the prosodic realization. Production planning can also to some extent explain why the realization is affected by linear distance between verb and particle, and why semantics (and lexicalization) can play a role. Information structure plausibly also plays a

role. Differences between the three dialect types in accent realization and accent distribution may influence the phrasing strategies available and affect the preferences in particle constructions.

### 5.3 Factors that do not influence particle prosody: Morphosyntactic and lexical factors

Our study shows that the surface structure does not affect the likelihood of the different prosodic realizations. The verb and the particle are equally likely to be realized as one prosodic unit (compound or particle accent) when they surface as one constituent within the verb phrase, as when they are separated by several syntactic phrase boundaries, as would be the case when the main verb surfaces in the V2 position (i.e., V in C).

- (17) a. [CP Han kasta [TP[<sub>VP</sub> ut hunden]]] (V in C, Part in vP)  
 ‘He threw out the dog.’  
 b. [CP Han har [TP[<sub>VP</sub> kasta ut hunden]]] (V and Part in vP)  
 ‘He has thrown out the dog.’

Similarly, in both these contexts, one or several light elements may intervene between the verb and the particle. While presence of overt material between the verb and the particle reduces the likelihood of compound accent (and to some extent particle accent), the effect is of equal size when a subject pronoun or an object pronoun intervenes. For example, the linear string *kasta han ut* ‘thrown him out’ can instantiate a constituent, as in (18b), where the non-finite verb, the object pronoun and the particle are the only elements inside the vP. The three words can also belong to three separate phrases, CP, TP and vP, as in (18a), where the verb (past tense) sits in C, and the subject *han* ‘he’ sits in Spec,TP, and the particle surfaces inside the vP.

- (18) a. [CP I går kasta [TP han [<sub>VP</sub> ut hunden]]] (V in C, Part in vP)  
 ‘Yesterday, he threw out the dog.’  
 b. [CP Han har [TP [<sub>VP</sub> kasta han ut]]] (V and Part in vP)  
 ‘He has thrown him out.’

Although we have not systematically investigated the role of tense and finiteness, we may conclude from the absence of effects of both verb placement and syllable structure, that tense and finiteness play a limited

or no role in the licensing of the different accent patterns. Both compound and particle accent are possible with finite and non-finite verb forms, which often are homophonous in Norwegian (see, e.g., the homophony between simple past and the participle in (18) above). Some verbs have different accents and number of syllables in different tenses (e.g., *å koma<sub>2</sub> ut* – *kjem ut* ‘to come out – comes out’), but in our data, this does not seem to affect the accent patterns. This is in principle an exciting result in light of the findings discussed in Section 5.2: An extra syllable linked to a light pronoun inserted between the stressed syllable in the verb and the particle decreases the likelihood of compound accent, but an extra syllable linked to tense/finiteness does not. Again, this points towards a production planning account of the variation: the number of syllables in verbs does not correlate with frequency or presence of semantic information, e.g., past tense forms verbs are often monosyllabic, but semantically more complex than their bisyllabic non-finite and present tense forms. From a production planning perspective, frequency (or lexicalization status) rather than syllable structure may play a more prominent role.

Our results clearly suggest that the phonological component of grammar ignores surface syntactic structure. However, the underlying syntactic relationship between verb and particle is important, as is clear from the “lexico-syntactic” restrictions on compound accent. In the following we look at these in more detail, considering in turn modal verbs + particle, particles used as prepositions, constructions with adjectives, and morphological compounds. Whereas the constructions with modal verbs were included in our study (see Section 3.2 above), the other cases were not, since they do not involve particle verbs. However, as we will see, the comparison gives insights into the factors involved in the prosodic realization of verb particles.

First, we have seen that a modal verb and particle never share a compound accent. Following earlier proposals such as van Riemsdijk (2002), we assume that the modal verb licenses a phonological empty motion verb (GO) in these contexts. Thus, the modal verb and the particle are not generated in a local verb–particle configuration; the particle stands in a local relationship to the null motion verb. This suggests that a local verb–particle configuration in the underlying structure (but not necessarily in the surface structure), is a prerequisite for a compound accent. This is not true for particle accent (or double accent), which is a licit real-



ization for modals followed by particles. This restriction on compound accent cannot be phonological in nature, as metrically identical examples with lexical verbs can have compound accent (cf. *gå ut* ‘go out’ with *må ut* ‘must out’).

Second, there is a related restriction on compound accent, namely on particles used as prepositions (see, e.g., Lundquist & Ramchand 2013). Unlike (19a), examples like (19b) below are not included in our corpus study; they do not behave prosodically like particle constructions. In (19a), a compound accent is licit, but not in (19b).

- (19) a. Han gikk ut i hagen. (Verb particle)  
 he went out in garden.DEF  
 ‘He went out in the garden.’
- b. Han gikk ut døra. (PP; \*compound accent)  
 he went out door.DEF  
 ‘He went out the door.’

We assume that the verb and *ut* are not in a structural verb–particle relationship in (19b), but rather, that the *ut* is the head of a PP. In this case, the restriction on compound accent cannot be phonological, as analogous cases like (19a) are fine with compound accent. Again, we conclude that compound accent only is licit when the verb and particle stand in certain syntactic relationship to each other, i.e., in a verb–particle relationship. Once again, particle accent is not limited by this factor: the most natural way of realizing (19b) is by deaccenting the verb and realizing the accent on the preposition *ut*.

Third, there are additional cases where compound accent is illicit, despite the fact that the stress and accent information of the elements involved are identical to those of the verb and particle in a verb–particle combination. Compare the examples given in (20a) and (20b) to the particle construction in (20c).

- (20) a. (Han skal kjøpe <sup>1</sup>(‘hus))<sub>ω</sub><sup>max</sup>/\*(Han skal <sup>2</sup>(‘kjøpe, hus))<sub>ω</sub><sup>max</sup>  
 he will buy house  
 ‘He will buy a house.’
- b. (Det ser <sup>1</sup>(‘bra ut))<sub>ω</sub><sup>max</sup>/\*(Det ser <sup>2</sup>(‘bra, ut))<sub>ω</sub><sup>max</sup>  
 it sees good out  
 ‘It looks good.’

- c. (Han skal gå 'ut)<sub>ω</sub><sup>max</sup>/(Han skal <sup>2</sup>(gå,ut)<sub>ω</sub><sup>max</sup>  
 he will go out  
 'He will go out.'

In (20a), a verb is followed by a bare noun. This typically leads to deaccentuation of the verb, just like with particle verbs, but never to compound accent. In (20b), a particle is preceded by an adjective. We have no reason to assume that the lexical stress information of an adjective is different from that of a verb, but the adjective and the particle are never realized as a prosodic unit with a postlexical compound accent, at the maximal prosodic word level. Instead, the adjective is accented and stressed, while the particle is deaccented and likely destressed; the particle incorporates prosodically to the minimal prosodic word, i.e., there is no postlexical accent 2 shift. Compare (20b), where compound accent is illicit, with a verb–particle combination (20c), where compound accent is licit.

These three phenomena – modal verbs, prepositional particles, and adjectives followed by particles – all illustrate the fact that the restriction on compound accent cannot be fully explained by linear order and stress specification of the verb and the particle; in addition, the verb and the particle must stand in a verb–particle relation. This means that the phonological component of grammar has access to the underlying syntactic structure and not just the linear order and lexical stress specifications. Note that we do not need to assume that directional and metaphorical particle verbs have different underlying structures (contra Wurmbbrand 2000). Rather, the fact that the compound accent is licit in both metaphorical and directional particle verbs, but not in other lexically and phonologically similar contexts (see further below), suggests that directional and metaphorical particle verbs share the same structure.

In sum, we have seen that compound accent is only licit when (a) the verb and the particle are not separated by an accented word and (b) the verb and particle stand in a structural verb–particle relationship. Particle accent, on the other hand, is more freely available, and follows a more common deaccentuation pattern known to apply to words like verbs, found with other types of verb–complement combinations, for example a verb followed by a bare noun (*kjøpe hus* 'buy house') or a directional, particle-like preposition (*gå ut døra* 'walk out the door'). Also, deaccentuation of the verb is also possible when the verb and the particle are split

up by intervening accented words, i.e., when the verb and the particle are not part of the same maximal prosodic word. This is not the case for compound accent, which requires that the particle and verb indeed make up one phonological word. Still, we have to rely on several principles in the syntax–prosody mapping to make this explanation meaningful. Note that lexical information alone cannot rule out compound accent in, e.g., strings consisting of a verb, noun and particle. In Norwegian compounds, several lexically accented elements can occur in a string which receives compound accent. Compare the compound bird species name in (21a) with a metrically similar particle verb with an intervening noun in (21b):

- (21) a. (en <sup>2</sup>'kjempe,kjegle,nebb)  
       a   giant-cone-bill  
       ‘a giant conebill (bird species)’  
       b. \*(han <sup>2</sup>'satte,kjegla,opp)  
       he   put cone.DEF up  
       ‘He put up the cone.’

In other words, the phonological component of grammar needs to disregard accent information of elements in a compound, but not of independent phrases. Also, note again that the probabilistic factors we have encountered in the study of particle verb accent play no role in morphological compounds: compounds receive compound accent independent of their length.

To sum up the discussion, let us now address the research question stated in the introduction: what information does the phonological component of grammar in the syntax–prosody interface have access to? It clearly needs access to information about linear order, stress and information structure (e.g., focus). We have also seen that it needs access to information about the syntactic relationship between the verb and the particle: compound accent is only licensed when the verb and particle are generated in a verb–particle relationship. Yet, the final syntactic structure, or surface structure, is ignored by the phonological component. Both compound accent and particle accent are licensed in contexts where the verb and particle do not form a constituent, which is potentially problematic for accounts that assume a more or less strict mapping from syntactic structure to prosody. It is beyond the scope of this article to give a

theoretical account of the syntax–prosody interface, as motivated by the prosodic realizations of particle verbs, but for now we can at least conclude that the very “late” stages of phonology (see, e.g., Coatzee & Patter 2011) need access to information about underlying syntactic relations between words, while it may fully ignore syntactic surface structure.

## 6 Conclusion

In this paper, we have investigated the prosodic realization of particle verbs in corpus data from three dialect areas, Buskerud, Finnmark, and Trøndelag. Four different realizations (particle accent, compound accent, double accent, no accent) can be found in all three dialect areas, but in different proportions. In all areas, we find a reduced likelihood of the verb and particle forming one prosodic unit (i.e., either compound or particle accent) when elements intervene between them; compound accent is affected more than particle accent. Similarly, we find that non-directional (often non-transparent) verb–particle units are more likely to be realized with only one accent. There are also categorical differences in the distribution of particle accent and compound accent: compound accent is only licit when the verb and the particle are not separated by an accented word and the verb and particle stand in a structural verb–particle relationship. Particle accent, on the other hand, is more freely available.

We have argued that the effects of the non-categorical factors can in part be explained through a production planning perspective: non-lexicalized particle verbs, as well as non-adjacent verbs and particles, are more likely to end up in separate production units, which limits the possibility for them forming one maximal prosodic word. Many questions remain, especially regarding the differences between the dialect areas – compound accent is less common in Buskerud than Trøndelag, and this is unlikely a result of differences in planning scope. Rather, some of the differences can be attributed to an optional stress addition rule, which applies more often in the Trøndelag varieties than in Buskerud. Similarly, the domains for particle accent seem to be bigger than the domains for compound accent. This cannot directly be attributed to the notion of production planning, either. From a prosodic perspective, such differences could be conditioned by more general pressures found in Germanic lan-

guages, involving a general tendency for deaccentuation of certain words (predicates are more likely deaccented than arguments), and the fact that the prosodic head of a phrase generally aligns close to the right phrase edge.

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## Samandrag

Partikkelverb i norsk er ofte realiserte som eitt maksimalt prosodisk ord med hovudtrykk anten på verbet eller partikkelen, men sumtid projiserer verbet og partikkelen egne maksimale prosodiske ord. Denne artikkelen inneheld ein prosodisk analyse av partikkelverb i Nordisk dialektkorpus (Johannessen et al. 2009) frå tre dialektområde: Finnmark, Trøndelag og Buskerud. I alle tre områda er der variasjon mellom minst fire ulike aksentrealiseringar. Eit maksimalt prosodisk ord med hovudtrykk på verbet, sokalla samansetjingsaksent, er den vanlegaste realiseringa av partikkelverba i materialet, men dette er au den mest avgrensa realiseringa; han er ikkje mogeleg når eit aksentuert ord intervenserer mellom verb og partikkel, og han krev ein verb–partikkelstruktur. I tillegg er der fleire probabilitiske faktorar som påverkar sannsynet for ei viss prosodisk realisering. Syntaktiske drag, som konstituentar i overflatestrukturen, vert oversette av den fonologiske grammatikken.

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