

# Two structural positions for locative and directional PPs in Norwegian motion constructions \*

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## 1. Introduction

In this paper, I will investigate the syntactic structure of sentences in Norwegian that contain a combination of a verb of motion and the locative preposition *i* ('in'). Examples of such sentences are given in (1) below:

- (1) a. Jon syklet i grøfta.  
*Jon biked in ditch-DEF*  
b. Hans kastet ballen i stua.  
*Hans threw ball-DEF in living room-DEF.*

Many speakers of Norwegian<sup>1</sup> accept sentences like the ones in (1) as ambiguous between a telic reading of directed motion and an atelic reading of located motion. (1a), for instance, can either mean that (i) *Jon* ended up in the ditch as a result of his biking, where the PP gives the telos, or endpoint, of the event, or (ii) that the biking event took place in the ditch, in which case the PP *i grøfta* locates the biking event spatially.

## 2. Data

As already mentioned, many speakers of Norwegian accept sentences like the ones in (1) above as ambiguous. More examples are given in (2) (with transitive verbs) and (3) (with intransitive verbs) below:

- (2) a. Petter falt i brønnen.  
*Petter fell in well-DEF*

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<sup>1</sup> Not all speakers of Norwegian accept this type of ambiguity, however. Although they might accept sentences like (1a) as ambiguous, the only possible interpretation for the sentences in (5) would be a located motion reading.

- b. Per hoppet i vannet.  
*Per jumped in water-DEF*

- (3) a. Hårek rullet tønna i kjelleren.  
*Hårek rolled cask-DEF in basement-DEF*  
 b. Per bar skiene i garasjen.  
*Per carried skis-DEF in garage-DEF*

For speakers who accept a sentence like (2a) as ambiguous, the sentence can either have the meaning that *Petter* fell *into* the well (directed motion), or it can mean that the falling event took place in the well, with the *i*-PP locating the event in space.

### 2.1 Temporal adverbials and telicity

Temporal adverbials give an indication of the telicity of an event, where the temporal PP *i et kvarter* ('for 15 minutes') occurs with atelic events and *på et kvarter* ('in 15 minutes') with telic events<sup>2</sup>. The sentences in (2) and (3), however, accept both of these adverbials, but on different interpretations. Consider the sentences in (4)<sup>3</sup>:

- (4) a. Jon syklet i grøfta *i et kvarter* (located motion).  
 'Jon biked in the ditch for 15 minutes'.  
 b. Jon syklet i grøfta *på et kvarter* (directed motion).  
 'Jon biked into the ditch in 15 minutes'.  
 c. Per hoppet i vannet *i et kvarter* (located motion).  
 'Per jumped in the water for 15 minutes'.  
 d. Per hoppet i vannet *på et kvarter* (directed motion).  
 'Per jumped into the water in 15 minutes'.

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<sup>2</sup> *i*=English 'in', while *på*=English 'on', but the time adverbials *i en time* and *på en time* translate into English *for an hour* and *in an hour*, respectively. Whereas *i en time* appears with atelic events only, the converse holds of *på en time*, which is only possible with telic events, and thus, time adverbials of this type are frequently (since Dowty 1979) employed as diagnostics in order to find out whether a given event is telic or atelic.

<sup>3</sup> I have chosen to translate the sentences with the simple past also in English, where it is more natural to use the progressive to signal an ongoing event. In Norwegian, however, there is no such distinction, and the distinction between completed and ongoing events is marked e.g. by means of temporal adverbials.

- e. Hårek rullet tønna i kjelleren *i et kvarter* (located motion).  
 ‘Hårek rolled the cask in the basement for 15 minutes.’
- f. Hårek rullet tønna i kjelleren *på et kvarter* (directed motion).  
 ‘Hårek rolled the cask into the basement in 15 minutes.’

However, when the verb is used in isolation, only *i en time* is accepted, which indicates that the event is atelic, cf. (5a, c).

It is generally accepted that telicity should be considered a property of the whole predicate, and not simply a property of the verb in isolation. As was first noted by Verkuyl 1972, the addition of an endpoint-denoting (Goal) PP to an otherwise atelic verb can induce a telicity shift from an atelic into a telic event. The sentences in (5) give a few examples of this. For instance in (5a), when the verb *sykle* (‘bike’) is used in isolation, the event can be classified as an atelic event of biking, accepting *i en time* (‘for an hour’), while (5b) shows that if the endpoint-denoting PP *til byen* (‘(in)to town’) is added, *i en time* is no longer accepted, and *på en time* must be chosen instead, indicating that the predicate is telic:

- (5) a. Jon syklet *i en time*/\**på en time*.  
 ‘Jon biked for an hour/\*in an hour.’
- b. Jon syklet til byen \**i en time*/*på en time*.  
 ‘Jon biked into town \*for an hour/in an hour.’
- c. Hans spaserte *i en time*/\**på en time*.  
 ‘Hans strolled for an hour/\*in an hour.’
- d. Hans spaserte til flyplassen \**i en time*/*på en time*.  
 ‘Hans strolled to the airport \*for an hour/in an hour.’

Thus, it seems that when the verb is used in isolation, the event described is atelic, but still, as the sentences in (4) show, the addition of a prepositional phrase with *i* does not necessarily result in the expected shift in telicity from an atelic into a telic event. Instead, the interpretation of the event is ambiguous between a telic reading of directed motion and an atelic event of located motion. In the following, I will argue that differences in interpretation like the ones observed are best treated as resulting from differences in the syntactic structures projected for the two readings of these sentences.

## 2.2 VP constituency tests

Constituency tests like topicalization and *do so*-substitution target a whole constituent, and are thus often employed as tests of syntactic structure. In the following, we will show that data from VP-topicalization suggests that there is a difference between locative and directional PPs with respect to topicalization. Since only whole constituents can be topicalized, only phrases that do not appear VP-internally can be stranded under VP-topicalization. Consider the sentences in (6), where VP is fronted, stranding the *i*-PP:

- (6) a. Rulle tønna gjorde Hårek i kjelleren.  
*Roll cask-DEF did Hårek in basement-DEF*  
 ‘What Hårek did, was to roll the cask in the basement’.
- b. Bære skiene gjorde Per i garasjen.  
*Carry skis-DEF did Per in garage-DEF*  
 ‘What Per did, was to carry the skis in the garage’.
- c. Kaste ballen gjorde Hans i stua.  
*Throw ball-DEF did Hans in living room-DEF*  
 ‘What Hans did, was to throw the ball in the living room’.

For the sentences in (6), the only possible interpretation is one of located motion, indicating that locative and directional PPs differ with respect to their structural position. While directional PPs appear VP-internally, and cannot be stranded under VP-topicalization locative PPs appear outside of the projection of the verb.

This assumption is further corroborated by data from *do so*-substitution (Norwegian *gjøre det samme* ‘do the same thing’). Consider the sentences in (7):

- (7) a. Jon syklet i grøfta og Per gjorde det samme i garasjen.  
 ‘Jon rode his bike in the ditch and Per did so in the garage’.
- b. Per hoppet i vannet og Kjell gjorde det samme i grøfta.  
 ‘Per jumped up and down in the water and Kjell did so in the ditch’.
- c. Hårek rullet tønna i kjelleren og Per gjorde det samme i entreen.  
 ‘Hårek rolled the cask in the basement and Per did so in the hall’.

Again, the only available reading for the sentences in (7) is a located motion reading. Hence, data from VP-topicalization and *do so*-substitution indicates that there is indeed a structural difference between locative and

directional PPs. While directional PPs appear inside of the verb phrase, locative PPs appear outside of the verb phrase, which explains the fact that only locative PPs can be stranded under VP-topicalization or *do so*-substitution.

### 2.3 Adverbial placement

Nilsen 1998 argues that Norwegian adverbial PPs are hierarchically ordered, ie. when there is more than one adverbial PP present, they appear in the following order:

- (8) < V PP<sub>dir</sub>, PP<sub>inst</sub>, PP<sub>dir</sub>, PP<sub>tel</sub>, PP<sub>atel</sub>, PP<sub>loc</sub>, PP<sub>temp</sub> >  
 (adapted from Nilsen (1998:109))<sup>4</sup>

Different from the present approach, Nilsen argues against right-adjunction, arguing instead that adverbial PPs are best treated as reduced relative clauses on the event, appearing in the specifier positions of functional projections in a Cinquean hierarchy. The surface ordering of constituents is then derived via movement. This view is compatible with Kayne's LCA, but in order for this approach to work, it has to allow for head movement out of a specifier position, which represents a serious weakening of the theory.

The examples in (9) are taken from Nilsen 1998 (pp. 108-109):

- (9) a. Sprang til jobben gjorde han på to minutter.  
*Ran to job-DEF did he in two minutes*  
 'What he did, was run to work in two minutes'.  
 b. \*Sprang på to minutter gjorde han til jobben.  
*Ran in two minutes did he to work-DEF*  
 'What he did, was run in two minutes to work'.

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<sup>4</sup> Nilsen 1998 distinguishes between telic and atelic PPs (PP<sub>tel</sub> and PP<sub>atel</sub>, respectively), where he assumes that PPs like *i en time* ('for an hour') instantiate atelic PPs, occurring with atelic predicates, while PPs like *på en time* ('for an hour'), which occur with telic predicates, are assumed to be telic. Normally, however, telicity is considered a property of predicates, and it is also possible to have different combinations of these PPs simultaneously, with different effects on the telicity of the predicate, like eg. *Per vasket golvet på en time* ('Per cleaned the floor in an hour') (telic) or *Per vasket golvet i en time* ('Per cleaned the floor for an hour') (atelic), or also *?Per vasket golvet på en time hver dag i en måned* ('Per cleaned the floor in an hour every day for a month') (telic). Thus, I will simply refer to temporal PPs of this kind as temporal *i*-PPs and temporal *på*-PPs.

The contrast between (9a) and (9b) is quite sharp. (9a), with the directional PP preceding the temporal *på*-PP is grammatical, whereas (9b), with the PPs in the opposite order, is ungrammatical.

According to Nilsen's hierarchy, directional PPs can appear in two positions, either in the position immediately to the right of the verb, or in the position following instrumentals, but preceding temporal PPs. Locative PPs, on the other hand, always follow instrumental and temporal PPs (ie. when there is more than one of these PPs present at the same time).

These assumptions can be used to test the structures; consider the sentences in (10), with instrumental PPs. Since instrumentals can either precede or follow directional PPs, but must precede locative PPs, an instrumental PP preceding the *i*-PP should result in an ambiguous interpretation of the sentence, but if the order of PPs is the opposite, the resulting event should unambiguously be interpreted as an event of directed motion:

- (10) a. Jon har syklet [på trehjulssykkel] [i grøfta] (locative).  
*Jon has biked on tricycle in ditch-DEF*  
 b. Jon har syklet [i grøfta] [på trehjulssykkel] (directional).  
 c. Hårek har trillet tønna [i trillebår] [i kjelleren] (locative).  
*Hårek has rolled cask-DEF in wheelbarrow in basement-DEF*  
 d. Hårek har trillet tønna [i kjelleren] [i trillebår] (directional).

Looking at the sentences in (10), we see that the sentences where an instrument PP appears between the verb and the *i*-PP (ie. in (10 a, c)), the PP can only receive a locative interpretation, while (10 b, d), with the opposite ordering of the PPs, the *i*-PP is unambiguously interpreted as directional. This pattern is, in fact, consistent for all the sentences in (10), which lends further support to the claim that directional PPs appear closer to the verb than locative PPs.

Further indication of the position of locative and directional PPs comes from the ordering of temporal *på*-PPs and temporal *i*-PPs, which follow directionals, but precede locative PPs. The prediction here is that a temporal *på*-PP or a temporal *i*-PP preceding the *i*-PP (ie. the PP which is ambiguous between a locative and a directional reading) should result in a located motion reading of the sentence, while the opposite order of PPs, with the *i*-PP preceding the temporal *på*-PP or the temporal *i*-PP, should result in a directed motion reading of the event. Consider the sentences in (11):

- (11) a. Per har hoppet [i en time] [i vannet].  
*Per has jumped for an hour in water-DEF*  
 ‘Per has been jumping (up and down) in the water for an hour’.
- b. Per har hoppet [i vannet] ?[på en time]/[i en time] (repetitive).  
*Per has jumped in water-DEF ?in an hour/for an hour*  
 ‘Per has been jumping in the water ?in an hour/for an hour’.
- c. Ballen har rullet [i en time] [i åkeren].  
*Ball-DEF has rolled for an hour in field-DEF*  
 ‘The ball has been rolling in the field for an hour’.
- d. Ballen har rullet [i åkeren] [på en time].  
*Ball-DEF has rolled in field-DEF in an hour*  
 ‘The ball has rolled into the field in an hour’.
- e. ?Hårek har rullet tønna [i en time] [i kjelleren].  
*Hårek has rolled cask-DEF for an hour in basement-DEF*  
 ‘Hårek has been rolling the cask in the basement for an hour.’
- f. Hårek har rullet tønna [i kjelleren] [på en time].  
*Hårek has rolled cask-DEF in basement-DEF in an hour*  
 ‘Hårek has rolled the cask into the basement in an hour’.

The interpretation of the sentences in (11) show that the prediction is indeed borne out. In the sentences in (11a, c, e), where the *på*- or *i*-PP precedes the *i*-PP, the sentences can only be interpreted as events of located motion, whereas when the PPs appear in the opposite order, only a directed motion reading is available.

#### 2.4 Binding of anaphora

As we have seen above, there is good reason to believe that locative and directional PPs occupy different positions in the syntactic structure, to the effect that directional PPs are merged lower in the structure than locative PPs.

Facts about the binding of anaphora add further support to this claim. According to Binding Theory Principles A and B, reflexives and pronouns should be expected to be mutually exclusive, since BT Principle A requires a reflexive to be c-commanded by an element that is coindexed with it, while according to BT Principle B, the opposite restriction holds; a pronoun cannot be located within the same domain as a c-commanding DP coindexed with it.

Assuming directional PPs to appear lower down in the syntactic structure than locative PPs, we should expect there to be differences between the two readings of these sentences to the effect that only directional PPs permit

reflexives coreferent with the direct object, which we will see is indeed the case. The sentences in (12) give examples of such sentences:

- (12) a. Jeg kastet Per<sub>i</sub> i svømmebassenget sitt<sub>i</sub> (directional).  
*I threw Per in swimming pool-DEF REFL*  
 b. Jeg kastet Per<sub>i</sub> i svømmebassenget hans<sub>i</sub> (locative).  
*I threw Per in swimming pool-DEF PRON*  
 c. Du dyttet hekse<sub>i</sub> i brønnen sin<sub>i</sub> (directional).  
*You pushed witch-DEF in well-DEF REFL*  
 d. Du dyttet hekse<sub>i</sub> i brønnen hennes<sub>i</sub> (locative).  
*You pushed witch-DEF in well-DEF PRON*

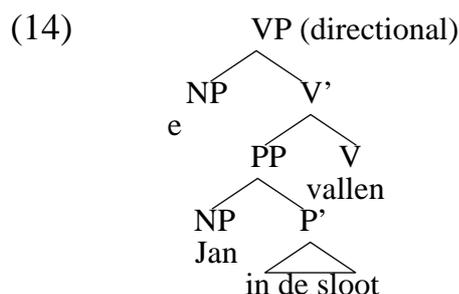
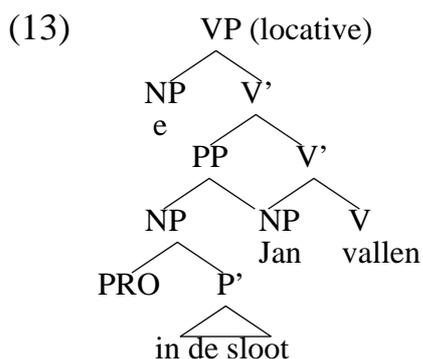
The sentences in (12 a, c) where the PP contains a reflexive, have only the directed motion reading, while (12 b, d), where the PP contains a pronoun are ambiguous between a located motion reading and a directed motion reading.

In addition, facts about the connection between syntactic structure and accent placement (cf. Hoekstra 1984, 1999, Cinque 1993, Truckenbrodt 1995) add emphasis to the claim that the two interpretations of these sentences project different syntactic structures.

### 2.5 Syntactic structure and accent placement

Hoekstra 1984 proposes that constructions where a verb selects a direct object and in addition also a locative or a Goal of motion PP should be analyzed in terms of small clauses. Although stated within a different syntactic framework, the proposal can easily be updated to fit in with more modern assumptions about syntactic structure. Specifically, Hoekstra argues that directional PPs appear as SC complements to the verb, while locative PPs appear as V'-adjuncts. Hoekstra's syntactic structures for the ambiguous sentence *dat Jan in de sloot valt* ('that Jan falls in(to) the ditch') are given in (13) and (14) (=Hoekstra's (44a-b), p. 243):

On the located motion reading in (13), the small clause PP is an adjunct with an empty PRO subject, while on the directed motion reading in (14), the small clause PP is a complement to the verb with a trace of the subject *Jan* as subject of the small clause.



In Dutch, but not in Norwegian, the position of the PP with respect to the verb can disambiguate the two readings of the sentence. If the PP *in de sloot* appears to the right of the verb, as in *dat Jan valt in de sloot* ('that Jan falls in the ditch'), the only possible reading of the sentence is one of located motion, whereas if the PP appears to the left of the verb, the sentence is ambiguous. This is expected on Hoekstra's approach, where the subject of the small clause PP on the directed motion reading of the sentence is a trace of the matrix subject *Jan*, which requires government, and can hence not be moved. On the located motion reading, on the other hand, the subject of the small clause PP is PRO, and nothing prevents the PP from appearing in postverbal position.

In a later paper (Hoekstra 1999), Hoekstra argues that accent placement can help in disambiguating the two readings of the sentence *dat Jan in de sloot valt* ('that Jan falls in the ditch'). While adjunct PPs receive an independent accentuation, in complement-verb constructions, the accent is placed on the lexical head of the complement. Hence, in Dutch, the placement of accent in a potentially ambiguous sentence like *dat Jan in de sloot valt* can help disambiguating the two different readings of the sentence.

The facts about accent placement in Norwegian are in fact quite similar to the ones for Dutch. Also here, the accent is placed on different positions in the sentence dependent on interpretation. The sentences in (15) show a few examples of this, where accent placement is indicated by capital letters:

- (15) a. Jon SYklet i GRØfta (located motion reading).  
       'Jon was biking around in the ditch.'  
       b. Jon syklet i GRØfta (directed motion reading).  
       'Jon biked into the ditch.'  
       c. Ballen RULlet i ÅKeren (located motion reading).  
       'The ball was rolling (around) in the field.'

- d. Ballen rullet i ÅKeren (directed motion reading).  
'The ball rolled into the field.'
- e. Per bar SYkkelen i gaRASjen (located motion reading).  
'Per was carrying the bike in the garage.'
- f. Per bar sykkelen i gaRASjen (directed motion reading).  
'Per carried the bike into the garage.'

However, despite the consistent differences in accent placement between events of directed motion and events of located motion, the actual connection between accent placement and syntactic structure still needs to be further developed, which has been done by Cinque 1993 and also by Truckenbrodt 1995.

Cinque 1993 outlines a general theory of phrase stress according to which, in the unmarked case, the main stress falls on the most deeply embedded constituent in syntactic structure.

Although the discussion of the exact structures for the two readings of the same sentence will be postponed until section 3, the assumption that on the directional reading, the PP is merged low down in the verb phrase as argument of a functional head Path (term due to Koopman 2000), while on the locative reading, the PP appears higher up in the structure is sufficient for the purposes of explaining the differences in accent placement.

With these structural differences in mind, we predict that on the directional reading of a sentence like *Jon syklet i grøfta* ('Jon biked in the ditch'), the accent should fall on the DP *grøfta* ('the ditch'), as the most deeply embedded constituent. As (15b) above shows, this fits well in with the observations. Thus, in the case of the directional reading of the sentence, Cinque's theory of stress placement gives the correct results for Norwegian.

But how well can Cinque's theory handle the accent placement facts for the locative interpretation? Consider again (15a). Here, we see that *both* the verb and the DP complement to the locative PP are accented. According to Cinque's stress placement rule, the accent should here fall on the verb, given the structural differences between directional and locative PPs. Still, Cinque's theory leaves unexplained the fact that on the located motion reading (= (15a)), not only the verb, but also the DP *i grøfta* is accentuated. How can this be accounted for?

Like Cinque, Truckenbrodt 1995 assumes stress placement to be dependent upon syntactic structure. Specifically, he proposes two different principles for stress placement; one for stress placement in complement-head

configurations, and one for cases in which one XP is outside of another XP, like eg. in adjunction structures. The two principles are repeated in (16-17) (= Truckenbrodt's (25) p. 175 and (28) p. 177) below:

- (16) In a complement-head configuration, head and complement enter into a single  $\emptyset$  headed by phrasal stress on the complement.
- (17) If XP is outside of YP and neither XP nor YP is contained inside a higher lexically headed ZP, XP and YP are phrased separately.

According to Truckenbrodt's principle in (16), the phrase stress in complement-head constructions is placed on the most deeply embedded constituent, exactly as predicted by Cinque. In addition, the principle in (17) predicts that in cases where the PP is not contained inside of the projection of the verb (like eg. in adjunction structures), the verb and the DP complement to the preposition are independently stressed, which (15a) shows is indeed the case.

Summing up, then, we have seen in this section that facts about VP constituency and adverbial placement, together with facts about the binding of anaphora and accent placement, all point in the direction that the two different readings of a sentence like (1a) project different syntactic structures, where directional PPs are merged low down in the verb phrase close to the verb and where locative PPs appear higher up in the verb phrase, modifying the whole event.

### **3. The analysis: two different structural positions for locative and directional PPs**

As we have seen in the preceding section, differences between locative and directional PPs support the hypothesis that the two types of phrases occupy different syntactic positions. In this section, I will outline an analysis which will be shown to handle the observed differences in a straightforward fashion.

Because it is beyond the scope of the present paper, the issue of functional projections will not be addressed here, but I will assume that in order to account for the observed ambiguities in interpretation, the following projections are necessary:

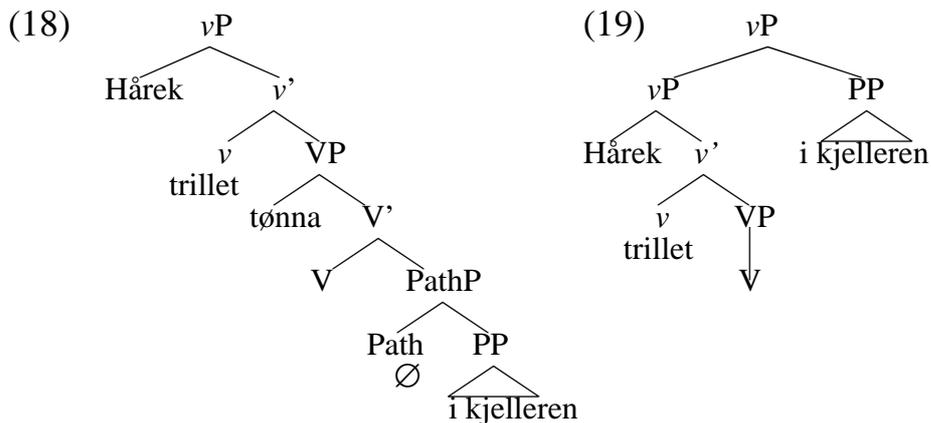
- (i) Verbs are decomposed into two subparts, a *causing projection*  $v$ , and a *process projection*  $V$  (cf. Hale and Keyser 1993). Transitive and unergative verbs always contain both of these projections, while unaccusative verbs do

not contain the  $v$  projection, which is responsible for the causation interpretation.

(ii) Koopman 2000 has suggested that prepositional phrases contain more functional material than meets the eye. Specifically, she argues that in the case of directional PPs, the extended projection of PP contains a functional head Path, in addition to various other projections. Following the spirit of her suggestions, I assume that the presence of a Path head is necessary on the directional interpretation of these sentences. The PP with  $i$  then appears as complement to the Path head. In case the Path head is not present, the PP with  $i$  appears as a  $v$ P-adjunct (or, in the case of unaccusative verbs, as an adjunct to the process projection, VP), and the interpretation is one of located motion.

### 3.1 Transitive verbs:

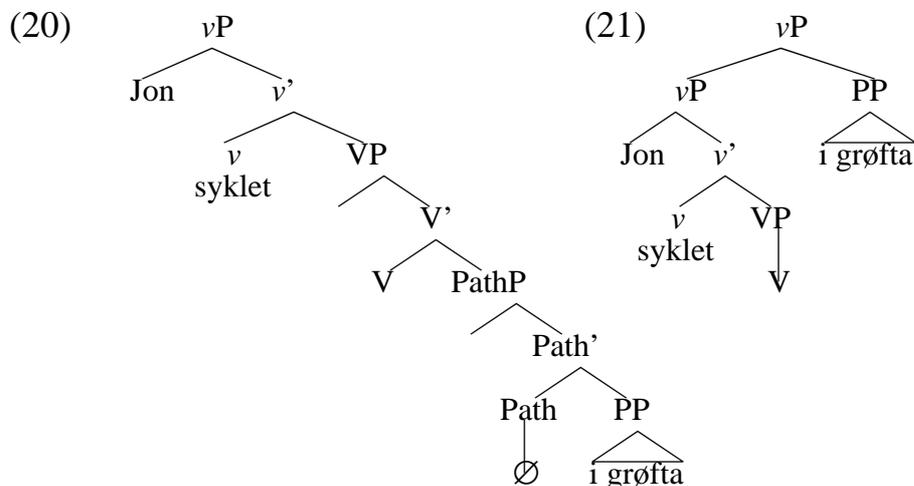
On the directional reading of a sentence like (3a), I assume that the verb takes a PathP complement with an empty head. The PP with  $i$  then appears as complement to the Path head, and the interpretation is one of directed motion, as in (18). However, there is also another possible reading of (3a), viz. the located motion reading. Since I assume the Path head in (18) to be responsible for predicating a path of motion and telos to the event, this head should thus not be present on the located motion reading of the sentences, where there is no endpoint to the event. Instead, on the locative reading, the  $i$ -PP appears as a verb phrase adjunct, modifying the whole event. The syntactic structure for the located motion reading of (3a) would then look like the one in (19):



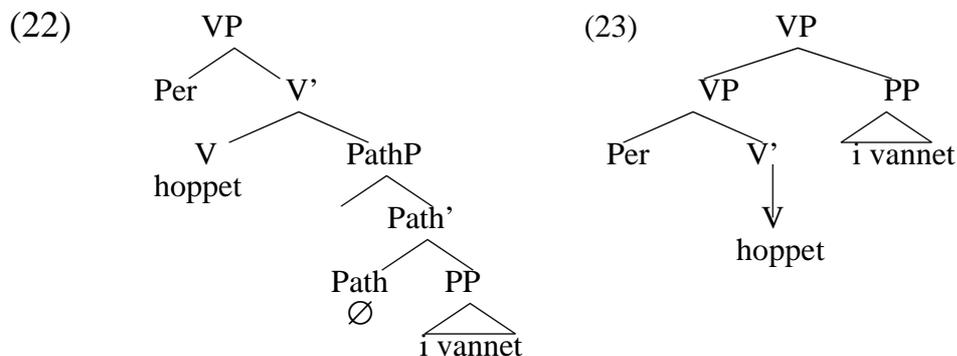
### 3.2 Unergative verbs:

With unergative verbs, both VP projections (ie.  $v$ P and VP) are present, and the subject of cause and the subject of process are identical. The argument

structure of the directional reading of the sentence (1a) would thus look like the one in (20), while, on the located motion reading, the PP *i grøfta* appears as a *v*P-adjunct, as in (21):



In the case of unaccusative verbs, I assume that since the notion of causation is not present, the *v*-projection responsible for the causation interpretation is missing. Again, on the directed motion reading, and the argument structure for a sentence like (2b) would look like the one in (22), while the argument structure for the located motion reading would look like the one in (23), with the locative PP appearing as a VP adjunct:



To summarize briefly, we have seen that for all types of verbs, in the case of the directed motion reading, the verb takes a PathP argument, which takes the PP with *i* as its complement. On the located motion reading, on the other hand, PathP is not present, and here again the *i*-PP appears as an adjunct to the verb phrase.

#### 4. Findings and conclusions

In section 2, we saw that the two readings of a sentence like (1a) pattern differently with respect to a variety of syntactic tests, and in section 3, we proposed an analysis of such sentences where directional PPs appear low down inside the verb phrase as complements to an empty functional head Path, while locative PPs appear as adjuncts to the verb phrase, modifying the whole event.

Here, then, we will try and draw the connection between the two preceding sections, and we will see that the proposed analysis is able to account for all the differences observed in section 2 above.

##### 4.1 *VP-topicalization and do so-substitution*

The argument structures for the locative and directional readings proposed in section 3 above give the desired results for explaining the observed differences between the two types of constructions with respect to VP-topicalization and *do so*-substitution. We observed that the sentences resulting from stranding the *i*-PP under VP-fronting or *do so*-substitution could only be interpreted as events of located motion, which follows neatly from the different syntactic structures assumed. While directional PPs appear VP-internally as complements of the Path head, locative PPs are adjoined to the verb phrase, and do not count as VP-internal. Hence, only locative PPs can be stranded under VP-topicalization and *do so*-substitution.

##### 4.2 *Ordering of adverbial PPs*

The relative ordering of adverbial PPs proposed by Nilsen 1998 lends further support to the view that directional PPs appear closer to the verb than locatives, but says little about the exact structural position of the two types of prepositional phrases.

##### 4.3 *Binding theory*

The different structures proposed in section 3 are also able to account for the observed differences with respect to the distribution of pronouns and reflexives. In section 2 we saw that sentences in which the *i*-PP contains a reflexive coreferent with the direct object are unambiguously interpreted as events of directed motion. Reflexives must be c-commanded by their binder, which is only possible on the structure proposed for the directional reading. A reflexive inside of a locative PP would, however, fail to be bound, since locative PPs appear higher up in the structure, as adjuncts to the verb phrase.

#### 4.4 Accent placement

According to suggestions by Cinque 1993 and Truckenbrodt 1995, the placement of accent is a consequence of the syntactic structure projected. Although vague with respect to the exact syntactic position of directional and locative PPs, the differences in accent placement between directional and locative readings of the same sentence add further support to the hypothesis that directional PPs appear closer to the verb than locative PPs. Thus, the structures proposed in section 3 can be seen to nicely account for all of the observed differences between the locative and directional readings of these sentences as outlined in section 2 above.

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