

Aspect and Verbal Prepositions

Gillian Ramchand and Mai Tungseth
University of Tromsø /CASTL

Abstract

In this paper, we explore some previously unanalysed interactions between verbal aktionsart and prepositional complementation in Norwegian, namely the alternations between a DP object and PP complements with *på* ‘on/at’ and *til* ‘to/at’. We argue that a simple account based on [\pm telic] or [\pm quantized] features cannot be correct. Instead, we generalize the notion of path and homomorphism, and integrate it in a syntactic theory of how complex events are built up compositionally. The path structure introduced by the PP interacts with the path structure of the VP to produce complex events based on ‘homomorphic unity’ in much the same way as has been argued for in the Verb + Nominal domain (Krifka 1992). Specifically, an extended location (a *på*-PP) in the complement of an activity verb (in our terms, a process subevental projection) gives rise to a non-directed path for the event; a point location (a *til*-PP) in the complement of an accomplishment verb (one which in our terms will contain a result subevental projection) gives rise to the specification of an endpoint.

1. Introduction

It is well known that the addition of a PP to a verbal predicate can affect the aspectual character of the VP as a whole (Vendler 1967, Dowty 1979, Jackendoff 1983). The addition of a PP goal phrase can shift an activity verb phrase to an accomplishment (goal of motion) interpretation. Conversely, in the case of transitive verbs of creation/consumption, the substitution of a PP instead of a DP that ‘measures out’ the event can lead to an obligatorily atelic construction, in what has been known as the conative alternation (Kiparsky (1998), Kratzer (2004)). Previous accounts of the conative alternation have involved a telicity feature, or a feature of quantizedness that gets transferred from the object to the VP (a transfer circumvented by the PP) (Kratzer 2004, Borer 2005). Goal of motion phenomena are also seen to involve some kind of telic feature or semantics, but this time it is *added* to the VP by means of the goal PP which augments the activity with a goal phrase (Higginbotham 2001, Levin and Rappaport 1998). While these

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accounts succeed in their own way, they are not immediately generalizable to other cases of PP augmentation where different verb classes are involved, and where the effects are more surprising.

In this paper we consider two cases of argument structure alternation in Norwegian which involve prepositional phrases in complement position. The alternations are shown in (1) and (2) below. In (1) an initially atelic transitive verb can take a *på*-PP complement instead of its usual DP complement, but remains atelic (see Herslund 1993, Durst-Andersen and Herslund 1996 for a discussion of this alternation in Danish).

Alternations with *på* ‘on/at’

- (1) a. Vi dyttet vogna.
we pushed cart.the
 ‘We pushed the cart’
- b. Vi dyttet på vogna.
we pushed at cart.the
 ‘We pushed the cart (around)’
- c. Hun bar chihuahuaen.
she carried chihuahua.the
 ‘She carried the chihuahua’
- d. Hun bar på chihuahuaen.
she carried at chihuahua.the
 ‘She carried the chihuahua (around)’

In (2) we see a telic (specifically, punctual) transitive verb trade in its DP object for a *til*-PP. Whereas the version with the DP object is ambiguous between a single occurrence telic reading and a multiple occurrence atelic reading (as with many semelfactive verbs as described in the literature (cf. Smith 1995)), the version with *til* gets an unambiguously single occurrence telic interpretation (see also Toivonen 2003 for Swedish).

Alternations with *til* ‘to/at’

- (2) a. Han slo eselet.
he hit donkey.the
 ‘He hit the donkey’
- b. Han slo til eselet.
he hit to donkey.the
 ‘He hit the donkey (once)’
- c. Hun sparka døra
she kicked door.the
 ‘She kicked the door’
- d. Hun sparka til døra.
she kicked to door.the
 ‘She kicked the door (once)’

In the literature we can distinguish two main strategies for capturing aspectual or argument structure generalizations. In one class of approaches, the generalizations are expressed in semantic terms within a ‘semantic module’ (Dowty 1979, Krifka 1992), or in a ‘lexical module’ for lexico-semantic representations (Jackendoff 1983, Levin and Rappaport Hovav 1995, Pustejovsky 1995). In the second class of approaches, the semantic generalization is translated into a syntactic ‘feature’ (e.g. [+telic], or [+quantized]) and subjected to syntactic mechanisms of checking in order to derive the distributional facts (van Hout 1998, Kratzer 2004, Borer 2005). In this paper, we will favour a more syntactic approach, but we will take a somewhat different view of the syntax-semantics interface than that embodied in the second set of approaches described above. We will argue firstly that the Norwegian data poses a challenge to the common wisdom concerning telicity and objecthood within the conative alternation as found in Kiparsky 1998, Kratzer 2004 for example. Instead, we will argue that the relation between syntax and semantics must be seen in terms of how the combinatorics of phrase structure systematically corresponds to semantic composition. In particular, we will argue that syntactic complementation in the verbal domain corresponds to event co-description which is constrained to be homomorphic.

In the first part of the paper, we establish the generalizations concerning these alternations in Norwegian which are not susceptible to previous accounts in terms of $[\pm\text{telic}]$ or $[\pm\text{quantized}]$ features.

2. Properties of the $p\ddot{a}$ construction

2.1. Distribution

In the use of $p\ddot{a}$ we are concerned with here, it typically appears with (transitive) accompanied motion verbs: the verbs in this class are atelic, but an endpoint can normally be added in the form of a directional prepositional phrase. In the versions with $p\ddot{a}$, no directional phrase is possible.¹

¹The $p\ddot{a}$ construction has received some treatment previously in the literature on Danish, which is in many respects similar to the Norwegian construction. Herslund (1993) states that the $p\ddot{a}$ -PP creates a kind of ‘semi-transitive’ structure, which “seems to highlight the activity reading” (p. 42) of a particular verb. Similarly, Durst-Andersen and Herslund (1996) analyse the alternation as a ‘transitivity’ alternation within the same lexeme, making a distinction between what they call an activity reading and an action reading (the latter of which seems to be closer in sense to Vendler’s accomplishment class). For them, activities have ‘lowered transitivity’ in some sense when compared to actions. While we agree with many of the generalizations, and sometimes the intuitions offered in these works, we will express the facts in somewhat different terms and give them a different formal representation. One salient difference is that we will not be taking the terms ‘transitive’ and ‘intransitive’ as unanalysed or primitive terms of the theory, but merely as descriptive labels. Our notion of verb-complement interactions will be more decompositional, and will allow us to express finer distinctions without relying on notions such as ‘semi-transitivity’ or ‘lowered transitivity’.

- (3) a. Han skjøv møblene.
he pushed furniture.the
 ‘He pushed the furniture’
- b. Han skjøv møblene ut
he pushed furniture.the out
 ‘He pushed the furniture out’
- c. Han skjøv på møblene (*ut).
he pushed at furniture.the out
 ‘He pushed the furniture (around)’
- (4) a. De flyttet koffertene.
they moved suitcases.the
 ‘They moved the suitcases’
- b. De flyttet koffertene opp på loftet.
they moved suitcases.the up on loft.the
 ‘They moved the suitcases into the loft’
- c. De flyttet på koffertene (*opp på loftet).
they moved at suitcases.the up on loft.the
 ‘They moved the suitcases (around)’

På can also appear with the class of predicates with ‘incremental theme’ direct objects, where the properties of the direct object determine the telicity of the whole predicate (in the sense of Krifka 1992). In these cases, the meaning difference seems to be quite similar to the English conative alternation:

- (5) a. Jens spiste et eple.
Jens ate an apple
 ‘Jens ate an apple’
- b. Jens spiste på et eple.
Jens ate at an apple
 ‘Jens ate at an apple’
- c. Jens malte et bilde.
Jens painted a picture
 ‘Jens painted a picture’
- d. Jens malte på et bilde.
Jens painted at a picture
 ‘Jens painted at a picture’

Continuing with the basic distributional pattern, we show in the examples below that stative predicates cannot participate in the alternation with *på*.²

²In the following example, the *på*-PP translated as ‘to the riddle’ is a distinct use of the preposition *på* which is irrelevant for the alternations we are discussing here. The important alternation concerns the possibility of replacing the direct object DP with *på*-PP.

- (6) a. Jens visste svaret på gåten.
Jens knew answer.the on riddle.the
 ‘Jens knew the solution to the riddle’
- b. *Jens visste på svaret på gåten.
Jens knew at answer.the on riddle.the
 (‘Jens knew the solution to the riddle’)
- c. Marit forstod spøken.
Marit understood joke.the
 ‘Marit understood the joke’
- d. *Marit forstod på spøken.
Marit understood at joke.the
 (‘Marit understood the joke’)

Perhaps more surprisingly, *på* cannot combine with achievement verbs, which are telic and punctual:

- (7) a. Hun drepte kjempeedderkoppen.
she killed giant.spider.the
 ‘She killed the giant spider’
- b. *Hun drepte på kjempeedderkoppen.
she killed at giant.spider.the
 (‘She killed at the giant spider’)
- c. Jens oppdaget en feil.
Jens discovered a mistake
 ‘Jens discovered a mistake’
- d. *Jens oppdaget på en feil.
Jens discovered at a mistake
 (‘Jens discovered at a mistake’)
- e. De nådde toppen av Mount Everest.
they reached top.the of Mount Everest
 ‘They reached the top of the Mount Everest’
- f. *De nådde på toppen av Mount Everest.
they reached at top.the of Mount Everest
 (‘They reached at the top of the Mount Everest’)

The pattern from distribution pairs activity verbs together with so-called accomplishments as a natural class, and excludes both states and achievements. Stating the common factor in terms of telicity, it seems as if the well-formed alternations require a verb that *can* have an atelic reading (as is the case with our incremental theme accomplishments, depending on the choice of object). The other way to state the generalization is in terms of eventivity and durativity: only verbs that are [+dynamic, +durative] can participate in the alternation. When we turn to our analysis, we will cash out this intuition in terms of verbs that project a subevent of ‘process’, but for now we content ourselves with the general intuition.

2.2. Effect on meaning

We can use the standard tests from the literature on aspectual classification to establish the precise semantic effect of the alternation. In particular, temporal adverbial PPs can be used to test whether an event is telic or atelic: ‘in an hour’ being felicitous with verbs that have a telic reading; ‘for an hour’ being felicitous with verbs that have an atelic reading. In the case of Norwegian, the relevant prepositional phrases are (confusingly): *på en time* ‘in an hour’ and *i en time* ‘for an hour’.

As we can see from applying the test to a simple motion verb like ‘run’, it is compatible with *i en time* ‘for an hour’ when unmodified, but compatible with *på en time* ‘in an hour’ when a goal phrase is added (8).

- (8) a. Jens sprang i en time.
Jens ran in an hour
 ‘Jens ran for an hour’
 b. Jens sprang til skolen på fem minutter.
Jens ran to school.the on five minutes
 ‘Jens ran to school in five minutes’

Applying this test now to our incremental theme verbs that showed the *på* alternation, we must first note the well known property these verbs have that their compatibility with ‘in an hour’ or ‘for an hour’ depends on the quantizedness of the direct object, as shown in the alternation in (9).

- (9) a. Han spiste suppe i en time/*på en time.
he ate soup in an hour on an hour
 ‘He ate soup for an hour (/in an hour)’
 b. Han spiste en skål suppe *i en time/på en time.
he ate a bowl soup in an hour on an hour
 ‘He ate a bowl of soup (*for an hour/) in an hour’

On the other hand, in the constructions where verbs of this class take a *på*-PP, the result is obligatorily atelic, even when the ‘object’ of *på* is quantized (as in the so-called conative alternation) (cf. also Herslund 1993, Durst-Andersen and Herslund 1996 who note this pattern with respect to telicity in their Danish data).

- (10) Han spiste på en skål suppe i tre minutter/*på tre
He ate on a bowl soup in three minutes on three
minutes
 ‘Jens ate at a bowl of soup for three minutes (/in three minutes)’

It is important to notice that while the properties of the DP object affect the telicity of the event with incremental theme verbs as seen above, this is not true for all the transitive verbs participating in the *på* alternation. For

transitive motion verbs, as in (11), the quantizedness of the object is simply irrelevant for the event structure properties of the VP—in both cases ‘for an hour’ is possible, while ‘in an hour’ is impossible.

- (11) a. Han dyttet vogner i en time/*på en time.
he pushed carts in an hour on an hour
 ‘He pushed carts for an hour (/ *in an hour)’
 b. Han dyttet vognen i en time/*på en time.
he pushed cart.the in an hour on an hour
 ‘He pushed the cart for an hour (/ *in an hour)’

Things do not change when we consider the versions which contain a *på*-PP instead of a DP object. The result is compatible with ‘for an hour’ and incompatible with ‘in an hour’ ((12)).

- (12) a. Vi dyttet på vognen i en time/*på en time.
we pushed at cart.the in an hour on an hour
 ‘We pushed the cart (around) for an hour (/ *in an hour)’
 b. De flyttet på koffertene i en time/*på en time.
they moved at suitcases.the in an hour on an hour
 ‘They moved the suitcases (around) for an hour (/ *in an hour)’

Putting the class of incremental theme verbs together with the transitive motion verbs, we can see that any account of the alternation that correlates the lack of quantization in the VP with the existence of PP structure cannot account for a pattern that generalizes to non-incremental theme direct objects as well. This is because the non-incremental theme objects do not affect the quantization of the VP in the first place, and this property is not affected by *på*. The meaning effect of the *på* alternation, if it is to be general, must be sought elsewhere.

Moreover, the *på* alternation does not actually apply to achievement predicates like *drepe* ‘kill’. Thus it cannot be that its primary function is to create atelicity out of telicity. Rather, the generalization seems to be that *på* will combine with a verb that can have an atelic process reading in the first place, but creates a different *kind* of atelic process from it. To see this difference most clearly, we turn again to the motion verbs. An important clue is that when *på* is present, a directional PP can no longer occur, although directionals are possible when these verbs combine with a DP object (again, facts also noted by Herslund 1993 and Durst-Andersen and Herslund 1996 for Danish):

- (13) a. Vi dyttet vognen til døra.
we pushed cart.the to door.the
 ‘We pushed the cart to the door’
 b. *Vi dyttet på vognen til døra.
we pushed at cart.the to door.the

Surprisingly, the $p\acute{a}$ -PP alternant is even ungrammatical with an inherently atelic directional PP, such as ‘round and round’. This shows that it is not merely that the $p\acute{a}$ -PP version is incompatible with the addition of an endpoint, it is also incompatible with any kind of path expression.

- (14) *Vi dyttet på vogna rundt.
we pushed at cart.the around

Thus, once again, it appears that the distinction here is not telic versus atelic, but some kind of directed versus nondirected motion. This situation is not unusual, but closely paralleled by data in Russian, where motion verbs are lexically distinguished as having ‘directed’ versus ‘non-directed’ versions. While *both* types are imperfective, only the directed verbal forms are compatible with directional prepositional readings. (See Romanova to appear for further data and discussion.)

- (15) a. Letučaja myš letit v spaljnju
flying mouse flies.DIR in bedroom.ACC
 ‘A bat is flying into the bedroom!’
- b. Letučaja myš letajet (*v spaljnju)
flying mouse flies.NONDIR in bedroom.ACC
 ‘A bat is flying around’

Romanova (to appear) analyses this alternation in terms of the non-directed motion verbs in Russian containing a ‘conflated’ path complement, which is potentially overlapping and crossing (a Z-path, in her terms). This analysis allows her to explain why nondirected motion verbs systematically lack complements of a certain type. In the case of Norwegian, the problem is similar. Not only must we express the fact that these verbs are incompatible with bounded paths, they are incompatible with any path expression at all. Under the view where path PPs can be freely added (in a language like Norwegian) to manner of motion verbs, this is surprising. The intuition we will pursue in the analysis section is that the $p\acute{a}$ -PP actually *is* a path argument of a certain kind (i.e. non-directed), and hence is in complementary distribution with any other path expression within the VP.

Extending this idea to the verbs with incremental theme objects, the effect of the $p\acute{a}$ -PP in (10) is to make the eating event more purposeless/nondirected. If we extend the notion of event path to include nominal objects in which each portion of the event is mapped systematically onto a portion of nominal ‘stuff’ (as in Krifka 1992), we see that the situation is parallel to that of the motion verbs. In other words, if the DP object constitutes a directed path for the event in Krifka’s sense (either unbounded or bounded) (in (9a) and (9b) respectively), then the $p\acute{a}$ -PP in (10) will be a non-directed path, one which has no measure related to nominal quantity.

To summarize, the intuition we wish to pursue is that the $p\acute{a}$ -PP attaches

to activity verbs as a path argument that is non-directed, i.e. potentially crossing and overlapping. The existence of an activity will be a prerequisite to taking a path complement, thus accounting for the distributional facts. We offer a formal analysis of the intuition in sections 4 and 5.

Before we do so, we examine a different construction where PP complements alternate with DP objects. This alternation is a conceptual partner to the *på* alternation described above, since it has some of the very opposite effects. One of our larger points is that interest in the conative construction in English and German has sometimes obscured the fact that not all DP/PP alternations are the same. A more fine-grained analysis of the relationship between V and PP complements is necessary, and is clearly affected both by the choice of verb and the choice of preposition.

3. Properties of the *til* construction

Now we turn to a description of the major syntactic and semantic properties of the *til* construction. The data and generalizations within this section are based heavily on Tungseth (2006), chapter 4.

3.1. Distribution

As we have seen, Norwegian also has a class of verbs which alternate between taking a DP object and a PP with *til*, ‘to/at’. The alternation with *til* seems to be limited to verbs of Levin’s (1993) *contact by impact* class, but these verbs can also be characterized as *semelfactive* (from Latin *semel*, ‘once’ and *facere*, ‘make’). These verbs are ambiguous between a punctual and a (repetitive) durative meaning.

- (16) a. Den ondskefulle bonden slo eselet.
the evil farmer.the hit donkey.the
 ‘The evil farmer hit the donkey’.
- b. Per sparket jerndøra i vilt raseri
Per kicked iron.door.the in wild rage
 ‘Per kicked the iron door in wild rage’.
- (17) a. Den ondskefulle bonden slo til eselet.
the evil farmer.the hit to donkey.the
 ‘The evil farmer hit the donkey (once)’.
- b. Per sparket til jerndøra i vilt raseri.
Per kicked to iron.door.the in wild rage
 ‘Per kicked the iron door in wild rage (once)’.

With these verbs, the object does not ‘measure out’ the event in any sense; a quantized object does not result in a telic interpretation, as indicated by the temporal adverbial with *i*, ‘in’, which goes with atelic events:

- (18) a. Bonden slo eselet i en time.
farmer.the hit donkey.the in an hour
 ‘The farmer hit the donkey for an hour’
- b. Per sparket døra i fem minutter.
Per kicked door.the in five minutes
 ‘Per kicked the door for five minutes’

Regarding the distribution of *til* with respect to the major verb types in the language, it is clear that a *til*-PP is not possible with unambiguously atelic verbs, like manner of motion verbs, as (19) shows:

- (19) a. *Hun kjørte til bilen
She drove to car.the
 ‘She drove the car’
- b. *Jens bar til chihuahuaen.
Jens carried to chihuahua.the
 ‘Jens carried the chihuahua’

On the other hand, a *til*-PP cannot appear with obligatorily telic verbs either.

- (20) a. *Slangen kvelte til rotta.
snake.the strangled to rat.the
 ‘The snake strangled to the rat’
- b. *Hun drepte til edderkoppen.
she killed to spider.the
 ‘She killed the spider’

The generalization here seems to be that the alternation with *til* is possible if the verb can express a punctual change, in addition to an iterative one. In other words, so far it seems to be restricted to verbs that have been traditionally classified as semelfactive (cf. Smith 1995).

3.2. Effect on meaning

The effect of the *til* alternant on the meaning of the form is quite easy to characterize intuitively for these verbs: the *til* alternant can only have a punctual interpretation. This can be shown most clearly by using the *Holdt på å* ‘held on to’ + VP test in Norwegian (cf. Andersson 1977, Platzack 1979, Norén 1996), which is sensitive to the presence of an endpoint. *Holdt på å* can be used to introduce an infinitival complement whose interpretation is systematically ambiguous depending on the aspectual properties of the VP.

- (21) i. If VP is a pure activity, only an ‘in progress’ reading is available.
 ii. If VP is an accomplishment, the reading is ambiguous between an ‘about to’ [event] reading and the ‘in progress’ reading.
 iii. If VP is punctual, only the ‘about to’ [event] reading is available.

When the verbs in question combine with a DP object, the VP is ambiguous between a punctual interpretation and an iterative one. Thus, with *holdt på å*, both the ‘in progress’ reading and the ‘about to’ reading should be possible. This is indeed the case, with the relevant examples shown in (22) below.

- (22) a. Bonden holdt på å slå eselet.
farmer.the held on to hit donkey.the
 (i) ‘The farmer was about to hit the donkey’.
 (ii) ‘The farmer was hitting the donkey’.
 b. Per holdt på å sparke jerndøra.
Per held on to kick iron.door.the
 (i) ‘Per was about to kick the iron door’.
 (ii) ‘Per was kicking the iron door’.

On the other hand, when the verb combines with a *til*-PP, only the ‘about to’ [event] reading is available, indicating that this version of the VP only has a punctual interpretation.

- (23) a. Bonden holdt på å slå til eselet.
farmer.the held on to hit to donkey.the
 ‘The farmer was about to hit the donkey’.
 b. Per holdt på å sparke til jerndøra.
Per held on to kick to iron.door.the
 ‘Per was about to kick the iron door’.

In fact, this generalization holds independently of the alternation with a DP object. A large class of *intransitive* semelfactives can also occur optionally with *til* with exactly the same semantic effect of forcing the punctual interpretation.

- (24) a. Blikket hans lynte av sinne.
glance.the his flashed of anger
 ‘His eyes flashed from anger’.
 b. Blikket hans lynte til av sinne.
glance.the his flashed to of anger
 ‘His eyes flashed from anger (once)’.

Thus, the verbs that can occur with *til* are vague between denoting single-occurrences (punctual, telic) and extended activities (atelic). When *til* is

present, only a punctual telic reading is possible. This effect is independent of the quantizedness (or not) of the direct object, and is even present in the absence of an internal argument.

A similar alternation with *till* in Swedish has been recently discussed by Toivonen (2003). One major difference between Toivonen’s approach and ours is that she follows Smith (1995) in classifying semelfactive verbs as [–telic, –durative, +dynamic]. In this system, the punctuality of semelfactives on their single occurrence reading is due to the negative durative feature, and not to a positive specification for telicity. The interpretation of the abstract feature system aside, the important point is that Toivonen ascribes the very same feature set to Swedish *till* as to the semelfactive verbs themselves. This makes it difficult to account for the obligatorily punctual reading of semelfactive verbs when *till* is added (i.e. the fact that one reading disappears). Regardless of what the Swedish facts happen to be, it is clear that the analysis will not carry over to the Norwegian data.

Moreover, we do not agree with either Toivonen or Smith with regard to the formal treatment of semelfactive verbs as [–telic]. Any detailed analysis concerning the features involved in the *til*-alternation must take a position on the controversial status of semelfactive verbs. In fact, we will follow the analysis of Rothstein (2004) in the analysis of this verb class, and use it to build our formal analysis. The next subsection lays out the details of the Rothstein (2004) account, and then shows that it makes the right predictions in terms of the additional verb classes that may occur with *til*.

3.3. The semantic characterization of semelfactives

As mentioned before, semelfactives have proved to be a tricky class of verbs to categorize within a traditional Vendler classification. Smith (1995) argues that the quadripartite classification of predicates into states, activities, accomplishments and achievements, which was first proposed by Vendler (1967), must be augmented by another class, namely the semelfactives. According to her, semelfactives are instances of atelic achievements. However, this treatment has been criticized by Rothstein (2004), who argues that on their base readings, semelfactive predicates are actually *telic* interval predicates which are joined under an operation of *S-summing* (or S-cumulativity) to form extended activities.

(25) **Definition of S-summing** (Rothstein 2004:151):

$$\exists e \exists e' [X(e) \wedge X(e') \wedge \neg e \sqsubseteq e' \wedge \forall e \forall e' [X(e) \wedge X(e') \wedge R(e, e') \rightarrow X^S(e \sqcup e')]]$$

The formula above says that two events that are in a subevent relation (\sqsubseteq) can form a ‘summed’ composite event (via \sqcup) under certain conditions. The condition for S-summing (which is distinct from iteration, the latter of which being possible for *all* atomic events) is that the base subevents are ones in which the starting point and the final point are identical (the

R relation in (25) above), thus facilitating concatenation (see also Kamp 1979).

The special distributional properties of *til* PPs require some explanation. The point is that unambiguously atelic verbs do not combine with *til*, and neither do unambiguously telic verbs. Thus, characterizing semelfactives as either basically atelic (as in Smith's account) or basically telic (as in Rothstein's) does not in and of itself solve the problem. It must be the special, highly specific properties of semelfactives that make them appropriate as input to the alternation. Rothstein's characterization of semelfactives as being verbs which can be telic, but which can be S-summed in the sense of (25) above to give an atelic reading, is, we believe, the criterial pair of properties.

The crucial piece of evidence for this characterization lies in its extension to another class of predicates which is superficially very different from the semelfactives. According to Rothstein (2004), *degree achievements* denote changes in degrees along a scale, where each change in degree is telic, but can also be conceived of as the starting point for the next change, making S-summing possible (See also Hay et al. 1999 for a characterization of degree achievements in terms of specific or non-specific degrees of change). If these are the semantic ingredients necessary for the alternation, then we would expect that degree achievements too should also be able to take *til*. In fact, this is the one other class of verbs we have found in Norwegian that undergoes the alternation.

- (26) a. Elva frøs over natta.
river.the froze over night.the
 'The river got more and more frozen during the night'
- b. Vinden frisknet utover dagen
wind.the freshened in.course.of day.the
 'The wind got stronger during the course of the day'
- (27) a. Elva frøs til over natta.
river.the froze to over night.the
 'The river got frozen overnight'
- b. Vinden frisknet til utover dagen
wind.the freshened to in.course.of day.the
 'The wind got strong during the course of the day'

The meaning effect of *til* here is once again to remove the ambiguity inherent in these verbs between an atelic and a telic reading. Under the atelic reading, the 'wind' in (26b) gets stronger and stronger with no contextually specified end. When *til* is added, as in (27b), the 'wind' undergoes a telic change, and simply gets 'strong', to a contextually specified degree.³

³Once again, we note here that the Toivonen (2003) account of *till* in Swedish cannot generalize to the degree achievement verbs. This is because she characterizes the crucial properties/features of *till* and the semelfactives they combine with as being [-telic, +dynamic, -durative]. The durativity of degree achievements makes them surprising

Taking both the semelfactive and the degree achievement cases together, our proposal will be that *til* blocks the possibility of an activity reading derived under S-summing, by explicitly expressing the existence of an endpoint, making the initial and final points of the event specifically distinct. We leave this as a semantic generalization in intuitive form for the time being, but will represent it more formally in a syntactic framework in the analysis section.

4. Constructing process and result

We have presented two alternations in Norwegian which pose problems for standard analyses of telicity as related to DP objects and PP complements. For both these alternations, we have shown that an analysis in terms of transfer of telicity from object (quantized) to event is not tenable. Moreover, the two PP alternations are crucially different: *på*-PPs create nondirected activities; *til*-PPs create VPs expressing change that has a specific endpoint. In order to account for these patterns, a more fine-grained view of how specific verbal predicates combine with specific PPs is required. We also believe that stating these alternations in terms of semantic meaning postulates or lexical redundancy rules is ad hoc in the absence of a systematic theory concerning the syntax-semantics interface. In fact, we think that certain well understood decompositions of the verb phrase combined with an understanding of the decompositional structure of prepositional phrases can give us the tools to understand these more subtle interactions between verbal and prepositional structure.

To do this, we first lay out our assumptions about the internal structure of verbs and prepositions. We will then look at what happens when complex verbal structures take prepositional phrases in complement position, characterizing the composed meanings we get in terms of a principle of homomorphic unity. Finally, in section 5, we will give our analysis of the structures we think underlie the *på* and *til* alternations, and show how it can account for the syntactic and semantic generalizations we have found.

4.1. Internal structure of VP: process > final state

We follow much recent work in claiming that certain complex verb types, accomplishments in particular, can be decomposed into process followed by result state (Dowty 1979, Pustejovsky 1991, Higginbotham 2001). Further, we assume that this decomposition is represented syntactically: process projections simpliciter can be distinguished from process projections which embed a result projection. There is evidence from modification that this kind of decompositional structure for the VP gives good predictions: below in (28), a repetitive reading of ‘again’ comes from modification of the

bedfellows for the semelfactives under that conception of things.

process; a restitutive reading of ‘again’ comes from modifying the result state.⁴

- | | | |
|------|--------------------------------------|-------------------------------|
| (28) | a. John opened the door again | <i>repetitive/restitutive</i> |
| | b. John painted the wall red again | <i>repetitive/restitutive</i> |
| | c. John found the gold again | <i>repetitive/restitutive</i> |
| | d. John ran again | <i>repetitive</i> |
| | e. John drove the car again | <i>repetitive</i> |
| | f. John drove along the river again. | <i>repetitive</i> |

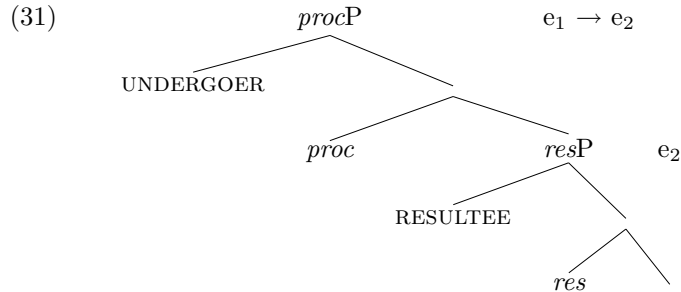
There is also evidence from predication for the existence of embedded result event projections. In particular, the addition of a resultative phrase can license ‘unselected’ objects, arguing for the augmentation of the simple verbal forms with a full small clause predicational structure corresponding to ‘result’ (see also Hoekstra 1988).

- (29) *John marched the children.
 John marched the children to bed.
- (30) *John handed the results.
 John handed the results in.

For concreteness, we adopt the phrase structure representation argued for in Ramchand (2006) to represent the internal decomposition of the verb. The lower part of that structure is shown in (31) below.⁵ The phrase structure contains a projection which is interpreted as the dynamic processual portion of the event, with its own specifier or ‘subject of process’—the UNDERGOER participant role. The process event can also embed a stative projection, the result phrase, with its own specifier position—RESULTEE, or ‘subject of result’. Event-event embedding is consistently interpreted as the ‘leads-to’ relation, giving a resultative interpretation to the combination of result state embedded under process. The participant roles are entailments over participation in the various subevents, and may be combined if a particular DP is Merged (Remerged) in more than one of these specifier positions.

⁴See von Stechow (1996) for an explicit argument from German both that the two readings require a representation in terms of scope and that there must be some syntactic analogue of a BECOME operator in the phrase structural representation.

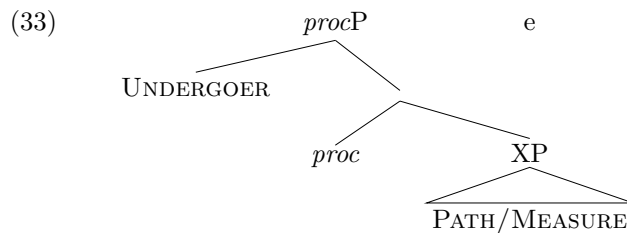
⁵In Ramchand (2006), there is also a superordinate initiation phrase which embeds process. This projection is not shown in the trees given here, since it does not interact with the phenomena we are looking at.



Not all verbs embed a whole result phrase projection with its own predicational structure. In the absence of a result phrase, the V can combine with an XP representing the path or the measure of the process. This gives the third possible participant relation that will be relevant to us here, that of PATH. A PATH XP co-describes the process event. The scale that is associated with it is mapped by homomorphism onto the run-time of the event. In the case of (32a), the scale is a spatial path; in (32b), the scale is also a spatial path but represented by a DP instead of a PP; in the case of (32c), the scale is the path of material ‘stuff’ that makes up the object and that gradually gets consumed during the course of the event. These latter are the classical ‘incremental theme’ verbs discussed in section 2.

- (32)
- a. John drove the car *to the store*
 - b. John walked *the West Highland Way*.
 - c. John ate *the apple*.

In all of these cases, the PATH argument in this sense is represented as the complement of process in the phrase structure (see Ramchand (2006) for further details of the system and its application to verb phrase types in English).



4.2. Homomorphism under complementation

Homomorphism between the event and the direct object has been claimed for certain DP objects (Krifka 1992), and recently for PP path complements by Zwarts (2006), accounting for the ways in which certain VP internal phrases affect the aspectual nature of that VP. For Zwarts (2006), event to PP mapping is mediated by the property of events that he calls ‘shape’, and

which tracks the dimension of change of the event with respect to location.

$$(34) \quad [[V PP]] = \{ e \in [[V]] : \text{shape}(e) \in [[PP]] \}$$

We agree with the intuition here, but believe that it is not general enough, since it does not carry over to DP incremental themes. For non-motion verbs, we extend ‘shape’ to be any monotone increasing function represented by the particular verb: namely, a property scale or a scale of degrees of material extent for creation/consumption verbs.

- (35)
- | | | |
|----|--|-----------------------|
| a. | John pushed the cart <i>to the store</i> | locational scale |
| b. | John dried the cocoa beans <i>bone dry</i> | property scale |
| c. | John ate <i>the mango</i> | material extent scale |

Under this view, the objects of accomplishments are special because they actually are PATHS, not UNDERGOERS, and this is why their quantizedness affects the aspectual properties of the VP. Thus, we claim that the notion of homomorphism is completely general for all complements of process that co-describe an eventuality. We express this in our principle of ‘Homomorphic Unity’ given below (see also Ramchand 2006).

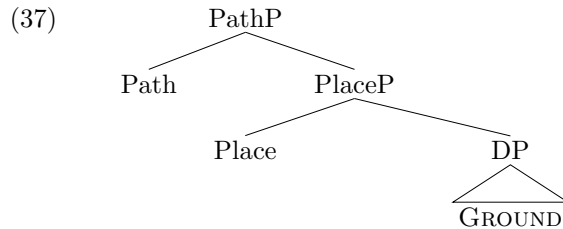
- (36) **Homomorphic Unity:** When two event descriptors are syntactically Merged, the scalar structure of the complement must unify with the scalar structure of the head by means of a homomorphism. (i.e. the relevant scales must be synchronized and unified to describe the complex event).

With this much structure to the VP in hand, we turn now to the syntactic and semantic properties of PPs.

4.3. Internal structure of PP: Path vs. Place

Following earlier results on the decomposition of PP, (van Riemsdijk 1990, Koopman 2000, Kracht 2002, Svenonius 2004), we assume the following decomposition of P to include at least a Path Projection which dominates a Place Projection for directional PPs. In languages where distinctive morphology is found, the place morpheme is always closer to the root than path morphology (cf. Kracht 2002, Svenonius 2004).⁶

⁶In the previous discussion of verbal decomposition, we used the term PATH to denote the generalized incremental complement relation. Here, the use of ‘Path’ is different, though related: ‘Path’ in the PP is a head and is part of the decomposition of the PP which could holistically be termed a PATH. The use of PathP here in the decomposition of P has its closest analogue in the *proc* projection of the verb phrase.



Not only is this decomposition syntactically and morphologically grounded, it also receives support in the compositional semantics literature. In Zwarts (2005) and Zwarts and Winter (2000), paths are constructed from place denotations in a compositional fashion. Within this system, it can be shown that Paths themselves can either be bounded (noncumulative) or unbounded (cumulative) (Zwarts 2005). The Path heads assumed in this system can be (at least) TO, FROM and VIA (according to Svenonius 2004). Thus, we can have pure PlacePs, without a Path component, but also bounded and unbounded paths. In many cases, especially in English, prepositions can be ambiguous between a PlaceP denotation and a PathP denotation. Some examples of the different types are given in (38) below.

- (38)
- a. *in the house* is a PlaceP
 - b. *into the house* is a bounded TO PathP
 - c. *toward the house* is an unbounded TO PathP
 - d. *under the bridge* is ambiguous between being a PlaceP or a bounded VIA/TO PathP.

The interesting point for the phenomena we are examining in this paper is not just the individual decompositions of prepositional phrases but also the ways in which different types of PP interact with verbal meaning to create complex predications. The interpretations that result turn out to be systematically dependent on both type of verb and type of preposition. We turn to an examination of these interactions in the next section, using simple examples from English.

4.4. Verbs and prepositions in combination

As expected, given the framework as set up so far, verbs that identify a process can combine with PathP to further describe the scalar structure of the change expressed by the predicate. The idea here is that a composite event description is achieved, respecting homomorphic unity. Thus, bounded paths will combine with process verbs to give telic processes, and unbounded paths will give rise to atelic processes (see Zwarts 2005 for analysis along these lines). We are assuming here that PPs headed by *to*, *into* and *towards* in English denote PathPs unambiguously.

- (39) a. John walked to the store. (telic; PP denotes bounded path)
 b. John walked into the room. (telic; PP denotes bounded path)
 c. John walked towards the station (atelic; PP denotes unbounded path)

Interestingly, stative verbs do not combine well with PathPs, indicating that scalar structure within the PP is incompatible with stative events (40).

- (40) *John sulked into the room.

In addition to combining with PathPs, process verbs can also combine with PlaceP to simply locate the process, with no contribution to scalar structure. Homomorphic unity is in effect, but vacuous, since the PlaceP expresses no internally structuring scalar relation.

- (41) a. John walked in the room (atelic, nondirected; PP denotes place)
 b. John walked under the bridge (ambiguous; PP denotes either path or place)

Stative verbs can combine with PlaceP to locate the situation. Homomorphic unity allows states to combine with static places unproblematically, as illustrated in (42).

- (42) John sulked in the room. (nondynamic; PP denotes place)

Given the verbal decomposition assumed above, there is one other logical possibility. If a particular verb decomposes into process followed by an embedded result state, then the position for prepositional phrases can be the complement of this lower subeventual head. Basically, if the event represents a transition into a final state, then there is a subevent e_2 such that e_1 ‘leads to’ e_2 where e_2 is a state. Under these conditions, a PlaceP complement of an e_2 state will locate the final state and therefore provide the endpoint of the event. This means that internally complex verbs of this type may get a so-called ‘goal of motion’ reading with pure PlacePs (purely locative prepositions), in the absence of path structure contributed by the prepositional structure itself. Compare the examples in (43) below with the examples in (44).

- | | | | |
|------|----|-------------------------------|-----------------------|
| (43) | a. | Mary danced to the store. | <i>goal</i> |
| | b. | Mary danced into the room. | <i>goal</i> |
| | c. | Mary danced under the bridge. | <i>goal; location</i> |
| | d. | Mary danced in the park | <i>location</i> |
| (44) | a. | Mary jumped to the store. | <i>goal</i> |
| | b. | Mary jumped into the room. | <i>goal</i> |
| | c. | Mary jumped under the bridge. | <i>goal; location</i> |
| | d. | Mary jumped in the water | <i>goal; location</i> |

In (43), the simple process verb *dance* must combine with a PathP in order to get a goal of motion interpretation—a goal of motion interpretation is impossible with pure PlacePs as headed by the English preposition *in*. On the other hand, the punctual verb *jump* in English has subevental complexity. On its punctual reading, the verb contains both a transition and an endpoint, and hence by hypothesis contains a result projection.⁷ For this verb, the locative preposition *in* in English can in fact give a goal of motion interpretation. It is important to note that under the atelic repeated activity reading of *jump* (the one derived by S-summing in Rothstein’s terms), the goal of motion reading with *in* is unavailable. Thus, (44d) can only mean that Mary ended up in the water as a result of one ‘jump’, not that she performed an extended sequence of ‘jumps’, and then ended up in the water. Under the multiple jumps (activity) reading, the only interpretation for the locative PP headed by *in* is that of locating the whole activity, just as in the *dance* example.

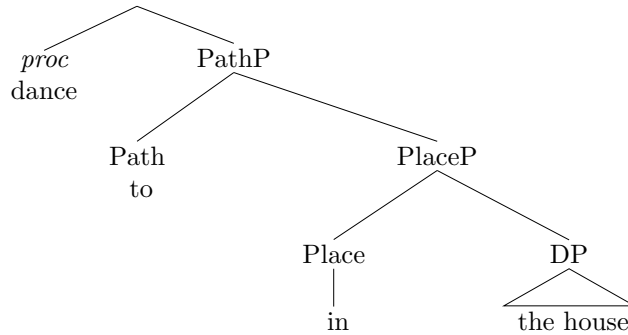
Thus, combining eventive decomposition with homomorphic unity allows us to understand why the possibility of ‘goal of motion’ constructions depends both on the preposition in question and also the verb type. Specifically, verbs in English that are obligatorily telic (punctual readings of semelfactive verbs for example) allow a purely locative PP (*in the water*) to name a *final* location, while activity process verbs like *dance* do not. Nor is this fact peculiar to English. Detailed investigation of the possibility of goal of motion interpretations in Korean, Farsi, Icelandic, Serbian and Czech have been undertaken as a part of the *Moving Right Along* project at the University of Tromsø.⁸ It appears to be a general fact that languages do not consistently allow locative PPs to express goal of motion, but restrict that possibility by verb type, with obligatorily telic (specifically punctual) verbs being most likely to do so.

In the trees that follow, we give phrase structural representations for the process verb *dance* in combination with the PathP *into the house*, and the semelfactive verb *jump* with the PlaceP *in the house*, respectively (where unpronounced copies are indicated by the use of angled brackets). Both VPs can express ‘the house’ as the goal of a directed motion, but with different internal ingredients. In (45), *dance* is a *proc* verb that combines with a bounded path; in (46), *jump* is a *proc, res* verb that combines directly with a place.

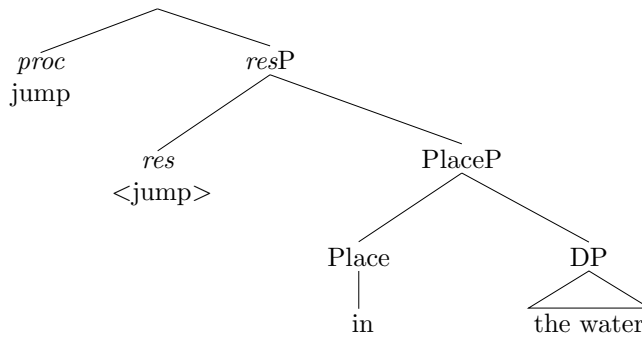
⁷The *again*-modification test fails for these verbs, in the sense that a restitutive reading (the one that is supposed to diagnose the result state) is unavailable. We assume that this is because of the independent property of semelfactives noted by Rothstein (2004), that the result state is indistinguishable from the start state. It is this fact that makes the S-summing possible in the first place, and which makes the modification of the final state infelicitous.

⁸The project is supported by an NFR grant to Peter Svenonius, and relevant data handouts can be found at <http://www.hum.uit.no/mra/>. The results from this seminar are also illustrated in the papers from this volume.

(45)

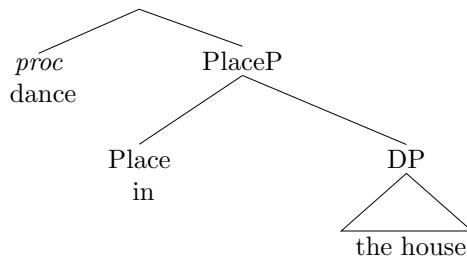


(46)



Conversely, a locative preposition (a PlaceP) gets radically different interpretations depending on whether it combines with a process verb simpliciter (47), or one which contains an embedded resultative state (46).

(47)



It is the combination shown above in (47) that gives rise to the possibility of non-directed motion.

5. Analysis

We now have the ingredients for an analysis of the Norwegian alternations discussed in the first half of this paper. We claim that both *på* and *til* denote PlacePs in these constructions, but differ in the type of verb that

they combine with.

To illustrate *på* first, what we find is a purely locative preposition meaning ‘at’ or ‘on’ with quite general and abstract semantics in many cases.

- (48) a. Jeg er på bussen
I am on bus.the
 ‘I am on the bus’
 b. Jeg er på Blå Rock
I am on Blue Rock
 ‘I am at Blue Rock (a pub)’
 c. Jeg er på jobb
I am on job
 ‘I am at work (in the process of working)’

As a preposition, *til* can either denote an obligatory bounded Path as in (49) or a location as in (50).

- (49) Han kjørte bilen til Tromsø
he drove car.the to Tromsø
 ‘He drove the car to Tromsø’
 (50) Bjørka sitter fast til klippen
birch.the sits stuck to cliff.the
 ‘The birch tree is stuck to the cliff’

One major difference between the two prepositions on their locative use is that *på* can represent a vaguely bounded or extended location, whereas *til* denotes a point with no relevant internal structure. This difference between the two locatives is preserved in their use when introducing temporal adverbial phrases. While *på en time* ‘for an hour’ locates an event occupying the whole extended interval ‘hour’, a temporal phrase such as *til klokka 7* ‘by 7 o’clock’ can only be used with a point-like temporal location to express some boundary.

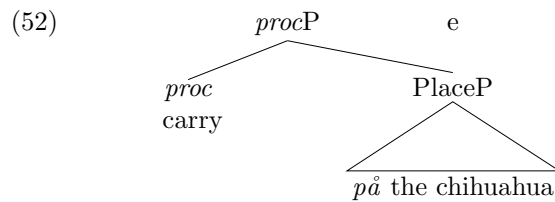
- (51) a. Han må lese hele boka på to timer.
he must read whole book.the on two hours
 ‘He must read the whole book in two hours’
 b. Han må lese hele boka til klokka to.
he must read whole book.the to clock two
 ‘He must read the whole book by two o’clock’

This distinction has been argued to have aspectual consequences in Tortora (2006), where the latter type of PlacePs are characterized as [+bounded] and the former as [–bounded]. Interestingly, if Tortora is right, there are aspectual distinctions internal to PlacePs, as well as internal to PathPs.

The relevance of this discussion for our analysis here is that *til*-PPs will be argued to be ‘non-extended’ PlacePs that combine with stative result projections to give an endpoint specification, while *på*-PPs are ‘extended’

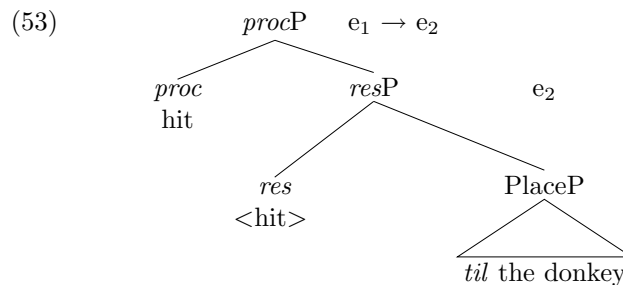
PlacePs, which can combine as locatives with dynamic *process* projections to give a non-directed interpretation.

The proposed phrase structural representation is shown in (52) below. The verbs that combine with *p̂* are activity verbs with process components. The *p̂* PP sits in complement position, removing the possibility of an independent Path complement and creating an obligatory nondirected process, by *homomorphic unity* (cf. (36) in section 4.2).



In this way, we account for why: (i) Only verbs with a process component participate in the alternation; (ii) Obligatory telic verbs are impossible, since they have a ResP which will block the *p̂*-PP in complement position; (iii) Directional complements are excluded; (iv) The interpretation is nondirected, since the *p̂*-PP is unambiguously locative.

On the other hand, the verbs that go with *til* are verbs with a process component which have an underspecified result, which allows S-summing. Adding a *til*-PP in the complement of Res gives a specified endpoint and removes the potential for S-summing. The proposed representation is given in (53).



This explains why (i) obligatorily telic verbs are impossible with *til* (because they already specify a particular result incompatible with *til* in complement of *res*); (ii) obligatorily atelic verbs are impossible with *til* because they do not allow a *resP* in the first place; (iii) the specified endpoint removes the possibility of S-summing.

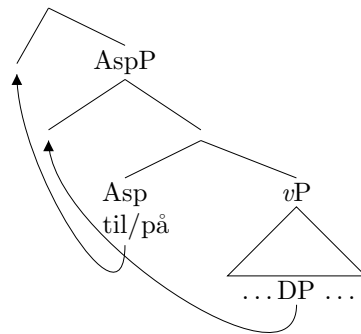
We note that even though both PPs denote places, only the *p̂*-PP seems to be compatible with an extended location, while *til*-PPs seem to force the ground of the preposition to be conceptualized as a point. We assume that this is the reason the PlaceP version of *til* cannot occur as the complement of process verbs to give a non-directed motion reading.

While our understanding of the internal aspectual semantic distinctions among different PlacePs is tentative at this point, we speculate that this type of ‘matching’ (i.e. process phrase with unbounded PlaceP, and result phrase with bounded PlaceP) will turn out to be yet another consequence of homomorphic unity, properly refined.

5.1. A Kaynean alternative

As a final point, we would like to discuss a possible alternative analysis of these facts along the lines of Kayne (2004), where prepositions are analysed as ‘probes’, which are merged relatively high in the phrase structure and which then attract the DP traditionally considered to be their complement. This analysis is initially attractive because of the clearly aspectual effects both of these prepositions have on the VP that surfaces, since (Outer) Aspect Phrases would normally be projected in a position higher than the verb and its arguments. If such an analysis were pursued, we would generate a tree such as the one shown in (54) below.

(54)



To get the surface word order, a number of movements would have to be postulated. First, the DP associate of the aspectual preposition would have to raise to the specifier of AspP. Secondly, the preposition itself would have to move to the left of the DP. Thirdly, the remnant *vP* would then move leftwards to the specifier of a higher projection where it would then c-command the remnant containing the preposition and its ‘complement’.

While we do not wish to take a stand here on the issues that surround the remnant movement approach to word order, we note that there are some straightforward difficulties that arise for this kind of account if the appropriate generalizations are to be captured. First of all, it is unclear how to express the distributional facts in this system. Under the most natural assumptions of the function of the aspectual higher projection, we would predict a distinction in terms of perfective or telic versus imperfective or atelic. However, as we have seen, the telic versus atelic distinction does not make the right cut when specifying which verbs combine with *på* and which

verbs with *til*. In particular, it would be hard to derive the restriction of the higher *til* prepositional probe to just semelfactives and degree achievements. The problem with *på* is similar, and complicated by the fact that the semantics of non-directionality has to be expressed somehow. Even if this were possible, it would be hard to derive the actual ungrammaticality of added directional phrases in this construction. An analysis that makes use of generalizations concerning the first phase of event building and argument structure seems to fare better here. The fact that the same distinction expressed by the *på* alternation is represented by a stem alternation in a language like Russian (cf. the discussion of (15) in section 2.2) is further evidence to us that an analysis in terms of *v*P-internal event building is to be preferred.

6. Conclusion and implications

In this paper, we have argued that the simple use of telicity and/or quantizedness features does not actually account for the Norwegian version of the conative alternation, although it is precisely this kind of alternation that is supposed to be evidence for such an approach. The alternation with *til* is in some sense the opposite of what such approaches might expect, where the addition of a PP actually enforces an obligatory telic reading, where the DP version was ambiguous. Capturing these patterns of distribution and semantic effect has relied on on a fine-grained syntactic decomposition of the verb phrase into process and result components, analogous to path and place in the prepositional domain. We have argued that PlacePs have predictable semantic effects when they are Merged in the complement position of process and result respectively. By homomorphic unity, an extended location in the complement of process gives rise to a spatially non-directed path; a point location in the complement of result gives rise to the specification of an endpoint. On a more general level, we think that the elaborate patterns of predicational interaction analysed here give support to our principle of *homomorphic unity*, which, if it is on the right track, is an important principle mediating syntactic and semantic composition in natural language.

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