

# Location and Locality

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abstract

An account of spatial semantics cannot fail to encompass three basic notions: location, change of location, and shape. While shapes can be considered to be properties of objects with a spatial dimension, locations and paths are relations between such objects. Most of the semantic and morphosyntactic literature, therefore concentrates on locations and paths. Without pursuing the intricacies of the semantics and logic of these notions, we take them to be basic and address the question of how these notions are reflected in syntax and morphology. There are indeed languages in which there is a direct grammatical correlate of the notions location and path. Accordingly, and following Jackendoff (1983) and Koopman (1993), we take the abstract structure of a spatial phrase in the verbal domain to be  $[_V V^o [_{PP} DIR^o [_P LOC^o [_N^o N^o ] ] ] ]$ . Our purpose here is to present new evidence for such a structure based on locality considerations. A robust notion of locality (heads involved in a syntactic relation R must be hierarchically adjacent) predicts  $\checkmark R(V, P^{DIR})$ ,  $\checkmark R(P^{DIR}, P^{LOC})$ ,  $\checkmark R(P^{LOC}, N)$ ,  $*R(V, P^{LOC})$ ,  $*R(P^{DIR})$ ,  $*R(V, N)$ .

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## 1. LOCATIONS AND PATHS<sup>1</sup>

### 1.1. Introductory Remarks

An account of spatial semantics cannot fail to encompass three basic notions: location, change of location (or path, transition, direction), and shapes. While shapes can be considered to be properties of objects with a spatial dimension, locations and paths are relations between such objects. See Levelt (1996) for enlightening discussion. But most of the literature, both semantic (cf. Asher & Sablayrolles (1994), Gruber (1965, 1976), Jackendoff (1983, 1990), Talmy (1983)) and morphosyntactic (cf. Bierwisch (1988), Hjelmslev (1935-37), Koopman (1993)), therefore concentrates on locations and paths. For our present purposes, without pursuing the intricacies of the semantics and logic of these notions, we will take them to be basic and turn to the question of how they interface with grammar. In other words, we will discuss a number of aspects of the way in which these notions are reflected in syntax and morphology.

From the perspective of morphology and syntax, one reason why space may not have been among the most prominent research topics is that in many of the more familiar languages the notions having to do with locations and paths are expressed by means of prepositions (or postpositions). These are closed class items and languages tend to have relatively few of them, often augmented by a few derived expressions, a type of complex prepositions of the type *in front of*. Adpositions show little or no overt systematicity in their shape or in their behavior. There is no property that *above* and *below* share to the exclusion of other prepositions, for example. And it is hard to see why Dutch distinguishes *achter* and *na* ('behind' and 'after'), but not 'in front of' and 'before' (both expressed by *voor*). In addition, there is an abundance of quite mysterious collocational restrictions: why are pictures 'on the wall' in English but 'at the wall' in Dutch?

Fortunately, there are a few languages that are more revealing in this regard. In particular, there are languages that yield evidence that there is a grammatical correlate of the notions location and path. More specifically, we will argue that there are syntactically and morphologically specifiable positions in grammatical structure which can be identified as location (LOC) and path (PATH or DIR). In the next two subsections we will discuss two pure cases of this, the 'extreme' morphological solution as found in Lezgian (section 1.2.) and the 'extreme' syntactic solution as found in German (section 1.3.). Section 1.4. translates these findings into an architecture for the morpho-syntactic representation of spatial expressions, essentially as follows:  $[_V V^0 [_{PP} DIR^0 [_P LOC^0 [_N N^0 ] ] ] ]$ .

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<sup>1</sup> The present article has grown out of research carried out in the framework of a discussion group in which Norbert Corver, Reinhard Muskens, Craig Thiersch and Elias Thijsse also participated. Early versions were presented by Van Riemsdijk to audiences at the University of Trondheim, Keio University, Tokyo, Tsukuba University and Hokkaido University, Sapporo. A version closer to the present one was presented by both authors at the Conference on Logic, Linguistics and Computation in Batumi, Georgia in September 1999 and at the 16<sup>th</sup> Annual Meeting of the Israeli Association for Theoretical Linguistics at Tel Aviv in June 2000. Our thanks to all these audiences for stimulating discussions.

In section 2. we turn to various types of evidence in favor of such structures. Specifically, we will address the question whether the relations between the four heads in question are constrained by locality. For example, could some rule or principle relate DIR and N if an intervening LOC is present? In this section, we present evidence that locality is obeyed at all levels. More specifically, we will examine the predictions that ensue from, on the one hand, a hierarchically ordered sequence of four heads (V - DIR - LOC - N), and, on the other, a robust notion of locality to the effect that only adjacent heads in such a hierarchically ordered sequence can enter into morphological or syntactic relationships, non-adjacent ones being blocked. In section 2.1. we discuss the positive prediction, that is, the prediction that the relationships N-LOC, LOC-DIR and DIR-V are permitted and are found. In section 2.2. we show that the relationships predicted to be impossible (N-DIR, LOC-V and N-V) are indeed not found.

## 1.2. The Morphological Extreme: Lezgian

It has been known at least since Hjelmslev (1935/37) that the most extended spatial case systems are found among the Daghestanian languages in the Caucasus. Hjelmslev's own work was on Tabassaran, renowned among connoisseurs for being the richest among them, though some of the others (including Lak, Archi, Tsakhur and Udi, cf. Schulze (1983, 1985)) are not far behind.<sup>2</sup> For our purposes, however, it will suffice to look at the comparatively limited system of Lezgian, not in the least because for this language there is an extensive modern grammar (Haspelmath (1993)).

A spatial expression in Lezgian is built up according to the following scheme.

- (1) stem - stem augmentative suffix - locative morpheme - path morpheme

An example of such a spatial expression is shown in (2).

- (2) *sew* - *re* - *q<sup>h</sup>* - *aj* (postrelative case)  
 bear - augm. - behind - from  
 'from behind the bear'

This part of Lezgian morphology, then, is entirely and transparently agglutinative, even to the extent that phonological interaction between the different morpheme slots is minimal. We need not be concerned with the stem-augmentative suffix here, but it emerges from an example like (2) that there is a strict separation between locative suffixes and suffixes expressing motion, direction, orientation, paths. As a matter of fact, the language has five suffixes to express different locations and three suffixes to

<sup>2</sup> Tabassaran is reported to have up to 48 locative cases. But, as will be seen directly when we examine Lezgian, the figure is misleading because it results from the combinatorial possibilities of far fewer suffixes. Where the 15 cases of Lezgian result from the combination of one morpheme slot with a three-way choice and another slot with a five-way choice, Tabassaran has  $7 \times 3 \times 2 = 42$  or  $8 \times 3 \times 2 = 48$  possible combinations (depending on whether one looks at the Southern or at the Northern dialect). See Comrie & Polinsky (1998) for details. These authors also report that Tabassaran is amply superseded in richness by Tsez. They analyze Tsez as having a  $7 \times 2 \times 4 = 56$  case system; furthermore, each of these combinations may or may not have the equative-1 case suffix added to it, bringing the total up to 112 distinct local case expressions.

express motion (including the Ø-morpheme to indicate absence of motion). This yields a 3x5 matrix and 15 spatial cases. Of these, for reasons unknown, one, the indirective ('into') is missing from the language. The overall system, then, can be represented as in (3).<sup>3</sup> The terminology for the case names is Haspelmath's.

(3)

	1st morph.:	AT	BEHIND	UNDER	ON	IN
2nd morph.:		<b>-w</b>	<b>-q<sup>h</sup></b>	<b>-k</b>	<b>-l</b>	<b>-Ø</b>
AT	<b>-Ø</b>	Adessive	Postessive	Subessive	Superessive	Inessive
FROM	<b>-aj</b>	Adelative	Postelative	Subelative	Superelative	Inelative
TO	<b>-di</b>	Addirective	Postdirective	Subdirective	Superdirective	(Indir.)

By way of illustration, here is a full paradigm of a noun with all the possible case forms:

(4)	Absolutive:	<i>sew</i>	the bear
	Ergative:	<i>sew-re</i>	the bear
	Genitive:	<i>sew-re-n</i>	of the bear
	Dative:	<i>sew-re-z</i>	to the bear
	Adessive:	<i>sew-re-w</i>	at the bear
	Adelative:	<i>sew-re-w-aj</i>	from the bear
	Addirective:	<i>sew-re-w-di</i>	toward the bear
	Postessive:	<i>sew-re-qh</i>	behind the bear
	Postelative:	<i>sew-re-qh-aj</i>	from behind the bear
	Postdirective:	<i>sew-re-qh-di</i>	to behind the bear
	Subessive:	<i>sew-re-k</i>	under the bear
	Subelative:	<i>sew-re-k-aj</i>	from under the bear
	Subdirective:	<i>sew-re-k-di</i>	to under the bear
	Superessive:	<i>sew-re-l</i>	on the bear
	Superelative:	<i>sew-re-l-aj</i>	off the bear
	Superdirective:	<i>sew-re-l-di</i>	onto the bear
	Inessive:	<i>sew-re</i>	in the bear
	Inelative:	<i>sew-re-aj ( sewräj)</i>	out of the bear
	Indirective:	-----	

<sup>3</sup> It would be a mistake to conclude from such a table that the semantics and use of these cases is as regular as their morphology. On the contrary. First of all, the language has a large number of postpositions as well, and many of these are primarily spatial in nature and are frequently used, perhaps more frequently than the spatial cases, to express purely spatial relations. Second, the spatial cases, when used in a purely spatial sense, often have a meaning that does not correspond directly to their place in the system. To cite one example (Haspelmath (1993:98)), the superessive expresses not only the location 'on' but also the direction 'onto'. Third, the spatial cases have many non-spatial uses. These may be temporal, of course, but also, for example, instrumental uses. The latter are primarily expressed by the addirective case, but also by the superdirective. Lastly, there are multitudes of instances where these cases are used in the manner of prepositional objects in apparently quite unpredictable ways. See also Comrie & Polinsky (1998) for a discussion of morphological vs. semantic transparency.

We may conclude that the morphological system of Lezgian has two neatly separated morpheme slots, one for Location and one for Direction.<sup>4</sup>

### 1.3. The Syntactic Extreme: German

Evidence that separate positions for Location and Direction must also be posited in syntax comes from complex adpositional phrases in German. An argument to this effect was originally presented in Van Riemsdijk (1990). In German, alongside 'normal' prepositional PPs such as (5)

- (5) a. auf dem<sub>DAT</sub> Tisch (on<sub>LOC</sub> the table)  
b. auf den<sub>ACC</sub> Tisch (onto<sub>DIR</sub> the table)

we also find PPs with two adpositional elements, usually one initial and one final, whence the name 'circumpositions.'

- (6) a. auf das Dach hinauf  
b. auf das Dach hinunter  
c. auf das dach hinüber

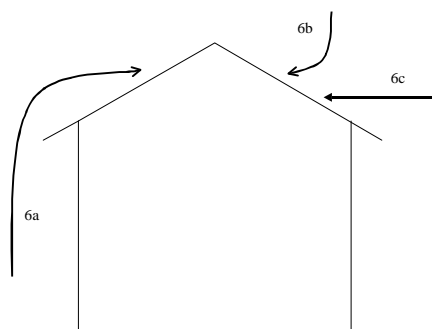
The postpositional element in these PPs consists of a locational adposition (auf = 'on', unter = 'under', über = 'over') with a deictic morpheme *hin-* or *her-* attached to it. *Hin-* means away from, and *her-* means towards, the speaker or the focal reference point in the conversation. The preposition indicates the location where the movement described ends, viz. on the roof, while the postpositional element describes the orientation of the path: *hinauf* for upward motion, *hinunter* for downward motion, and *hinüber* for a motion across from somewhere. Accordingly the meanings of the three PPs in (6) can be depicted as in (7).

<sup>4</sup> The three-way system for DIR in Lezgian is mirrored in languages like Finnish and Hungarian. But four-way systems are found as well. In such four-way systems, the fourth type of path is 'via', 'past'. Languages with such a system include Inuit (cf. Bok-Bennema (1991) and references cited there, in particular Bourquin (1891) and Warlpiri (cf. Hale (1986)). The terminology varies. One variant is: locative - allative - ablative - vialis; another: locative - terminalis - distantalis - prosecutive; and Hale uses locative - allative - elative - perlative. In view of the close conceptual similarity between space and time and the way these notions are expressed in language, it might be tempting to describe the four-way system in terms of two binary aspectual features that are independently motivated, for example:

	+ TELIC	- TELIC
+ INCHOATIVE	'via'	'from'
- INCHOATIVE	'to'	'at'

The idea is that the reference point is an end point ([+telic]) in the *to* case, a starting point ([+inchoative]) in the *from* case, and when being passed as in the *via* case it is both. But the suggested link to aspectual notions remains tenuous at best.

(7)

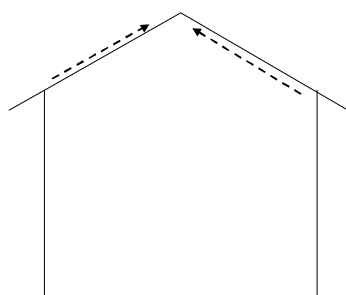


This seems to indicate quite directly that the preposition corresponds to LOC and the postposition to DIR. This is confirmed by examples in which the prepositional element is missing. The prediction would be that such examples describe the orientation of the path only, while being neutral with respect to the location. Indeed, consider (8).

- (8) Die Schnecke kroch das Dach hinauf  
 the snail      crept   the roof   up

This example means that the snail is engaged in an upward motion along the roof, but the location with respect to the roof is unspecified. First of all, it is not clear that the motion will ever end at some particular point (though, pragmatically, roofs tend to be finite in length/height). And second, the snail, due to its inherent properties, might be engaged in this upward motion on top of the roof or underneath it (cf. (9)). The fact that the snail must be in direct contact with the roof we again take to be determined by our knowledge of the physical world.

(9)



So far so good. These examples appear to present straightforward evidence in favor of two separate positions inside complex spatial expressions, one to express Location and one to express Direction or Path. We believe this to be the correct conclusion, even though in many cases the neat separation between LOC and DIR is blurred or simply absent. Take a simple case like (10).

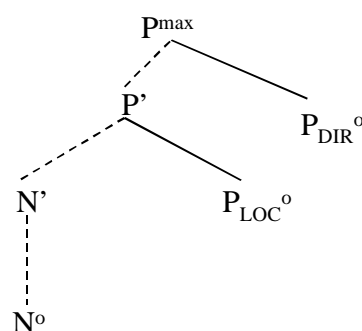
- (10) Auf das Dach mit der Antenne! ('Onto the roof with the antenna!')

Here, quite clearly, the top of the roof is the endpoint of the motion, and hence a path, though unspecified as to its orientation, is implied. Nevertheless, all of this seems to be expressed by the prepositional element alone, though we might, of course, assume the presence of a null-postpositional element.<sup>5</sup>

#### 1.4. The Functional Architecture of Extended Nominal Projections

On the basis of the above observations, we may conclude that spatial phrases have, in essence, a structure as given in (11), where the order of the functional heads may vary from language to language, and perhaps even within one language.<sup>6</sup> In this we follow, in essence, Jackendoff (1983), Koopman (1993) and Zwarts (1995). The overall approach takes as a point of departure the notion of extended projection, as developed in Grimshaw (1991) and Van Riemsdijk (1990), but the specific implementation we choose is the one proposed in Van Riemsdijk (1990, 1998b), in which intermediate phrases do not have the status of maximal projections. This is why there is no NP in (11). For details and arguments, the reader is referred to the references given.

(11)



We take this type of structure to underlie both the complex morphological spatial expressions of a language like Lezgian and the analytical, circumpositional, spatial phrases of a language like German. By way of illustration, we will assume that a circumpositional phrase like (12) is, essentially derived as in (13).<sup>7, 8</sup>

<sup>5</sup> Depending on the specific choice of adposition, other options may be simply unavailable. The generic directional preposition *nach* ('to'), for example, can only be used as a pure preposition and never has any kind of postpositional element associated with it. Others, like *zu* ('to') may take a postpositional element, as in *zu mir herauf* ('up and toward me'), but the deictic element can sometimes stand alone, as in *zu ihm hin* ('to him and away from the speaker'). It is not surprising to find such specific conditions associated with closed class items, and they do not affect the overall conclusions regarding the architecture of spatial phrases.

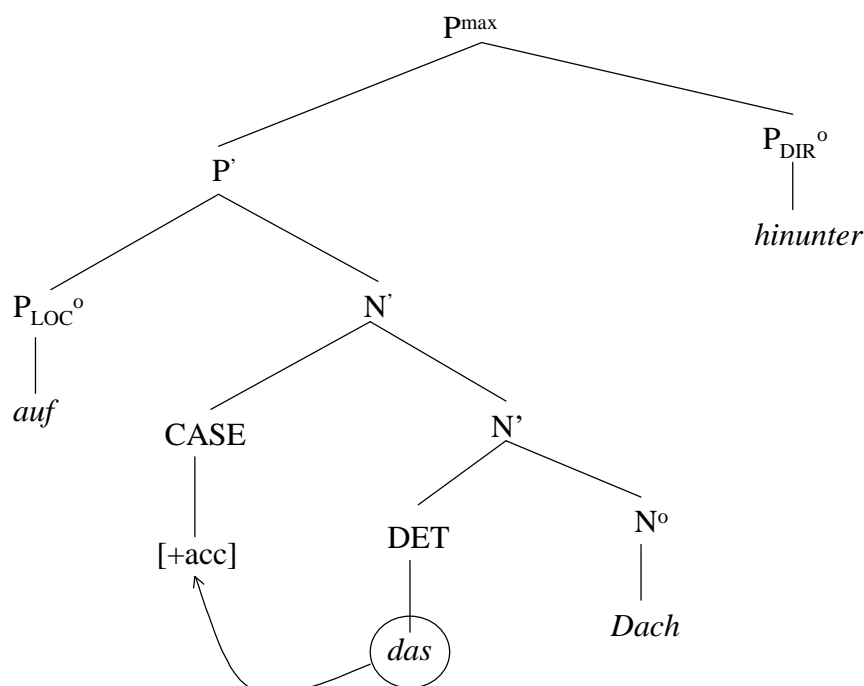
<sup>6</sup> We leave entirely open the question as to whether a universal word order should be assumed, with all variation being derived by movement processes, or whether language specific ordering (a directionality parameter of some kind) may be assumed.

<sup>7</sup> Again, we remain agnostic about the underlying order of the functional heads (head-initial vs. head-final) and consequently on whether any movement processes are involved in deriving (13). Similarly, nothing hinges on the specific implementation of case assignment/checking that is incorporated in (13).

<sup>8</sup> We ignore the question of where the deictic morpheme comes from and assume it to be part of the element filling the DIR-slot. It is tempting to speculate, however, that there might be an additional position involved here. Recall (footnote 2) that Tabassaran and Tsez are thought to have three distinct slots for the morphemes making up complex local case expressions, cf. Comrie & Polinsky (1998). In addition to LOC and DIR, Tabassaran has a slot for a morpheme which expresses the distinction

(12) auf das Dach hinunter

(13)



Similarly, we assume that a Lezgian spatial expression like (14) is derived in the manner shown in (15).<sup>9</sup>

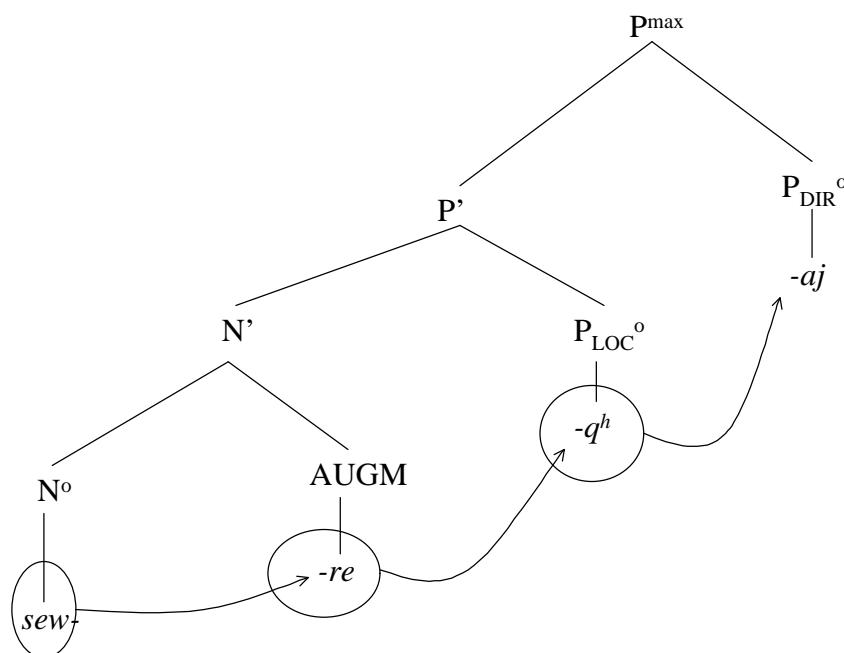
(14) sew - re - q<sup>h</sup> - aj  
 bear - augm. - behind - from

between 'precise location' and 'general location'. This is used to distinguish, for example, 'to' and 'towards', or 'from a precise point' vs. 'from the general area of.' We might call such a morpheme slot AREAL. In Tsez, this AREAL feature appears to be incorporated into the DIR series. But Tsez, in turn, has a third slot to express 'distal' (as opposed to neutral or close). This category of distality can be taken to be conceptually quite close to the *hin-/her*-distinction in German. We might, therefore, assume that there is a third functional position, call it DIST or DEIX, to accommodate such cases. Interestingly, the DIST position in Tsez is between LOC and DIR, which would be compatible with the situation in German.

<sup>9</sup> The remarks made in the footnote 7. apply here as well, though with one proviso. It has been argued in Van Riemsdijk (1998a) that adjunction of terminal elements to form agglutinative structures operates under strict linear adjacency. If that is correct, then a head-final structure such as the one depicted in (15) must be assumed to be underlying.



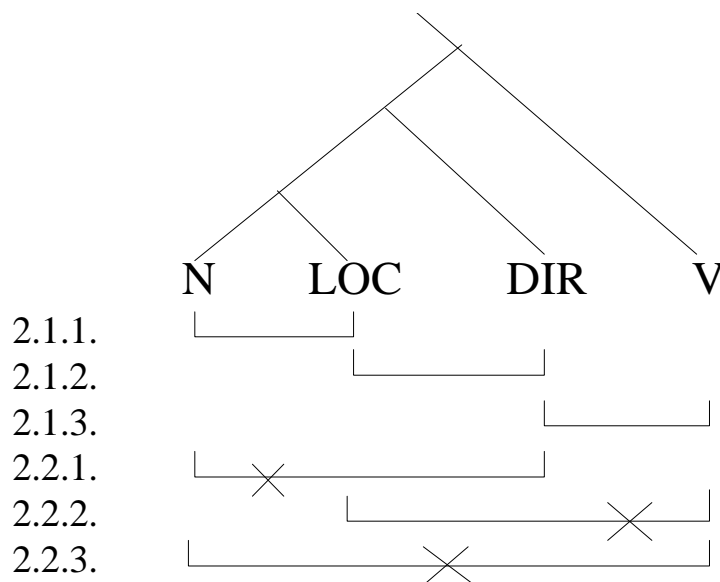
(15)



## 2. LOCALITY

We now turn to the relations between the heads posited in such an architecture. A simple notion of locality predicts that some of these relations can exist and that others are blocked. This can be schematized as follows:

(16)



In other words, we predict that the three adjacent links between these four heads are permitted, while the three non-adjacent relations are blocked by locality. In the remainder of this section, we will address the evidence that bears on these predictions. The relevant section headings are shown in (16).

## 2.1. What is allowed

### 2.1.1. N - LOC

It is a fact about English that pictures are ON the wall, not, for example, AT the wall or IN the wall. In Dutch, on the other hand, pictures are AT the wall (*aan de muur*). There may be deep reasons for such facts and such differences,<sup>10</sup> but for the time being we might as well say that there is a specific, and at least partly unpredictable, dependency between nouns such as *wall* and the preposition one has to use when talking about some object that stands in a particular spatial relation to it. With *wall* it is *on*, with *sentence* it is *in* (as in *there is an error in this sentence*), etc. The important fact, for our purposes here, is that once the choice of a locational preposition is fixed, the rest follows. In other words, in a directional context we say *put a picture on the wall* and *insert an error into this sentence*, not *\*put a picture at the wall* or *\*insert an error onto the sentence* (cf. also the discussion in section 2.1.3.). Thus, once the type of location is correctly selected, the choice of directional extensions is free (though it may depend on the verb, of course).

This type of dependency is particularly clear with geographical proper names. Holland is a flat country. And to many people, its minimal elevations are hardly noticeable. Nevertheless distinctions are made in the language along such dimensions. One example is the contrast between the Betuwe and the Veluwe. The Betuwe is an area between the rivers Rijn and Waal, two major arms of the Rhine delta. And the Veluwe is a sandy, heathy nature preserve north-east of the Betuwe. With the Betuwe, Dutch uses *in* ('in'), whereas with the Veluwe Dutch uses *op* ('on'). To those familiar with these areas or with some schooling in Dutch geography, this is not necessarily a surprise. The Betuwe, is entirely flat and it is bordered, both in the north and in the south, by massive dikes against flooding by the two rivers. From the perspective of those dikes, then, and even from the perspective of the rivers themselves, the Betuwe is a geographical depression, almost a valley. The Veluwe, on the other hand, could almost be considered mountainous for Dutch standards in that it features elevations of up to a few dozen meters. This being said, we must nevertheless note that people use the corresponding prepositions correctly even if they have never been there, never had any Dutch geography lessons at school, and only know that these are stretches of land where people can live, walk, ride, etc. So it is a piece of lexical knowledge, at least partly idiosyncratic, that we have the following contrast:

- (17) Jan woont **in** de Betuwe                      vs.            Jan woont **op** de Veluwe  
       ("John lives in de Betuwe")                      ("John lives on the Veluwe")

But once this contrast is lexically fixed, the choice of adpositions for the various paths follows automatically:

<sup>10</sup> In this case the crucial notion, presumably, is the fact that a picture on a wall is **in contact** with the wall. So, *on* is used even for ceilings, for example *there is a fresco on the ceiling*, even though, in a sense, the fresco is underneath the ceiling and certainly not on top of it. Similarly, the Dutch preposition *aan*, used for walls, can be used for ceilings as well. But the relevant type of contact is hard to define in view of the fact that a stain, physically almost impossible to distinguish from a fresco, is 'on the ceiling' (*op het plafond*) rather than 'at the ceiling' (*aan het plafond*). It remains to be seen how much of this is predictable from regular conceptualizations and how much is simply lexically encoded.

(18)	AT:	in de Betuwe	(in)	vs.	op de Veluwe	(on)
	TO:	de Betuwe in	(into)	vs.	de Veluwe op	(onto)
	FROM:	uit de Betuwe	(out of)	vs.	van de Veluwe	(from)
	VIA:	door de Betuwe	(through)	vs.	over de Veluwe	(over, across)

These are by no means isolated cases. In Finnish, we are told, cities differ as to whether internal or external cases are used.<sup>11</sup> Helsinki is referred to by means of internal cases, while Turku is used with external cases. The paradigm is as follows:

(19)	a.	Helsingi-ssä	in Helsinki	inessive
	b.	Helsingi-stä	out of Helsinki	elative
	c.	Helsinki-in	into Helsinki	illative
(20)	a.	Tampere-e-lla	at Tampere	adessive
	b.	Tampere-e-lta	from Tampere	ablative
	c.	Tampere-e-lle	to Tampere	allative

Similarly, it appears that the way in which the location Ukraine is referred to has been changed since the old regime was toppled and the Ukraine became independent.<sup>12</sup> The 'old' way was to say 'on the Ukraine' and 'onto the Ukraine' while now they say 'in the Ukraine' and 'into the Ukraine':

(21)	a.	на Украине na ukrainē on Ukraine <sub>prep</sub> 'on Ukraine'	vs.	на Украину na ukrainu on Ukraine <sub>acc</sub> 'onto Ukraine'
	b.	в Украине v ukrainē in Ukraine <sub>prep</sub> 'in Ukraine'	vs.	в Украину v ukrainu into Ukraine <sub>acc</sub> 'into Ukraine'

Finally, in Lezgian, Haspelmath (1993) reports that the location of certain Lezgian villages is rendered by means of the superessive, while the other villages as well as all non-Lezgian villages are referred to by means of the inessive. And again, the directional cases have to be chosen accordingly. One of the 'special' villages is Kasumkent. So, given that 'in Kasumkent' is expressed by means of the superessive, the notion 'from Kasumkent' is correspondingly expressed by means of the superelative:<sup>13</sup>

(22)	a.	Q'asumxür.e-l Kasumkent.AUGM-SUPER(-ESS) ("in Kasumkent")	b.	Q'asumxür.e-l-aj Kasumkent.AUGM-SUPER-EL ("from Kasumkent")
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<sup>11</sup> Again, some of this may have a conceptual origin: a larger city may be more easily conceptualized as having an interior than a small town, but once grammaticalized, if a small town grows into a big city, the grammar will not necessarily follow suit. In addition, there are morphological constraints. For example, place names ending in *-la* take the internal cases rather than the external ones. Thus, *Mikkola* takes the inessive *Mikkolassa* rather than the adessive *Mikkolalla*, probably as a result of some kind of morpho-phonological dissimilation.

<sup>12</sup> Thanks to Masha Yelenevskaya and Ben Hermans for pointing this out to us.

<sup>13</sup> Recall that the indirective constitutes an accidental gap. More generally, the directive cases are mostly used in temporal meanings in the present-day language. Other case forms tend to take over in such cases. Thanks to Martin Haspelmath (p.c.) for elucidating this point. This is why the directives have been omitted from the text paradigm.

Before we leave this topic, it should be pointed out that there are cases in which the precise nature of the path appears to be determined by the noun. As an example, consider the expression 'out of the blue' in the meaning of 'appearing quite suddenly with no apparent origin.' You might say that the relative path is certainly determined by the choice of the deadjectival noun *blue*. Indeed, there is no corresponding expression 'into the blue' nor 'in the blue'. But this does not count as a real counterexample since the location is lexically determined (that is, not free) as well. After all you cannot say 'from the blue' either in anything near the intended meaning. Hence, we have a tight lexical dependency ranging from N via LOC to DIR.<sup>14</sup>

We conclude that the lexical dependencies between specific choices of nouns and the spatial adpositions or cases that go with them confirms the proposed architecture for spatial phrases under a simple and robust notion of locality.

### 2.1.2. LOC - DIR

Turning now to the relation between LOC and DIR, consider the issue of mixed systems, that is systems in which free and bound morphemes interact, unlike in the 'pure' systems of Lezgian and German described in section 1. Given the fact that we have a binary choice both for LOC and for DIR, there is a total of four possibilities, as shown in (23).

(23)

	N	LOC	DIR	
1.	stem	bound	bound	Lezgian, cf. section 1.2.
2.	stem	bound	free	Navajo, cf. section 2.2.1.
3.	stem	free	bound	Turkish, cf. sections 2.1.2. and 2.2.1.
4.	stem	free	free	German, cf. section 1.3.

Cases 1 and 4 were discussed above. Case 2 we turn to in section 2.2.1. below. Here we focus on case 3. The most straightforward position to take on case 3 would be to say that it cannot exist. Indeed, if free morphemes that represent the category LOC are typically adpositions, and if adpositions are typically uninflected, then we predict that such structures do not occur. Let us see why this is so. The LOC-element, being free, will not attach to the noun. But what about the DIR-element? It must find a host, since it is a bound morpheme. But where can it find a host. By hypothesis, the LOC-element is an uninflected adposition, so it cannot serve as a host. And the noun is unavailable because of locality considerations: LOC intervenes between N and DIR. Given the assumptions, we believe this is the correct prediction.

Suppose, however, that the LOC element is inflectable. Then a totally different situation arises. For now, the bound DIR-element can attach to the free LOC-morpheme to be expressed. Typically, in such a situation the LOC-element is not an adposition but a nominal element.<sup>15</sup> This is indeed the situation that we find in Turkish and many other languages. Consider the following examples.

<sup>14</sup> We believe that this way of looking at things comes close to the notion of grammatical 'span' as developed in Williams (in prep.)

<sup>15</sup> This is not to deny the fact that such LOC-nouns are often degenerate nouns that may well have the status of adpositions in many relevant respects.

- (24) a. ağaç-tan  
tree-ABL ('from the tree')  
b. ağaç-ta  
tree-LOC ('in the tree')  
c. \*ağaç-ta-tan
- Turkish*

What these examples show is that the locative and the ablative case morphemes are in complementary distribution. Both cannot be adjoined to a single noun stem. This means that a DIR-morpheme, when used without a LOC-morpheme, can be a bound morpheme. The point, however, is that when both are present the LOC-morpheme must be a free morpheme, in fact a nominal element that requires the genitive case on the noun it modifies.

- (25) a. ağaç-ın arka-sı-ndan  
tree-GEN back-3sg-ABL  
(‘from behind the tree’)
- b. ağaç-ın arka-sı-nda  
tree-GEN back-3sg-LOC  
(‘behind the tree’)

What these examples show is that bound morphemes in an architecture like the one defended here must attach to an adjacent host. If no appropriate host is available in the adjacent position, either another element capable of hosting the affix must substitute for it, or there simply is no converging form available.

### 2.1.3. DIR - V

In assessing whether a syntactic relationship between DIR and V can exist, there are, as before, two main aspects to take into account: selection and movement. On the former, we can be brief. It is quite clear that many verbs select a directional complement. We have to be quite careful, however. Take a verb like *put* in examples like:

- (26) a. put the plate on the table  
b. put the problem behind you  
c. put the bird in the cage

The problem is that English PPs of the type used here are ambiguous between a purely locative meaning and a directional one. That the PP can be directional all by itself is shown by the PP-*with*-NP construction:

- (27) On the table with those plates!

That is, the PP does not need a verb to acquire the directional meaning. PPs can be disambiguated, of course, by means of the addition of *to*, but then we see a partial trade-off: when the governing verb (or the constructional context) explicitly imposes a directional meaning, the addition of *to* may feel somewhat redundant or contrastive in some cases:

- (28) a. ?put the plate onto the table  
b. ?put the bird into the cage  
c. Into the cage with that bird!

Things are somewhat clearer in a language like German, in which the two senses are differentiated by the choice of case: dative for locative expressions and accusative for

directional ones. And here we see that a verb like *stellen* (partly equivalent to *put*) takes directional PPs exclusively.

- (29) a. Er stellt den Teller auf den<sub>acc</sub> (\*dem<sub>dat</sub>) Tisch  
 he puts the plate on the table  
 b. Sie stellt den Stuhl unter den<sub>acc</sub> (\*dem<sub>dat</sub>) Tisch  
 she puts the chair under the table

Note, however, that the mild tradeoff that we observe here can be much more radical. In such radical cases, DIR is typically expressed as part of the verb, while LOC is expressed on the PP. Consider first an example from Classical Greek:

- (30) a. *kata-tithénai epi* chthonós (κατα-τιθέναι ἐπὶ χθονός)  
 down-put on floor ('put down on the floor')  
 b. *aph-ístamai (apò) basiléous* (ἀφ-ίσταμαι (απὸ) βασιλέως)  
 off - position from king ('distance oneself from the king')

In (30a) the element specifying the direction (*kata*) is attached to the verb as a prefix, while the location is expressed by means of the preposition *epi*, which is part of the nominal projection. In (30b) we have a case where LOC and DIR are conflated into a single preposition. Here we have the choice of just having a verbal prefix or having the prefix as well as a kind of copy of the same element in the nominal projection, thereby (artificially, as it were) separating out LOC and DIR.

Essentially the same situation is found in Latin, as shown in the following examples.

- (31) a. *extra fines e-gredi*  
 beyond the limits out-step  
 b. (*trans*) *flumen trans-nare*  
 across river across-swim
- (32) a. Caesar milites **castris in/eduxit** (Lehmann, 1992)  
 ('Caesar led his soldiers into/out of their camp')  
 b. Caesar milites **flumen traduxit**  
 ('Caesar led his soldiers across the river')

We leave open the question of whether this tradeoff is the result of head movement or of some lexical form of reduction of redundancy.

Turning now to Dutch and German, we observe that the DIR-elements that were discussed in section 1.3. can be attached to the verb. The following examples from German and Dutch show this.

- (33) a. ...weil sie das Klavier auf den dritten Stock hinauf hätten tragen sollen  
 because they the piano on the third floor upward had carry should  
 'because they should have carried the piano up to the third floor'  
 b. ...weil sie das Klavier auf den dritten Stock hätten hinauf-tragen sollen
- (34) a. ...omdat hij zijn fiets de vrachtwagen in wilde duwen  
 because he his bicycle the truck into wanted push  
 'because he wanted to push his bicycle into the truck'  
 b. ...omdat hij zijn fiets de vrachtwagen wilde in duwen

On most accounts,<sup>16</sup> the postpositional element originates as part of the directional PP, is separated from that PP and adjoins to the governing verb. Depending on the specific properties of the verb cluster and the language in question, the DIR-element may end up non-adjacent to its remnant PP somewhere inside the verbal cluster, as shown in the b-sentences.

Let us turn now to an even more radical case. Yucatec Maya is reported to lack the means of expressing direction as part of the nominal projection entirely (cf. Bohnemeyer (1998) and Goldap (1992)). That is, there is a neat separation: DIR attaches to (or is attracted by) V, while LOC attaches to (attracts) N. Consider first the pure locatives in (35).

- (35) a.           ti' le piinoh-o'                    b.           ti' u           pàach le piinoh-o'  
           Loc Def tree-D2                    Loc Poss.3sg Posterior Def tree-D2  
           'at the tree'                        'behind the tree' (literally: 'at back of the tree')

According to Bohnemeyer (1998), "inactive motion" verbs lexicalize punctual change-of-location of a figure (theme) with respect to a ground object but no continuous locomotion along a trajectory is defined with respect to the ground object. Put more simply, location is expressed as part of the nominal projection, but the path is expressed as part of the verb, though not in the form of a separate morpheme:

- (36) a.           le kàaro-o' h òok           ti' le kàaha-o'                    enter = go.to  
           Def cart-D2 Prv enter(B.3sg) in/Loc Def box-D2  
           'the cart entered [in] the box'
- b.           le kàaro-o' h hóok'           ti' le kàaha-o'                    exit = go.from  
           Def cart-D2 Prv exit(B.3sg) in/Loc Def box-D2  
           'the cart exited [in] the box'
- c.           le kàaro-o' ti' yàan           ti' le kàaha-o'                    exist = be.at  
           Def cart-D2 Prv exist(B.3sg) in/Loc Def box-D2  
           'the cart is in the box'

This separation, this division of labor between the verb and the nominal projection is so strong that it persists in the Spanish spoken by the Yucatec Maya, as pointed out in Lehmann (1992).

<sup>16</sup> It has occasionally been argued that the postpositional element is a verbal particle from the start and hence never a part of the PP. But if that were true, the NP would presumably have to be the direct object. In an example like (31), however, there already is a direct object, so we would have a kind of double object construction with the direct object preceding the second object. This seems highly implausible. For further discussion, see Van Riemsdijk (1978), Broekhuis (forthcoming). Among the relevant facts, note further that the directional object in an example like (34) cannot be passivized, even when there is no other object around:

(i)           \*De vrachtwagen werd in gereden  
               the truck           was into driven  
               'the truck was being driven into'

This example is instructive in yet another way. For *inrijden* does exist as a particle verb and as such has the meaning of 'breaking in' as said of a (new) car. And indeed on the meaning 'the truck was broken in' the example (i) is perfectly grammatical, cf. Van Riemsdijk (1978: 92).

- (37) a. el ratón **salió en** su agujero YM-Spanish  
the mouse left in its hole  
b. el ratón **salió de** su agujero Standard Spanish  
the mouse left from its hole

Consider now the question of how Yucatec Maya would express a trajectory with both an explicit starting point and an explicit goal such as (38).

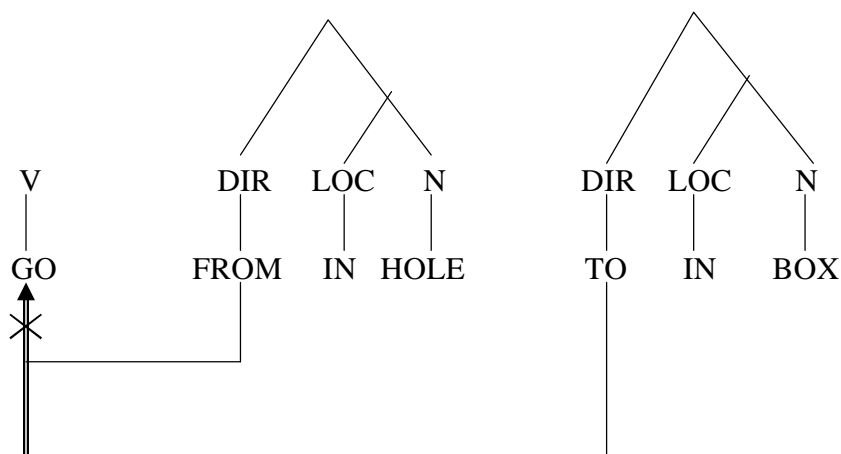
- (38) the mouse went from the hole into the box

The answer is that it is impossible to express this without having two full-fledged verbs. That is, a paraphrase of the type 'Juan left LOC-A; Juan arrived LOC-B' must be used:

- (39) a. le ch'o'-e' h **hóok' ti'** le áaktun-e';  
Def mouse-D3 Prv exit(B.3sg) Loc Def hole-D3  
b. (le ch'o'-e') h **òok ti'** le kàaha-o'.  
Def mouse-D3 Prv enter(B.3sg) Loc Def box-D2

If we interpret the unique presence of DIR on (or in) the verb as the result of a movement operation, that is, if we assume that DIR is incorporated into the verb, then this surprising fact follows directly from across-the-board (ATB) considerations. Consider, in fact, the following putative underlying structure:

- (40)



For both DIR-elements to incorporate into a single verb, they would have to do so in an ATB-fashion (cf. Ross (1986), Williams (1978)). But in order for that to be possible, they would have to be identical, which they are not. Hence, this derivation is not available.<sup>17</sup>

<sup>17</sup> Alternatively, one might assume that FROM and TO are incorporated in successive steps. But first of all, it is not clear how the two directional phrases could be interpreted in any way other than as



## 2.2. What is not allowed

As a cautionary remark, we would like to point out that claims about negative evidence must be taken with considerable grains of salt. We do not pretend to have studied large numbers of languages in search for counterevidence. Our main purpose here has been to suggest a new strategy of enquiry, one which we hope will help guide future typological research. We therefore believe the evidence presented below to be suggestive but not necessarily conclusive.

### 2.2.1. N - DIR

By hypothesis, a configuration in which DIR is attached (or at least adjacent) to N in the presence of LOC could only arise if DIR attracts N or if DIR is incorporated into N. Both processes are predicted to be blocked by locality. In order to see this, consider again the Turkish examples presented in section 2.1.2. above, repeated here as (41/42).

- |      |    |   |    |   |    |  |                |
|------|----|---|----|---|----|--|----------------|
| (41) | a. | ağaç-tan<br>tree-ABL ('from the tree')                                    | b. | ağaç-ta<br>tree-LOC ('in the tree')                                 | c. | *ağaç-ta-tan<br>tree-LOC-ABL ('out of the tree') | <i>Turkish</i> |
| (42) | a. | ağaç-ın arka-sı-ndan<br>tree-GEN back-3sg-ABL<br>(‘from behind the tree’) | b. | ağaç-ın arka-sı-nda<br>tree-GEN back-3sg-LOC<br>(‘behind the tree’) |    |  |                |

What would constitute counterevidence to our claim? Since the structure of Turkish extended nominal projections is agglutinative, we do not need to consider incorporation. Instead, we focus on attraction. Suppose, then, that the noun is attracted directly by DIR. We already know that the LOC and DIR morphemes are in complementary distribution. Indeed, (43) is as ungrammatical (or perhaps even worse) than (41c).

- (43) \*ağaç-tan-ta  
tree-ABL-LOC

But if we choose the analytical way of expressing the location, DIR can still not be attached to the head noun, regardless of whether we use a genitive or not:

- |      |    |   |    |  |
|------|----|---|----|--|
| (44) | a. | *ağaç-ın-dan arka-sı<br>tree-GEN-ABL back-3sg | b. | *ağaç-tan arka-sı<br>tree-ABL back-3sg |
|------|----|---|----|--|

In both cases, by hypothesis, LOC would have had to be crossed over in order for DIR to be attached directly to N. This, then, confirms our prediction.

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(asyndetically) coordinated. That means that successive instances of head movement, applied to each DIR-head separately, would violate the Coordinate Structure Constraint. This is, in fact, the essence of ATB-movement. In addition, it has been proposed that multiple incorporation is blocked as a matter of principle anyway (cf. Kayne (1994: §§ 3.3. & 3.4.)).

A somewhat more complex argument along similar lines comes from Navajo (cf. Kaufman (1992)). In Navajo, subjects agree with the predicate in person and number, as shown in (45).

- (45) a'áán tl'ée' Navajo  
 hole 3sgS.be.dark  
 'the hole is dark'

However, when the subject is a locational noun, it is also possible to use a special kind of locative agreement. If this mode of expression is chosen, LOC is either marked both on the noun and on the predicate, or on the predicate alone. Having just a locative 'subject' without overt locative agreement marking on the predicate is ungrammatical, as shown in (46).

- (46) a. a'áán-**góne'** **ha**-tl'ée'  
 hole-in Loc-be.dark  
 'it is dark in the hole'
- b. a'áán **ha**-tl'ée'  
 c. \*a'áán-**góne'** tl'ée'

For objects, an identical situation is found. In other words, alongside 'regular' person/number agreement with the object, as in (47a) it is also possible to have locative agreement with objects as in (47b-d). And again, agreement is obligatory, though the copy of LOC on the noun is optional.

- (47) a. ashkii bikooh yi-yii- ts  
 boy canyon 3sgO-3sgS.Perf-see  
 'the boy saw the canyon'
- b. ashkii bikooh-**góyaa** **hoo-** ts  
 boy canyon-down.in Loc-3sgS.Perf-see  
 'the boy saw the canyon'
- c. ashkii bikooh **hoo-** ts  
 d. \*ashkii bikooh-**góyaa** yi-yii- ts

Let us now turn to directional expressions. The DIR-marker *yah* is a free morpheme. And by hypothesis it intervenes between the locative marked noun and the predicate. Hence, we predict that in the presence of the DIR-marker locative agreement is blocked. As (48) shows, this is exactly right. The locative marker must appear on the noun, while agreement on the predicate leads to ungrammaticality.

- (48) a. ashkii hooghan-**góne'** *yah* íyá  
 boy house-in into 3sgS.Perf.go  
 'the boy went into the house'
- b. \*ashkii hooghan-**góne'** *yah* **ha**-íyá

### 2.2.2. LOC - V

We start examining this case by looking at an example that involves what might be called semantic incorporation. The verb *stay* strongly implies the presence of a location in which the staying takes place but that location need not be expressed

overtly. Suppose we assume, then, that LOC is semantically incorporated into such a verb, regardless of whether the location is also expressed overtly. Note now that with such a verb the origin explicating the situation before the staying starts cannot be expressed.

- (49) a. John stayed (here)  
 b. \*John stayed (here) from Rotterdam  
 c. John came from Rotterdam and stayed (here)

Such evidence is quite shaky, however, not in the least because it is very unclear whether any syntactic operation is involved in this type of semantic incorporation.

What would be a more syntactic piece of evidence? A very straightforward line of reasoning can be derived from the behavior of directional phrases in Dutch and German. For ease of reference (cf. section 1.3. and section 2.1.3.) we will concentrate on German here. German, like Dutch, has what is generally referred to as particle incorporation. Particle incorporation can apply both to locative and to directional particles. Consider (50/51). The b-sentence is the non-incorporated version, while the c-sentences show that the particle is attached to 'its' verb and has inverted into the verb cluster.

- (50) a. Du bleibst oben  
 you stay up(stairs)  
 b. ...weil du oben hättest bleiben sollen  
 because you upstairs had stay should  
 'because you should have stayed upstairs'  
 c. ...weil du hättest oben bleiben sollen
- (51) a. Du kommst herauf  
 you come upstairs  
 b. ...weil du herauf hättest kommen sollen  
 because you upstairs had come should  
 'because you should have come upstairs'  
 c. ...weil du hättest herauf-kommen sollen

With this in mind, there is an easy way to test our prediction. As was shown in section 1.3., German has a whole range of circumpositional phrases in which both a location and a direction are expressed. In view of the above examples (50/51) we might expect both the LOC and the DIR element in such circumpositional phrases to be available for incorporation into the verb. But in actual fact only DIR can incorporate, again in full obedience of locality.

- (52) a. Er springt [auf das Dach hinüber]  
 he jumps on the roof across  
 'he jumps across onto the roof'  
 b. ...weil er [auf das Dach hinüber] hätte springen können  
 because he on the roof across had jump could  
 'because he could have jumped across onto the roof'  
 c. ...weil er [auf das Dach \_\_\_ ] hätte hinüber-springen können  
 d. \*...weil er [ \_\_\_ das Dach hinüber] hätte auf-springen können

- (53) a. Sie fährt [unter der Brücke durch]  
 she drives under the bridge through  
 'she crosses underneath the bridge (driving)'  
 b. ...weil sie [unter der Brücke durch] wird fahren müssen  
 because she under the bridge through will drive must  
 'because she will have to drive through/underneath the bridge'  
 c. ...weil sie [unter der Brücke \_\_\_\_ ] wird durch-fahren müssen  
 d. \*...weil sie [ \_\_\_\_ der Brücke durch] wird unter-fahren müssen

We conclude that the pattern of incorporation possibilities encountered here is in full accordance with locality as applied to the architecture of locational phrases we are defending here.

### 2.2.3. N - V

This prediction, the impossibility of a direct relation between the noun in a locational expression and the verb, may well appear strange upon first consideration. After all, semantic selection does seem to apply between a verb and a noun even when the noun is in a locational expression:

- (54) a. dive into the pool vs. #dive into the surface  
 b. climb on(to) the top vs. #climb on(to) the horizon

The verb *dive* apparently selects locational objects that have an interior, and the verb *climb* selects locational objects which require vertical locomotion in order to reach them. But two remarks are in order here before we conclude that such examples constitute counterevidence to our claim. First, notice that both verbs actually subcategorize for an (optional) directional goal-phrase. In other words, the lexical specification of these verbs must also include the presence of DIR and LOC, hence, in that sense no locality violation is involved. Second, notice that what we are talking about here is semantic selection. Now, the real semantic content of a locational phrase is concentrated in the lexical head. The LOC and DIR elements, while by no means semantically empty, are quite bleached and unspecific in their meaning. It would not be unreasonable to assume that semantic selection ignores functional heads. In fact, this is what undoubtedly has to be assumed anyway. After all determiners do not block the semantic selection of the noun in a direct object construction either.<sup>18</sup>

Another way of approaching this issue is to examine noun incorporation in relation to nouns in locational expressions. The prediction, again, is quite clear: any such incorporation process should be blocked. We do in fact believe this to be the correct prediction, though we have not studied noun incorporation in any great detail. Baker (1988:81ff) does mention the fact that locatives sometimes appear to be incorporated. Baker cites the following Mohawk examples from Hewitt (1903):

- (55) H kare' n ñ' ia' -e- 'heñt - ra'ne' ka-'heñt-owan ' Mohawk  
 after now TL-3F-field-reached PRE-field-large  
 'Then, after a while, she reached a grassy clearing that was large'
- (56) O' na'karoñtot ' nene' karoñto' ne dji teieia-'hia-tha' ?  
 what PARTITIVE-PRE-tree-SUF PRE-tree-SUF where IMP-stream-cross-INSTR  
 'What kind of tree is used to cross the stream there?'

<sup>18</sup> For more extensive discussion, see for example Corver & Van Riemsdijk (to appear).

While some kind of semantic locatives do seem to be incorporated here, they are, in a sense, like direct objects too, as Baker remarks. Indeed, in English one would say *reach a field* or *cross a stream*. More significantly, there is no sign of any locative expression containing any visible trace of either DIR or LOC outside the complex verb. We may thus conclude, with Baker, that true locative noun incorporation does not exist, in conformity with the point we are making here.

### **2.3. Conclusions**

This concludes our survey of what elements can and cannot be directly related by syntactic processes in complex locational phrases. We have argued that an architecture of locational phrases in which the nominal projection is extended by a locative and a directional functional head, in that order, is well motivated, not only by the existence of morphological and syntactic patterns in which such a structure is quite apparent, but also from a variety of locality considerations.

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