

Adpositions, Particles, and the Arguments they Introduce

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Abstract

Spatial relations, and certain other relations among entities and events, are expressed in many languages by caseless, tenseless words that grammarians often call prepositions or postpositions (adpositions). In this article I make some general observations about these words and their role in providing thematic content and licensing to DP arguments. I refer generally to adpositions and related complementless particles as members of category P, and compare the category P to V, suggesting that they share some similarities in argument structure, but the temporal dimension of V distinguishes it fundamentally from P.

1 Introduction

This paper is a bird's-eye survey of some properties of adpositions and related expressions crosslinguistically. I discuss the general properties of the category P in §2. In §3 I suggest that the internal argument of P is universally a 'Ground,' or location, while the external argument is a 'Figure' or theme of location or motion, and that this pattern is as robust as the principle that Agents or Causers are external arguments of V, while Themes or Patients are internal arguments. The extent to which these generalizations should be extended to non-spatial senses of adpositions is briefly discussed in §4.

In §5, I propose that the split-V hypothesis, by which Causers or Agents are introduced by a head (v) distinct from the main V root (Kratzer 1996), be extended to P. In the split-P hypothesis, there is a functional head p , analogous to v , which introduces the Figure (Svenonius 2003). The sole argument of P is then typically the Ground.

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However, V has a richer range of possibilities when it comes to the introduction of arguments. I discuss this in §5 and propose a connection to tense. Tense, then, turns out to be a crucial property distinguishing P and V; more precisely, I suggest that Tense binds an *e* variable which is present in all verbs, and absent from all adpositions. I compare this defining quality of verbs with that proposed by Baker (2003), namely that verbs have specifiers.

2 P as a universal category

There has been much debate of whether categories like N, V, and A are ‘universal’ or not (see most recently Baker 2003). Usually such discussion revolves around whether all languages manifest these categories or not; if this is a necessary condition for a category being universal, then it is possible that P is not universal, as some languages are claimed to lack adpositions entirely (for example, Andrews 1975 on Classical Nahuatl, Holmer 1996 on the Austronesian language Seediq, Amritavalli 2002 on Kannada). However, the striking similarity of adpositional inventories in otherwise very different languages demonstrates that something about the human language acquisition device settles on the same solution for the same problem over and over again. In this sense, adpositions must be a direct reflection of UG (so-called universal grammar), even if the category is developed to differing degrees in different languages. There is of course a quantitative difference, as languages have inventories of verbs running from the low dozens (e.g. the Australian language Jaminjung, cf. Schultze-Berndt 2000) to the thousands (e.g. English), while prepositional inventories may contain zero members or one (e.g. the Amazonian language Wari’, according to Everett and Kern 1997) and may never reach much over a hundred (English again scoring high).

The smallness of the category P may indicate that it is a functional category. Whether this is so depends very much on theory-internal assumptions regarding what it means to be a lexical or functional category (cf. van Riemsdijk 1978). Given an explicit theory such as those of Marantz (2001) or Borer (2005) in which it is lexical categories which are associated with encyclopedic content, we might assume that P in a language like English must be lexical, since the meanings of certain P are so rich and nuanced. On the other hand, Baker (2003) argues at length that P is a functional category, based partly on the absence, cross-linguistically, of derivational morphology deriving adpositions from other categories, and partly on patterns of incorporation, among other things. I will tentatively assume, with Baker, that P is essentially a functional category, despite its association with encyclopedic information, though the assumption is not crucial in the account laid out here.

2.1 Adposition-like words crosslinguistically

The degree to which unrelated languages have similar-looking adpositional inventories is quite striking (though as mentioned above, there are languages

with a real paucity of adpositions). Consider, for example, the following sample, including postpositions (from Lakota, a Siouxan SOV language, and from 'O'dham, an Uto-Aztecan Aux-second language) and prepositions (from Persian, which is SOV, and from Chinese, which has mixed word order). The lists here are meant to be illustrative, not exhaustive.

- (1) a. 'O'dham (Zepeda 1983; Saxton and Saxton 1973)
- | | |
|-------------------------------------|---------------------------------|
| <i>am</i> 'at' | <i>dar</i> 'in' |
| <i>ab</i> 'at, on' | <i>bé</i> 'to' |
| <i>eda</i> 'in' | <i>az</i> 'from' |
| <i>wui</i> 'to, toward' | <i>bâ</i> 'with' |
| <i>we:m</i> 'with' | <i>bî</i> 'without' |
| <i>we:hejed</i> 'for (benefactive)' | <i>joz</i> 'instead of, except' |
| <i>da:m</i> 'on top of, above' | <i>barâ-yé</i> 'for' |
| <i>we:big</i> 'behind' | <i>taraf-é-</i> 'towards' |
| <i>weco</i> 'under' | <i>posht-é-</i> 'behind' |
| <i>hugidan</i> 'next to' | <i>dâhkel-é-</i> 'inside' |
| <i>ba'ic</i> 'in front of (person)' | <i>pîsh-é-</i> 'in front of' |
| <i>ba:šo</i> 'in front of (thing)' | <i>bêin-é-</i> 'between' |
| <i>ta:gio</i> 'toward' | <i>bîrûn-é-</i> 'outside' |
| <i>amjed</i> 'about, from' | <i>bedûn-é-</i> 'without' |
| <i>sa:gid</i> 'between' | <i>zîr-é-</i> 'under' |
| | <i>tû-yé-</i> 'in, on' |
- b. Persian (Mace 1962)

- (2) a. Lakota (Buechel 1939; Buechel and Manhart 2002)
- ógna* ‘in’
 - mahél* ‘in, within’
 - ektá* ‘at, in’
 - el* ‘in, to, unto, on’
 - etánhan* ‘from’
 - kicí* ‘with’
 - ob* ‘with (many)’
 - on* ‘of, with, by means of’
 - akánl* ‘on’
 - étkiya* ‘towards’
 - ohláteya* ‘under, beneath’
 - agláglá* ‘near, at the edge of’
 - kaglá* ‘by, near’
 - okó* ‘between’
 - ókšan* ‘about’
 - koáktan* ‘across, beyond’
 - ópta* ‘over, across’
 - opáya* ‘along’
 - égna* ‘among’
 - ohómni* ‘around’
 - óhan* ‘through’
 - ohómni* ‘around’
 - akótanhan* ‘on the other side of’
- b. Chinese (Li and Thompson 1981)
- zài* ‘at’
 - dào* ‘to’
 - yú* ‘to, for’
 - wǎng* ‘toward’
 - yóu* ‘from, be up to’
 - cóng* ‘from’
 - cháo* ‘facing’
 - chèn* ‘take advantage of’
 - jiù* ‘take advantage of’
 - yán* ‘along’
 - guānyu* ‘concerning’
 - zhìyu* ‘with regard to’
 - jù* ‘according to’
 - gēn* ‘with’
 - hàn* ‘with’
 - hé* ‘with’
 - lùn* ‘by unit measure’
 - bèi* ‘by’ (passive agent)
 - bǐ* ‘as’ (comparative)
 - lí* ‘apart from’
 - yòng* ‘with’
 - wèile* ‘for’
 - gěi* ‘for, to’ (benefactive, indirect object)

Furthermore, adpositional systems are often built up in compositional systems with explicit distinctions made among source, goal, location, and route, as in the following examples from unrelated languages, both postpositional (Northern Sámi) and prepositional (Zina Kotoko).

- (3) Northern Sámi (Nickel 1990)
- | | TO | AT/FROM | VIA |
|---------------|----------------|----------------|---------------|
| ‘in’ | <i>sisá</i> | <i>siste</i> | |
| ‘on’ | <i>ala</i> | <i>alde</i> | |
| ‘behind’ | <i>duohkai</i> | <i>duohken</i> | <i>duogi</i> |
| ‘under’ | <i>vuollái</i> | <i>vuolde</i> | <i>vuoli</i> |
| ‘in front of’ | <i>ovdii</i> | <i>ovddas</i> | <i>ovddal</i> |
| ‘beside’ | <i>beallai</i> | <i>bealde</i> | <i>beale</i> |
| ‘edge of’ | <i>rádjai</i> | <i>rájis</i> | <i>ráji</i> |
- (4) Zina Kotoko (Holmberg 2002)

	BE AT	TO	HAPPEN AT/FROM
‘in’	<i>a jí</i>	<i>(ná) jí</i>	<i>(má) jí</i>
‘on’	<i>a gmá</i>	<i>(ná) gmá</i>	<i>(má) gmá</i>
‘behind’	<i>a lyá</i>	<i>(ná) lyá</i>	<i>(má) lyá</i>
‘under’	<i>a mwá</i>	<i>(ná) mwá</i>	<i>(má) mwá</i>
‘near (person)’	<i>a ské</i>	<i>(ná) ské</i>	<i>(má) ské</i>
‘near (thing)’	<i>a zwa</i>	<i>(ná) zwa</i>	<i>(má) zwa</i>
‘in front of’	<i>a fká</i>	<i>(ná) fká</i>	<i>(má) fká</i>
‘among’	<i>a lwá</i>	<i>(ná) lwá</i>	<i>(má) lwá</i>

Also arranged along these lines are ‘local’ case systems, where the adpositional meanings are expressed by suffixes on the noun (examples here from Lezgian; conceivably, these suffixes are phonologically reduced postpositions, in which case this is not a third type).

(5) Lezgian (Haspelmath 1993)

	AT	TO	FROM
‘in’	<i>-0</i>	<i>-di</i>	<i>-aj</i>
‘on’	<i>-l</i>	<i>-l-di</i>	<i>-l-aj</i>
‘at’	<i>-w</i>	<i>-w-di</i>	<i>-w-aj</i>
‘behind’	<i>-qh</i>	<i>-qh-di</i>	<i>-qh-aj</i>
‘under’	<i>-k</i>	<i>-k-di</i>	<i>-k-aj</i>

As van Riemsdijk and Huybregts (2002) point out, a consistent feature of all such systems is that the determination of Place (‘in,’ ‘under,’ etc.) is closer to the DP, or lower in the functional hierarchy, than the expression of Path (‘to,’ ‘from,’ ‘via’), as in Jackendoff’s (1990) conceptual structures; in a prepositional language like Zina Kotoko, the Path element occurs first (‘to under the bed’), and in a suffixal language like Lezgian, it occurs last (‘bed-under-to’); even in Northern Sámi, this organization can be discerned, as the expression of Path can be understood as an inflection of the Place head (originally a local case inflection on a noun, as in Lezgian) (see also van Riemsdijk 1990; Koopman 2000; Zeller 2001; den Dikken 2003; Svenonius 2004 on the extended projection of P).

Thus, there is good evidence for a strong universal strain in the category P.

2.2 Identifying P in different languages

Of course, there is always the hazard when comparing different languages that one is simply seeing categories that one expects to see. What if, for example, the Chinese words identified as prepositions in §2.1 are really verbs, or the Northern Sámi words identified in §2.1 as postpositions are really nouns, which have simply been classified as adpositions because they translate English adpositions? What evidence is there that the languages in question have a distinct *category* P?

Such questions must be answered on a case-by-case basis, using language-internal diagnostics. Below I discuss the Chinese and Northern Sámi examples

in turn, but first set the stage with a brief discussion of English.

2.2.1 English

In English, there are various indications that P is a separate category from N, V, and A, as established by Emonds (1985). For one thing, there are constructions which seem to require a PP, for example the verb *dart*, as in (6), or the ‘PP *with* DP’ construction in (7).

- (6) a. The bird darted into traffic.
b. The dog darted after the cat.
c. The cat darted up the tree.
d. *The cat darted quickly.
- (7) a. Into the dungeon with those prisoners!
b. Back to England with those hooligans!
c. *Shackled with those prisoners!

In addition, there are modifiers, such as *right*, which select P and not other categories (though there are dialects in which *right* is used with a broader range of categories, for which (8d) is grammatical).

- (8) a. right into traffic
b. right back to England
c. right up the tree
d. *right quickly
e. *right shackled

Prepositions in English differ from verbs in not taking tense or aspect morphology (**overing*, **overed*), though some verbs have been coined from prepositions (*down*, *downed* ‘swallow’); and prepositions differ from nouns in not appearing with plural morphology (**intos*), though again nouns may be coined from prepositions (e.g. an *out* in baseball).

In fact, P appears to be an open class in English, in the sense that new members are being added. Words like *regarding* and *concerning* are now used with prepositional syntax, though they are not spatial and therefore do not appear in the ‘PP *with* DP’ construction, and do not appear with *right*. To see their special syntactic status it is necessary to compare them to verbs.

Verbal predicates in English can be used as adjuncts, in examples like (9). In this use, there is obligatory control of the implicit subject of the adjunct by the most prominent possible controller in the main clause, ordinarily the subject.

- (9) a. Running across the field, Patricia stepped on a mouse.
b. Aiming at the president, Vera shot a bodyguard.
c. Following the ambassador, Jane captured a spy.

In the examples in (9), only the subject can be a controller—Edwin must have been running, Margaret aiming, and Gloria following.¹ If there is no appropriate controller, the adjuncts are impossible.

- (10) a. *Running across the field, the grass was alive with mice.
b. *Aiming at the president, it was likely there would be an assassin.
c. *Following the ambassador, the streets were narrow and winding.

The controller for prepositional phrases, on the other hand, need not be the subject (cf. Huddleston and Pullum 2002). In fact, PPs often seem to be predicated of the event itself, in a sense (cf. Davidson 1967; Parsons 1990).

- (11) a. Across the field, Natasha could see a band playing.
b. With the presence of the president, it was likely that there would be assassins.
c. After the ceremony, wine and cheese were served.

Based on this observation, we can conclude that such words as *regarding*, *concerning*, and also *following* in the sense ‘after’ have prepositional syntax.

- (12) a. Owing to the earthquake, the grass was alive with mice.
b. Concerning the president, it was likely that there would be assassins.
c. Following the building boom, the streets were narrow and winding.

Since P does not appear with aspectual morphology, it seems most likely that *following* in this sense does not actually contain the verbal *-ing* morpheme observed in (9). Instead, the word has been ‘reanalyzed’ to join the category P. Possibly, *-ing* has been reanalyzed as a kind of degree head, since prepositions ending in *-ing* do not combine with *right* (**right following the building boom*, cf. *right after the building boom*).

An important lesson from the English case is that words may belong to several different categories, as *down* has been used to coin both noun and verb from its prepositional origins, and *following* is used as a preposition in addition to being a verb. Another is that language-specific tests are necessary to determine category membership.

¹Setting aside irrelevant constructions in which object-controlled VP-internal material is fronted, e.g. with perception verbs, which may be acceptable for some speakers.

- (i) a. Tanya saw a snake slithering across the field.
b. Slithering across the field, Tanya saw a snake.

2.2.2 Chinese

In tenseless serial verb languages like Chinese,² it can be difficult to distinguish between verbs and prepositions, so that for example *yòng* in (13) might be analyzed as heading a prepositional phrase ‘with a brush’ or heading a VP in a serial verb construction, ‘use a brush.’

- (13) Wǒ yòng máobǐ xiě zì.
I use/with brush write character
 ‘I use a brush to write characters’ / ‘I write characters with a brush’

For Chinese, Chao (1968) and Li and Thompson (1974, 1981) have argued for a category of preposition based on differing behavior of certain words, for example the fact that some words resist combination with aspectual particles like perfective *le* and durative *zhe*.

- (14) Wǒ gěi (*zhe) tā xiě xìn.
I to DUR 3SG write letter
 ‘I am writing a letter to him/her’

Ordinary verbs combine regularly with *zhe*, so *gěi* is different from an ordinary verb, and in a way that causes it to resemble the adpositions of other languages. Since its use and meaning contribution are also similar, Li and Thompson (1981) conclude that the category P exists in Chinese (its members are traditionally referred to as ‘coverbs’), though many of its members are ambiguously verbs. For example, *dào* in (15a) is a verb, because it appears with an aspect marker, but in (15b) the same word functions as a preposition.

- (15) a. Wǒmen dào le Xiānggǎng.
we arrive PERF Hong.Kong
 ‘We have arrived in Hong Kong’
 b. Tā dào Lúndūn qù le.
3SG to London go PERF
 ‘He/She has gone to London’

Just as with English, there are Chinese prepositions with vestigial aspect morphology, for example *wèile* ‘for’ and *chúle* ‘except’ which contain the perfective morpheme *-le* historically, but which no longer have perfective meaning (Li and Thompson 1981:362).

An examination of the list of Chinese prepositions in (2) reveals that many of the spatial relations familiar from English prepositions are absent, for example up, down, behind, below, and so on. In Chinese, these notions tend to be expressed by material following the DP, boldfaced in (16).

- (16) a. Tāmen zài fángzi hòumian xiūli diànshìjī.
they at house behind repair television

²All examples in this subsection are Mandarin Chinese and taken from Li and Thompson (1981) unless otherwise noted. I have also used Chao (1968), Li and Thompson (1974), Po-Ching and Rimmington (1997), and Po-Ching and Rimmington (2004) for information.

- ‘They repair televisions behind their house’
- b. Wǒ bǎ qiānbǐ chā zài píngzi **lǐ** tóu.
I BA pencil insert at vase in
 ‘I put the pencils in the vase’

Though they are in some sense nominal, these elements arguably constitute a distinct class of postpositions. They include words for ‘above’ (or ‘top’), ‘below’ (or ‘bottom’), ‘inside,’ ‘outside,’ ‘in front of,’ ‘behind,’ ‘left,’ ‘right,’ and so on (*shàng*, *xià*, *lǐ*, *wài*, *qián*, *hòu*, *zuǒ*-, and *yòu*- respectively) and often occur with a special set of suffixes (see e.g. Po-Ching and Rimmington 2004:124ff.). These postpositions apparently form a closer bond with the associated DP than do the prepositions, for example the preposition may incorporate into the verb.

- (17) a. Wǒ fang-le yi-xie shu **zai** zhuozi-shang.
I place-PERF one-CLASS book at table-top
 ‘I put some books on the table’
- b. Lǐ Sī ba zhei-ben shu fang-**zai**-le zhuozi-shang.
Li Si BA this-CLASS book place-at-PERF table-top
 ‘Li Si put the book on the table’ (Chinese; Sybesma 1999:46, 49)³

This means that Chinese order is the inverse of German, which has circumpositions in which the preposition forms a closer bond with the DP than does the postposition (e.g. *[[auf mich] zu]* ‘towards me,’ van Riemsdijk 1990). In both cases, the lower element might be called a Place head, the higher one a Path head, but for the exposition here I will continue to refer vaguely to all members of the extended projection of the adposition as P until §5.

2.2.3 Northern Sámi

For Northern Sámi,⁴ as with many other languages, the issue is that many postpositional elements are at least historically nouns with ‘local’ case-marking. Sámi has six cases, marked by a complex but regular combination of suffixation, diphthong simplification, and consonant gradation. A few examples of the *i*-stem paradigm are given in (18) (only singular forms are shown).

³I retain Sybesma’s glosses and orthographic conventions here; he represents what I am calling DP-postpositional sequences as N-N compounds, and glosses *-shang* as ‘top,’ though e.g. Li and Thompson (1981) generally write it *shàng* and gloss it ‘on’; in some contexts it corresponds to ‘above’ or ‘up.’

⁴All examples in this subsection are Northern Sámi and are from Nickel (1990) unless otherwise noted. I have also used Sammallahti (1998) and other materials. Thanks very much to Marit Julien and Kristine Bentzen for discussion.

(18)		‘fish’	‘lower part’	‘place’	‘space behind’
	NOM	guolli	vuolli	sadji	duohki
	ACC	guoli	vuoli	saji	duogi
	ILL	guollái	vuollái	sadjái	duohkái
	LOC	guolis	vuolis	sajis	duogis
	COM	guliin	vuliin	sajiin	dugiin
	ESS	guollin	vuollin	sadjin	duohkin

The forms for *vuolli* and *duohki* may be compared to the postpositional forms in the chart in (3) in §2.1; generally, the TO form is originally the illative, the AT/FROM form is occasionally the locative, and the VIA form is the accusative. The local cases illative and locative can be used in expressions of direction, quite generally.

- (19) a. Mun manan vissui.
I go house.ILL
‘I go into the house’
- b. Mun boadán viesus
I come house.LOC
‘I come out of the house’

The accusative form can be used as a genitive attribute (as in (20a)), and can also be used to express paths (20b).⁵

- (20) a. Áhči biila lea alit.
father.ACC car is blue
‘Father’s car is blue’
- b. Máret bođii dán geainnu.
Marit came this.ACC way.ACC
‘Marit came this way’

Thus, the following examples might be interpreted as involving nouns, rather than postpositions, as suggested by the glosses and translations here.

- (21) a. Heasta ruohtai viesu duohkai.
horse ran house.ACC space.behind.ILL
‘The horse ran to the space in back of the house’
- b. Dat ruohtai viesu duogi.
it ran house.ACC space.behind.ACC
‘It ran along the space in back of the house’

Alternatively, we could identify *duohkai* and *duogi* as postpositions, as suggested by the glosses and translations below.

- (22) a. Heasta ruohtai viesu duohkai.
horse ran house.ACC to.behind

⁵Sámi grammars such as Nickel (1990) regularly identify this morphological form as accusative/genitive, and distinguish between ‘accusative’ uses and ‘genitive’ uses. Since there is never any morphological difference, I call both sets of uses accusative.

- ‘The horse ran behind the house’
 b. Dat ruohtai viesu duogi.
it ran house.ACC via.behind
 ‘It ran along behind the house’

There are several indications that the latter analysis is more correct than the former. For one thing, there are phonological differences; compare the postpositional *duohkai*, with a short vowel, with the illative case form *duohkáái*, with a long vowel, for example, or the postpositional *duohken* with the essive nominal *duohkin*. In fact many of the postpositional forms are not contemporary case forms at all, but preserve old case forms no longer used with nouns. For example, *vuolde* ‘at or from beneath,’ illustrated in (23b) (compare the case table in (18); see Sammallahti 1998:67 for specifics on the historical development of *vuolde*).

- (23) a. Bija daid beavddi vuollai!
put those table.ACC to.under
 ‘Put those under the table!’
 b. Dat lea beavddi vuolde.
it is table.ACC at.under
 ‘It is under the table’
 c. Johka golgá eatnan vuoli muhtun saji.
river runs earth.ACC via.under some places
 ‘The river runs underground in some places’

Another indication that the postpositions are no longer nouns is that their meanings have diverged. In fact, *vuolli* does not generally appear as a noun in modern Northern Sámi, except in compounds, or with the specialized meaning ‘lower part of a river,’ and *duohki* when used as a noun now typically has the meaning ‘background.’

Furthermore, many of the adpositions have acquired meanings that the corresponding nouns do not have, for example *duohkai* also has the meaning ‘in [someone’s] control,’ for example of money or authority.

- (24) a. Váldde daid ruđaid duohká-sat.
take those monies to.behind-2SG.POSS
 ‘Take the money into your possession (for safekeeping)’
 b. Dat čievččastedje buot hoavdda duohkai.
they kicked everything boss to.behind
 ‘They left it up to the boss to decide everything’

Syntactic evidence can be brought to bear as well, for example postpositions cannot be modified by adjectives, in contrast with nouns.

- (25) Dat ruohtai viesu (*sevdjnes) duohkai.
it ran house dark to.behind
 ‘It ran to (*dark) behind the house’ (Northern Sámi, thanks to Marit Julien)

The grammaticization from noun to adposition is a common one, and is the source of some adpositional elements in English, including *instead of*, from an old noun *stead* meaning ‘place.’ A perfectly parallel example can be observed in Northern Sámi as well, as *sadji* ‘place,’ used literally as a noun in (23c), has come to mean ‘instead’ when used as a postposition, as illustrated in (26).

The example also provides a minimal pair, since an adjective disambiguates the postpositional from the nominal meaning.

- (26) a. Son lea mannan mu sajis.
 3SG is gone me place.LOC/at.place
 ‘S/he has visited my place’ or ‘She has gone instead of me’
 b. Son lea mannan mu buori sajis.
 3SG is gone me good place.LOC
 ‘S/he has visited my good place’ (Northern Sámi, thanks to Marit Julien)

Thus, on the basis of general conventionalized use, distinct semantic meanings, divergent syntactic properties, and special morphological forms, we can distinguish a class of Northern Sámi adpositions which are distinct from nouns, even though the nominal local case marking system remains relatively transparent on many of these postpositions (in addition, nominal possessive marking remains compatible with some adpositions, as see in example (24a)).

2.3 Cross-linguistic generalizations

Thus, we find that many unrelated languages have a set of words for spatial relations with syntactic properties distinct from those of nouns or verbs, which we can identify roughly as belonging to a category P. Some typical properties of these adpositions are listed in (27), and discussed in turn.

- (27) Typical characteristics of adpositions
- a. Express binary relations between entities (including events)
 - b. Form a syntactic constituent with a DP complement
 - c. C-select properties of the complement
 - d. S-select properties of the complement
 - e. Project XPs which function as predicate or sentential adjuncts
 - f. Do not combine with tense or aspect morphology

Quality (27a) can be observed in the examples given in §2.1 of adpositions from Lakota, Persian, ’O’odham, and Chinese, many of which are fundamentally spatial. Non-spatial examples can often be seen as metaphorical extensions of spatial meanings, for example *in my opinion*, *in time*, *in mind*, and so on (cf. §4 below). Other non-spatial adpositions express causal or topical relations, for example *regarding*, *despite*, and so on, in which the complement is often a reason, topic, or other cognitively prominent factor for which P expresses a relation to the event.

There is a significant class of uses of P which do not clearly express a meaningful relation; primary among these in English is *of*, which is often taken to be a case-marker, but which can be stranded unlike case markers in other languages (*Who did you take pictures of?*). I return to these grammatical prepositions, including certain uses of *by*, *for*, *to*, and *with* in §4.

Quality (27b) is independent of (27a), since even grammatical uses of P form constituents with their DP complements; this can be seen using language-specific displacement tests. For example, in 'O'odham, the auxiliary must appear in second position, so the fact that a DP-P sequence can appear before it is evidence that DP and P form a constituent (as seen in (28b), the determiner *g* is omitted when the PP is topicalized).

- (28) a. Kegcid 'o g nalaş **g 'ali we:hejeđ** g Husi.
clean AUX the orange the child for the Joe
 'Joe is cleaning the orange for the child'
- b. **'Ali we:hejeđ** 'o kegcid g nalaş g Husi.
child for AUX clean the orange the Joe
 'Joe is cleaning the orange for the child' ('O'odham; Zepeda 1983)

Similarly, locative inversion in English shows that the sequence *up the hill* in (29a) is a constituent; in contrast, the sequence *up the bill* in (29c) fails to participate in locative inversion, and generally does not pass diagnostics of constituency.

- (29) a. Christina ran up the hill.
 b. Up the hill ran Christina.
 c. May ran up the bill.
 d. *Up the bill ran May.

C-selection is the determination of syntactic conditions on a dependent. C-selection can be argued to hold only between a head and its complement, not a head and its specifiers or adjuncts (Svenonius 1994). For example, a verb may determine idiosyncratic case on its internal arguments, but not its external arguments.⁶ Similarly, a verb may determine that its internal arguments appear with a particular preposition, or that its clausal complements are finite or non-finite, but an individual verb can never make such demands on its external arguments or adjuncts. So it is with adpositions. Adpositions quite commonly determine the case of a complement, for example in the Russian and Icelandic examples in (30). There seems to be a certain degree of arbitrariness here; for example, 'out of' patterns with 'without' in Russian, but with 'towards' in Icelandic.

⁶This requires a few qualifications. Icelandic is famous for its quirky subjects, but quirky subjects are virtually always experiencers, cf. Jónsson (2003), or internal arguments promoted to subject position, cf. Sigurðsson (1989); I assume that dative experiencers are dative-marked systematically, rather than by lexical stipulation. Similarly, many languages have ergative case-marking on external arguments, but this is not determined verb-by-verb but for external arguments as a class, thus is not a matter of c-selection by individual verbs.

(30)	RUSSIAN		ICELANDIC	
	<i>k</i> ‘towards’	DAT	<i>mót</i> ‘towards’	DAT
	<i>iz</i> ‘out of’	GEN	<i>úr</i> ‘out of’	DAT
	<i>pod</i> ‘under’	INSTR/ACC	<i>undir</i> ‘under’	DAT/ACC
	<i>meždu</i> ‘between’	INSTR	<i>milli</i> ‘between’	GEN
	<i>bez</i> ‘without’	GEN	<i>án</i> ‘without’	GEN

Adpositions can also determine the category of a complement, following Emonds (1985), for example *during* takes a DP, but not a TP, whereas *while* takes a TP (or perhaps CP), but not a DP.

- (31)
- a. during the play
 - b. *during you slept
 - c. *while the play
 - d. while you slept

The selection by some English prepositions of *of* may be unified with one or the other of the two previous examples; either *in* takes objective case while *out* takes the so-called *of*-genitive, so that (32) illustrates c-selection for case, or else *in* selects a DP while *out* selects a PP, so that (32) illustrates c-selection for category.

- (32)
- a. in the house
 - b. *in of the house
 - c. *out the house
 - d. out of the house

In sum, P typically c-selects its complement, but this can only be demonstrated using language-specific diagnostics of c-selection.

Quality (27d) is the s-selection by P for its complement. S-selection is semantic selection, and is usually understood to hold of all the arguments of a head, not just its complements; for example, a verb may not determine the category of its subject, and so cannot c-select it, but can determine that the subject be animate, by s-selection. In this context I am interested in the s-selection by P for its complement, in that P may place semantic restrictions on its complement, typically in the form of presuppositions. For example, *in* presupposes that its complement is a container, and is infelicitous when the complement is not container-like, while *on* presupposes that its complement is a surface. These are presuppositions, and as such are preserved under negation (*#The cat sat in the mat* is odd in the same way as *#The cat didn't sit in the mat*). Similarly, *among* takes a complement which is complex, *between* requires a complement which consists of two parts, *inside* requires a complement which has ‘sides,’ and so on (see Svenonius 2004).

Patterns may be discerned cross-linguistically regarding what sorts of qualities of the complement are s-selected by an adposition. For example, many languages have adpositions which refer to the composition of their complements, such as water, earth, or human versus non-human, as in the Zina Kotoko words

for ‘near’ (see (4)) or in the ‘O’odham example here, where *ba:šo* can only be used with non-humans, and *ba’ic* can only be used with humans.

- (33) a. ’am ki: ba:šo
 there house in.front
 ‘in front of the house’
 b. ’am Mali:ya ba’ic
 there Maria in.front
 ‘in front of Maria’ (‘O’odham; Zepeda 1983)

Quality (27e) is the property of projecting an XP constituent (i.e. a PP) which functions as a predicate adjunct. In fact, it is cross-linguistically typical of PPs that they form adjuncts (as well as complements) to projections of both verbs and nouns (cf. van Riemsdijk 1998). In this they contrast with DPs and VPs for example, which do not so freely form adjuncts.

Finally, we turn to quality (27f), namely the quality that adpositions do not combine with tense or aspect morphology. This might be universal, but on the other hand it might simply be definitional; if an element combines with tense or aspect morphology, we call it a verb. This has been illustrated above with Chinese. Still, I believe it to be a significant generalization, and return to it in §5.

3 Figure and Ground

3.1 Adposition and Ground

I discussed in §2.2 the fact that P often forms a constituent with a DP, whose properties it controls by c-selection and s-selection in a way reminiscent of verbs and their complements. I did not, however, discuss the thematic character of the complement, which turns out to be strikingly limited.

Most, and probably all, spatial adpositions can be characterized as asymmetric relations between a Figure and Ground, following Talmy (1978, 2000). The Figure is the entity, object, or substance which is located or in motion, and the Ground is the location, object, or substance with respect to which the Figure is located or in motion.

- (34) Talmy (2000):312
 “The Figure is a moving or conceptually movable entity whose path, site, or orientation is conceived as a variable, the particular value of which is the relevant issue.
 The Ground is a reference entity, one that has a stationary setting relative to a reference frame, with respect to which the Figure’s path, site, or orientation is characterized.”

In the following examples, the complement of the preposition is always the Ground, while the figure is expressed by the direct object of the verb.

- (35) a. Max stuck his finger in his nose.
 b. We couldn't fish the frog out of the punch.
 c. The kids put decorations on the tree.
 d. The monkey pulled burrs from the sheep's fleece.
 e. The sheep chased the cat up a tree.
 f. We dropped the body down the well.

This pattern is not accidental; it is strikingly robust cross-linguistically. There are no reverse Ground-Figure adpositions. For example, there are no prepositions which would make it possible to describe the situations referred to in (35) with the Ground as the object of the verb, and the Figure as the complement of the preposition, as illustrated in (36) (all of these sentences are grammatical, but cannot be used to describe the corresponding situations in (35)).

- (36) a. #Max stuck his nose around his finger.
 b. #We couldn't fish the punch without the frog.
 c. #The kids put the tree in decorations.
 d. #The monkey pulled the sheep's fleece from burrs.
 e. #The sheep chased a tree under the cat.
 f. #We dropped the well above a body.

Of course, there are situations which can be described with either of two entities cast in each of the roles, for example when both entities can equally easily be seen as providing a location for the other.

- (37) a. The bridge is above the river.
 b. The river is below the bridge.

But there is a clear difference in the way the situation is framed in these two examples. Changing the example so that the arguments are more asymmetric in our model of the world nearly forces the asymmetry to be reflected linguistically (see Talmy 2000 for extensive discussion).

- (38) a. The mosquito is above your left ear.
 b. #Your left ear is below the mosquito.

I propose, therefore, the following condition on complements of P.

- (39) P never introduces a Figure complement

The cognitive grammar literature regularly notices the Figure-Ground asymmetry for adpositions, at least implicitly, but tends to treat it as a tendency (see for example the papers in Zelinsky-Wibbelt 1993), as does the cognitive science literature (e.g. Landau and Jackendoff 1993:224 call the Figure-Ground orientation "the canonical form" for prepositional constructions). There are certainly cases in which an object in motion is referred to by a prepositional complement, for example in the famous spray-load alternations.⁷

⁷Talmy (2000):333ff observes that the complement of P is usually a Ground, but takes this

- (40) a. We sprayed tomato juice on the dog.
 b. We sprayed the dog with tomato juice.
 c. We loaded seal meat onto the sled.
 d. We loaded the sled with seal meat.

Certainly, in (40a), *tomato juice* is the Figure and *the dog* is the Ground, by (34). Since (40b) can be used to describe the same scene, it would appear that *with* there introduces a Figure, contradicting (39). However, it is clear that *with* is either extremely polysemous or extremely vague, being able to introduce a number of different kinds of adjuncts, including instruments, manners, accompaniment, or accoutrements.

- (41) a. We sprayed the dog with a fire extinguisher.
 b. We sprayed the dog with glee.
 c. We sprayed the dog with an audience of boy scouts.
 d. We sprayed the dog with raincoats to protect us from spatter.

It is not clear whether the DPs introduced by *with* here could be characterized as Grounds, but it is clear that they cannot be characterized as Figures. Analogous comments apply to (40d). In contrast, *on* in (40a) (and *onto* in (40c)) introduce a Ground specifically. This is true even in locative and temporal cases like those in (42a) and (42b), and arguably even in abstract cases like that in (42c).

- (42) a. We sprayed tomato juice on the lawn.
 b. We sprayed tomato juice on Labor Day.
 c. We sprayed tomato juice on the grounds that it would make the dog smell good.

This is true regardless of the verb; but notice that the possibility of interpreting the complement of *with* as being in motion in (40b) and (40d) is very much dependent on the verb; that reading does not arise with different kinds of verbs.

- (43) a. We left the dog with tomato juice.
 b. We pampered the dog with tomato juice.
 c. We advertised the dog with tomato juice.
 d. We fattened the dog with tomato juice.

Thus, it seems safe to conclude that the apparent Figure reading of the complement of *with* is not introduced by the preposition *with* as part of its semantic

not to be absolute, arguing that certain cases of *with* and *of* to introduce Figures, contra (39), such as the following examples.

- (i) a. The room slowly filled with smoke.
 b. I drained the fuel tank of gasoline.
 c. The garden swarmed with bees.

I believe that my arguments that *with* does not introduce a Figure apply equally well to *of*; in any case *of* may be a case marker, rather than a preposition, in which case it would be irrelevant to generalizations about adpositions.

contribution, but comes in some sense from the construction as a whole.⁸

If P can be thought of as assigning a thematic role to its complement, it seems safe to conclude that that role is never that of Figure, hence (39) seems to be true. It is not clear that the various complements of adpositions like *with* can uniformly be fit into the general Figure–Ground dichotomy (for more discussion see §4), but at least if attention is restricted to spatial P, then it seems that (44) can be maintained.

(44) The complement of (spatial) P is a Ground

I return to the question of why (39) and (44) might hold in §5.

3.2 Particles

Having established a strong correlation between the syntactic complement of P and an interpretation as a Ground, in this section I discuss the other argument of P, namely the Figure. I focus on particles, since they frequently introduce Figures, but hasten to point out that the correlation between Figure (according to Talmy’s definition) and Particle (according to Emonds’ definition) is not one-to-one. Adpositions introduce Figures as well, most clearly in constructions like *sneeze the napkin off the table*, where *off* is a preposition. Furthermore, particles may introduce Grounds, as I discussed in Svenonius (2003) (i.e. there are ‘unaccusative’ particles, in expressions like *fill the hole in*). However, in the simplest case, the single overt DP argument of an adposition is a Ground, and the single overt DP argument of a particle is a Figure.

Particles share with adpositions all the characteristics which do not specifically refer to complements, namely they typically express spatial relations (27a), they project PPs which adjoin to various categories (27e), and they do not combine with tense or aspect morphology (27f). Other similarities (and differences) are discussed in §§3.2.1–3.2.2.

⁸An alternative approach would be to take *with* to introduce a Figure as an internal specifier; Harley (1995) discusses the similarity of *with* to the verb *have*. If *have* is derived from underlying BE plus TO, as in (ii), then perhaps *with* is, as well (see also Amritavalli 2002 on the construction *there is a lid to this pot*).

- (i) a. There is a lid to the pot.
b. We fit a lid to the pot.
c. BE [a lid [TO the pot]]
- (ii) a. The pot has a lid.
b. We fit the pot with a lid.
c. the pot TO-BE [a lid [_{TO} *t_{the pot}*]]

This is consistent with the fact that *with* can appear with small clauses more generally (*With Max dead, the cops will be looking for us*), and might explain a couple of things, for example the apparent Figure–Ground reversal in *a pot with a lid*—cf. *a pot with a lid to it*.

3.2.1 Particle and category

Particles, like English *up*, *down*, *off*, *out*, *away*, and so on, are different from adpositions in that they do not appear with complements, and are often called adverbs in traditional grammars. Emonds (1985) argued that English particles are members of the category P, using the distributional tests that I reviewed in §2.2. For example, particles may be complements to verbs like *dart*, may appear in constructions like the ‘PP *with* DP’ construction, and may be modified by *right*.

- (45) a. The cat darted out.
 b. Off with his head!
 c. They came right down.

Following Emonds, then, English particles are simply intransitive prepositions, drawing an analogy to the argument structure of verbs. Since c-selection allows individual verbs to specify whether they appear with an optional DP complement, an obligatory DP complement, a PP complement, a CP complement, or no complement at all, then P may in principle do the same. Those Ps which have no complement are called particles; a P can be a particle always, in never allowing a complement (like *upstairs*), or it can be a particle in a particular context, by having no complement in that context (like *up*), or it can be obligatorily transitive and never a particle (like *at*).

Many of the world’s languages have words that translate into English particles.

- (46) a. Phúcè vī **thē** lō né hi.
child throw up stone at house
 ‘The child threw stones up at the house’ (Eastern Kayah Li; Solnit 1997:168)
 b. Péter nem olvastz ókel **fel**.
Peter not read them up
 ‘Peter didn’t read them out’ (Hungarian; É. Kiss 2002:57)
 c. P’anšá kiŋ **hékta-wap’a-taŋhaŋ** ékigle yo.
suitcase the to-nearby-back put IMPERATIVE
 ‘Put your suitcase in the back’ (Lakota; Buechel 1939:194)

It is not always clear that these elements belong to the same category as the adpositions of the individual language in question, but in some cases, they clearly do. In Scots Gaelic and Malay, for example, the same elements which appear as prepositions can also sometimes occur without complements in constructions very similar to the English verb-particle construction (see also Ramchand and Svenonius 2002 for Scots Gaelic).

- (47) a. Chuir mi an coire air a’bhord.
put I the kettle on the table
 ‘I put the kettle on the table’

- b. Chuir mi an coire air.
put I the kettle on
 ‘I put the kettle on’ (Scottish Gaelic, thanks to Gillian Ramchand)
- (48) a. Ahmad membawa lampu itu ke bawah tangga.
Ahmad brought lamp the to down stairs
 ‘Ahmad brought the lamp downstairs’
- b. Ahmad membawa lampu itu ke bawah.
Ahmad brought lamp the to down
 ‘Ahmad brought the lamp down’ (Malay; (48a) thanks to Fahiza bt Basir, (48b) from Salleh 1992)

Frequently, particles and prepositions are distinct; for example where English has simply *in*, Norwegian has *inn* as a particle and *i* as a preposition (cf. German *ein* and *in* respectively). In the extreme, one might find fully distinct classes of particles and adpositions, though they might still both be subtypes of category P. If a language had no cases of ambiguously transitive or intransitive verbs, we could still identify a category of verb including both the intransitive and transitive members.

Chinese may be closer to the extreme case, as its prepositions almost invariably require overt complements, while there are other elements which might be identified with particles (e.g. *jìn* ‘in’ and *chū* ‘out,’ often combined with direction indicators *lái* and *qù*; see e.g. Po-Ching and Rimmington 2004:131ff.). One property that Chinese particles share with prepositions is the possibility of incorporation. Compare (49b) below with (17b) in §2.2.2 above.

- (49) a. Fúwùyuán tí le yī zhī xiāngzi **jìn-lai**.
attendant bring PERF one CLASS trunk into-come
 ‘The attendant brought a trunk in’
- b. Fúwùyuán tí **jìn-lai** le yī zhī xiāngzi.
attendant bring into-come PERF one CLASS trunk
 ‘The attendant brought in a trunk’ (Chinese; Po-Ching and Rimmington 2004)

A few of these particles are identical to postpositions (at least *shàng* ‘up’ and *xià* ‘down’). A fuller investigation of Chinese particles and their relationship to the category P is unfortunately beyond the scope of the present study; note, however, that deictic elements similar to Chinese *lái* ‘toward speaker’ and *qù* ‘away from speaker’ are very commonly integrated into adpositional systems cross-linguistically.

3.2.2 Particles and Figure

The postverbal DP in the examples in §3.2.1 was not the Ground but the Figure of the spatial relation picked out by the particle. This is not necessarily always the case, but it is typical. In this section I point out how the criteria discussed in §2 which picked out the Ground as the unique complement of P distinguish the Figure as not complement-like. These are for the most part constituency

and c-selection; P does not form a tight constituent with the Figure, and it does not c-select the Figure, as I suggested in §3.1.

3.2.2.1 *Constituency and the Figure.* P may of course form a constituent with its Figure argument, as any predicate might, as illustrated in the series of small clauses in (50).

- (50) jo un da jing dat kladderdaatsch,
well and then went that crash.bang
 Heck **op**, Klaus **eren**, Heck **zo**, Auto **fott**
hedge open Klaus inside hedge closed car away
 ‘Well and then it went crash-bang: hedge open, Klaus inside, hedge closed, car gone.’ (Cologne dialect of German; Bhatt and Lindlar 1998)

However, such constituents do not match the tight bond formed between P and its Ground complement. This can be seen, for example, in the relative freedom of placement of a Figure with respect to P. Most languages can be said to prohibit adposition stranding, or to allow it only under very narrow circumstances, but this does not apply to Figure arguments.

For example, many languages are like Chinese in allowing the Figure to alternate in order with a particle, as illustrated here (compare the word order here with (47b) and (48b) in the previous subsection).

- (51) Chuir mi **air** an coire.
put I on the kettle
 ‘I put on the kettle’ (Scottish Gaelic; thanks to Gillian Ramchand)
- (52) Ahmad membawa **ke bawah** lampu itu
Ahmad brought to down lamp the
 ‘Ahmad brought down the lamp’ (Malay; Salleh 1992)

Reorderings of P and Ground are not unknown, for example ’O’odham allows it (Zepeda 1983), and Finnish has a few adpositions which allow either order, as in (53a), but far more common are rigid pre- and post-positions, as in (54a).

- (53) a. **päin** seinää
into wall
 ‘into the wall’
 b. seinää **päin**
wall into
 ‘into the wall’ (Finnish; Manninen 2003)
- (54) a. **edessä** taloa
in.front.of house
 ‘in front of the house’
 b. *taloa **edessä**
house in.front.of
 (Finnish; Manninen 2003)

The rigid ordering which is typical of P and its Ground argument is generally absent for P and its Figure argument; the particle shift pattern seen in (51)–(52) is fairly typical, though there is great variation (e.g. Icelandic and Norwegian are like English while Danish allows only the Figure–Particle order and Swedish only the Particle–Figure order; Taraldsen 1983; Svenonius 1996a,b).

3.2.2.2 *C-selection and the Figure.* Recall from §3.1 that P exerts c-selectional restrictions on its Ground. The same P does not also exert c-selectional influence on its Figure. For example, though the case of a Ground DP complement is quite commonly determined by the selecting P, the case of the Figure arguably never is. Take, for example, Icelandic. In Icelandic, verbs commonly c-select for dative or accusative complements.

- (55) a. Við erum að bera blöð.
we are at carry newspapers.ACC
 ‘We are carrying newspapers’
 b. Hann fylgdi mér á stoppistöðina.
he followed me.DAT to the.bus.stop
 ‘He accompanied me to the bus stop’ (Icelandic)

The case determined by the verb tends to be preserved in verb-particle constructions, in the great majority of examples, irrespective of particle shift.⁹

- (56) a. Við erum að bera blöð **út**.
we are at carry newspapers.ACC out
 ‘We are delivering newspapers’
 b. Við erum að bera **út** blöð.
we are at carry out newspapers.ACC
 ‘We are delivering newspapers’ (Icelandic)
- (57) a. Hann fylgdi málinu **fram**.
he followed the.goal.DAT forth
 ‘He pursued the goal’
 b. Hann fylgdi **fram** málinu.
he followed forth the.goal.DAT
 ‘He pursued the goal’ (Icelandic; Ramchand and Svenonius 2002)

Case assignment in Icelandic is sensitive to Aktionsart (Svenonius 2002); since particles can change the Aktionsart of the verb phrase they appear in, it is to be expected that there are examples in Icelandic where the verb and particle together assign a different case than the verb by itself.

- (58) a. Ég lokaði dyrunum.
I shut the.doors.DAT
 ‘I shut the door’

⁹To the extent that *út* and *fram* are used as prepositions, it is with the accusative: *út dalinn*, ‘down the valley’; *fram dalinn* ‘up the valley,’ though far more common are PP complements, *fram á nes* ‘out onto [the] point,’ *út um gluggann* ‘out of the window.’

- b. Ég lokaði hundinn inni.
I shut the.dog.ACC inside
 ‘I shut the dog inside’ (Icelandic)

However, the particle never determines the case of the Figure all by itself, the way a preposition may idiosyncratically determine a particular case on its DP Ground complement.¹⁰

The lack of c-selectional influence by the particle on the Figure can also be illustrated in English, in terms of category. Recall from §2.2 (in particular example (31) there) that P may determine whether its complement is DP, PP, CP, or whether there is no complement at all. In contrast, no P can exert such influence over its Figure. As Figures are subjectlike, they are usually DP, but they may be CP, as illustrated in (59).

- (59) a. We figured out that the answer was five.
 b. We shouted out that the answer was four.

These are clearly particle verbs with a metaphorically extended Figure-Ground semantics (*We figured the answer out* means ‘we figured, such that the answer became “out,” i.e. known’). However, there are no particle verbs which *require* a CP Figure, nor are there particle verbs that forbid them, except insofar as their meanings are incompatible with the propositional content expressed by a CP.

3.2.2.3 S-selection and the Figure. As I mentioned in §2.2, though a verb cannot c-select properties of its subject, it may place s-selectional restrictions on the subject. This can be seen by comparing, for example, the senses of *run* which are possible with animate and inanimate subjects.

- (60) a. George ran. (= ‘moved quickly on legs’)
 b. The refrigerator ran. (= ‘functioned, as an appliance’)

The word *run* cannot be used to express that an animate being is functioning normally, nor to express that an appliance moves quickly on its little metal legs (not even, for example, if it bounced out of the back of a moving truck). Of course, if we refer to a person as if he or she were inanimate, then the ‘functioning’ meaning becomes available, and if we tell a story in which a machine is animate, then the ‘move quickly’ meaning is possible.

- (61) a. George’s body seems to be running smoothly, but his mind keeps malfunctioning.
 b. With a wave of his wand, the wizard soon had the refrigerator running around the kitchen, playing a pick-up game of touch football

¹⁰Maling (2001) notes a number of dative-taking particle verbs in Icelandic with the particle *saman* ‘together.’ This bears investigating as it looks like a counterexample to my claim that a particle cannot c-select a particular case on a Figure argument. I will assume, in the meantime, that the dative there is the result of *saman* having a systematic effect on the Aktionsart of the verb phrases it enters.

with the other appliances.

So the two different senses of ‘run’ are closely restricted to animate and inanimate subjects. Particles make the same kinds of distinctions among their Figures.

- (62) a. Jacob is away. (=‘out of town’)
b. Monica is over. (=‘visiting’)

These meanings are not possible with inanimate subjects, except insofar as inanimates can be anthropomorphized or otherwise understood as animate. For example, if a book has been lent through interlibrary loan, it is not natural to describe the situation by saying at the lending library that the book is *away*, nor at the borrowing library that the book is *over*. Full PPs using these Ps are possible; a book can be *away from Tromsø at the moment* or *over here*, in which case the idiomatic meaning of the particle is not invoked.

In general, it seems that the degree of influence that P has over its Figure, when expressed as a DP, is very similar to the degree of influence that V has over its external argument.

4 Non-spatial P

I have concentrated so far on spatial P, though non-spatial examples have come up at several points. A few remarks specifically about non-spatial P are in order.

4.1 Metaphorical extensions of spatial P

Some languages have a great assortment of non-spatial adpositions. Many of them can be understood as straightforward metaphorical extensions of spatial P, so that the Figure-Ground dichotomy can be applied, but sometimes it becomes more difficult to see that the Figure-Ground labels apply.

Talmy (2000) argues at length that clause-taking P in English (what traditional grammars call ‘subordinating conjunctions’; cf. Huddleston and Pullum 2002 for discussion) like *because*, *despite*, *while*, and so on take Ground complements, essentially as sketched in (63) (cf. Talmy 2000, esp. vol. I ch. 6).

- (63) a. [_{FIGURE} I took care] in [_{GROUND} drying the cups].
b. [_{FIGURE} She went home] after [_{GROUND} stopping at the store].
c. [_{FIGURE} They stayed home] because [_{GROUND} they were feeling tired].

To take another example, there are a number of P elements which seem to introduce experiencers, including in English benefactive *for*, malefactive *on*, and a perceptual experiential *to*.

- (64) a. She lied for him.
b. My car broke down on me.
c. To most people, this is just an ordinary cookie.

It is possible to imagine that the experiencer in these cases is a Ground in some extended sense of the term; to put it in Talmy’s terms (cf. (34) in §3.1) would require, for example, for the event of lying in (64a) to be a “conceptually movable entity” which is “oriented” relative to the complement of the preposition. The danger in such an approach is that it becomes difficult to maintain the strong predictive character of Figure–Ground generalizations like the ones made in §3.1. The alternative is to say that these involve P assigning a distinct thematic role, that of Experiencer, to its complement.

Various other extensions of spatial relations have been pursued at length in the cognitive grammar literature. There is no space here to detail those discussions, far less to attempt to resolve the issue, though obviously the temptation is to strengthen the generalizations made in §3.1 to something like (65).

- (65) a. The internal argument of P is a Ground
 b. The external argument of P is a Figure

Leaving this as an hypothesis, rather than a conclusion, I turn to a brief discussion of so-called grammatical P.

4.2 Grammatical P

In §3.1, I briefly discussed spray-load *with* and argued that rather than introducing a Figure argument, it introduced an adjunct whose interpretation came from the verb phrase as a whole. In this it can be compared to passive *by*; whether the complement of *by* is interpreted as an agent, a causer, an instrument, an experiencer, or a location is dependent on the verb, suggesting that the preposition does not actually assign these thematic roles.

- (66) a. Lila was investigated by the CIA.
 b. The window was broken by the storm.
 c. This bread can’t be cut by an ordinary knife.
 d. This movie is liked by Tolkien fans.
 e. The house is surrounded by trees.

One way to deal with adpositions of this type is to suppose that the DP in question is not originally a complement of the adposition, but is an argument of the verb, with the adposition being introduced later (cf. Kayne 2004; Cinque 2002 and Collins 2004, where certain Ps are introduced outside VP; or Pesetsky and Torrego 2004, in which certain Ps are introduced inside DP).

These might be characterized as case-assigning or functional prepositions. The clearest case might be the complementizer and preposition *for*, which is standardly assumed (since Rosenbaum 1968 and Bresnan 1970) not to take the DP following it as a complement, in constructions like the following.

- (67) a. They hoped for the French cyclist to win.
 b. They demanded for Kjell Magne to be examined by a specialist.
 c. They arranged for there to be more sensational pictures.

The diagnostics applied in Emonds (1985) to identify the category P do not generally help in identifying such grammatical prepositions as members of the same category as the more contentful spatial prepositions. It hardly makes sense to ask if a grammatical preposition can head the complement of *dart* or appear in the ‘PP *with* DP’ construction. As for modification by words like *right*, this generally fails when PP is of the ‘grammatical’ sort discussed here.

- (68) a. We filled the bucket (*right) with fish.
 b. Polly was investigated (*right) by the CIA.
 c. They hoped (*right) for the French cyclist to win.

The separation of P into functional and lexical types has been proposed many times (for example Bresnan (1982); van Riemsdijk (1990); Starke (1993); Yadroff (1999); van Eynde (2004)). However, even the most lexical members are somehow ‘less lexical’ than clear lexical categories like V and N. A likely scenario is that rather fine distinctions will ultimately have to be made among different subsorts of P, with some being more lexically contentful than others. At the extreme end of the scale, truly contentless adpositions may cease to be adpositions at all, and become case markers.

4.3 Case markers

The English preposition *of* is often characterized as a case-marker, rather than a true preposition, for example when it marks the complements of nominalized verb. In many languages, for example Hindi and Japanese, it can be especially difficult to distinguish case markers from adpositions. Here I take a specific example, that of Spanish, in which it can be argued that what was historically an adposition has developed into a case marker.

- (69) a. Ella levantó a un niño.
she lifted to a child
 ‘She lifted a child’
 b. El soldado emborrachó a varios colegas.
the soldier made.drunk to several friends
 ‘The soldier got several friends drunk’ (Spanish; Torrego 1998)

If *a* in (69) is a preposition, as glossed here, then the complement of P is not always a Ground—in fact, in (69a) the DP following *a* is clearly a Figure. However, although there are complex conditions on the distribution of *a* (see Torrego 1998), it does not seem to contribute thematic information to the object it appears with, that being determined entirely by the verb. Furthermore, it displays some behavior that is more consistent with the cross-linguistic behavior of case markers than of adpositions, for example there are contexts where a direct object cannot bear the overt marker *a* in the presence of a selected dative argument, as in (70b) (the dative preposition *a* in (70b) is fused with the definite article, written *al* in Spanish orthography).

- (70) a. Describe a un maestro de Zen!
describe to a master of Zen
 ‘Describe a Zen master!’
- b. Describieron (*a) un maestro de Zen al papa.
described to a master of Zen to.the Pope
 ‘They described a Zen master to the Pope’ (Spanish; Torrego 1998)

Another piece of evidence that *a* preceding a direct object is not a true preposition is that such a direct object may control a depictive, in contrast to complements of P.

- (71) a. Juan la encontró a ella (borracha).
Juan 3SG.ACC met to her drunk.FEM
 ‘Juan met her_i (drunk_i)’
- b. Juan le habló a ella (*borracha).
Juan 3SG.DAT spoke to her drunk.FEM
 ‘Juan spoke to her_i (*drunk_i)’ (Spanish; Bresnan 1982)

Similar remarks apply to the Semitic accusative marker (e.g. Hebrew *et-*, see Khan 1984). I return to the effect of adpositions on verbal complements in §5. In the meantime I assume that the Figure-Ground generalizations hold for grammatical P at least in a weak form: No P introduces a Figure as its complement ((39) in §3.1); but given that there is so little thematic content to the relation between P and its complement, it may be impossible to clearly demonstrate the strong hypothesis for such Ps given in (65) in §4.1 (the internal argument of P is a Ground, the external argument of P is a Figure).

Furthermore, I assume that case markers are not P, so that for them the Figure-Ground generalizations do not hold at all: a Figure may be case marked, so if, for example, Spanish *a* or Hebrew *et-* is a case marker, there is no reason to expect it to be absent from Figure arguments.

5 Adpositions and verbs

In this section I discuss the argument structure of V, which, though far more complex, is actually better understood than that of P. I suggest that one of the basic conclusions about the syntax of the verb phrase should be extended to the prepositional phrase, namely the split-V hypothesis. I suggested this on the basis of purely Germanic-internal considerations in Svenonius (2003), but here the arguments are broadened and refined.

5.1 Split-V and Split-P

Thematic hierarchies such as those of Jackendoff (1972) and related work are designed primarily to capture certain overwhelming tendencies in argument structure. Thematic information such as which argument is a causer or an undergoer of a process determines which argument is projected as the subject and which

is projected as the direct object. The hierarchies were developed on the basis of the fact that just about any argument may surface as the subject as long as there is nothing higher, something which suggests that every theta-role has a position only relative to other theta-roles in the same predicate; but surface syntax tends to conceal a basic split between external and internal arguments (Williams 1994). Causers are never internal arguments, no matter what else happens, and external arguments are arguably never undergoers of processes (though this is less clear).

The basic and important split between external and internal arguments is captured in the split-V hypothesis (Hale and Keyser 1993; Kratzer 1994, 1996; Harley 1995), which suggests that the initiating or causing stage of an event is represented by a separate syntactic projection, the projection of a light verb head *v*. Causers, Agents, and other external arguments are then arguments of *v*, while undergoers of processes are arguments of V, the complement of *v*.

I suggest that the same considerations that led to the split-V compel us to adopt a split-P. The Figure-Ground asymmetry documented in §3.2 is quite robust, and neatly captured by assuming that the Ground, an argument of P, is within the syntactic sphere of influence of the adposition, just as the Theme or Patient argument is within the syntactic sphere of influence of the verb; while the Figure, and argument of *p*, is outside that sphere of influence—external to it—and moves into the higher syntactic domain for licensing, just as the Agent moves into the T domain for nominative case.¹¹

I used Pesetsky's (1982) term *s*-selection in §2.2 to refer to the selection for semantic characteristics of the Ground by P, and in §3.2.2 to refer to the selection for semantic characteristics of the Figure by the particle. In the former case, Grounds were specified as containers, surfaces, geometrically complex, water, the ground, human or non-human, and so on. In the latter case, Figures were specified as animate or inanimate. If *s*-selection holds of the Figure as well as of the Ground, then one might ask why there are not equally rich *s*-selectional restrictions on both, for example prepositions which require of their Figure rather than of their ground that they consist of two parts (the inverse of *between*; compare the verbs *straddle* and *sandwich*).

The usual pattern for the verbal complex is that there is a large number of members of category V, with rich encyclopedic content and detailed sets of entailments over the internal argument (it might be presupposed to be a stock for trade, for example, or a male reindeer, etc., and its entailments might involve complex financial arrangements or preparations for breeding), and a small number of members of category *v*, with very little encyclopedic content (e.g. simply the difference between Agent and Causer, or between animate and

¹¹The chief exception to this pattern (in the verbal domain) is the one seen in ergative constructions, in which the external argument appears to receive its ergative case relatively low, leaving the internal argument to seek nominative case higher up; it would be interesting to discover whether there are 'ergative' type adpositional constructions, but my impression is that there are not. Conceivably the Icelandic example with *saman* mentioned in note 10 could be treated along these lines, but such patterns seem quite rare, much rarer than ergative languages.

inanimate initiator). This is true both of those accounts which posit a *v* with no phonological manifestation for languages like English and for accounts in which some overt morphology is identified with *v*, for example Austronesian transitivity affixes (Travis 2000), transitivity suffixes in Ulwa and other North American languages (Hale and Keyser 2002), Persian light verbs (Megerdooomian 2002), Hebrew verb templates (Arad 1998; Doron 2003), Slavic theme vowels (Jabłońska 2004), and so on; in each case, the total inventory of *v* is relatively small while the inventory of heads which can function as the lexical complement of *v* is very large.

Similarly, most languages appear to have more P elements than *p* elements, as far as I can determine. Grammars often report of an adpositional element, for example, that it means ‘behind (a person)’ or ‘into (water),’ but very rarely that it means ‘behind (of a person)’ or ‘into (of a round object).’

However, this may not be the whole story. The use of P that I have focused on in discussing the properties of the Figure is the one seen with verbs of directed motion (*spray paint on the wall*) and with simple copular predications (*The paint is on the wall*). These are, however, not the most common uses of adpositional constructions cross-linguistically; in fact, some languages do not even allow them; for example, Baker (1996) points out that in Mohawk, a complement PP can only take a neuter agreement marker, suggesting that the Figure DP is not directly functioning as its subject.

- (72) a. Ka-nakt-óku wa-hi-ya't-áhset-e' ne Sak.
NSGS-bed-under FACT-1SGS.MSG O-body-hide-PUNCT NE Sak
 ‘I hid Sak under the bed’
- b. *Ra-nakt-óku wa-hi-ya't-áhset-e' ne Sak.
MSGS-bed-under FACT-1SGS.MSG O-body-hide-PUNCT NE Sak
 (Mohawk; Baker 1996:399, 402)

Rather, the most basic use of adpositional constructions appears to be as a VP or sentence modifier. In such cases, there is no DP Figure; rather, the event stands in as the external argument or ‘Figure’ of the relation. Recall from §2.2 that PP modifiers are different from VP adjuncts in that VPs require a prominent DP controller, while PPs do not, suggesting that PP adjuncts do not contain a PRO subject.

The question arises, then, how PP (taking this now to refer to the capital-P-plus-Ground constituent, excluding a Figure-introducing projection) is combined with the larger structures in which it finds itself. If *p* is essentially a kind of predicator (cf. Bowers 1993), then one possibility is that PP is connected to syntactic structure in general via different types of *p*. One *p*, not shared by Mohawk, introduces a DP Figure. Another *p* would allow PP to function as a noun phrase modifier; as far as I can tell, Chinese lacks this *p*. The most usual *p*, however, is one that allows PP to function as a VP modifier. The exact details will have to be left to future research.

5.2 Arguments of V

Some verbs have argument structures resembling that of P; compare the sentences here.

- (73) a. There is smoke in the lavvo.
b. Smoke filled the lavvo.
- (74) a. The pressure went out of the keg.
b. The pressure escaped the keg.
- (75) a. Mashed cans and broken bottles were all over the field.
b. Mashed cans and broken bottles covered the field.
- (76) a. The cat went up the tree.
b. The cat ascended the tree.
- (77) a. There was a tuft of pink hair on his head.
b. A tuft of pink hair crowned his head.
- (78) a. Madeleine went from the scene.
b. Madeleine left the scene.

However, there are also many verbs with argument structures which seem to be quite impossible for adpositions. Verbal internal arguments may be, for example, incremental themes of changes of state, whereby the theme is asserted to undergo a change of state over the run time of the event, as in (79); or they may be themes of directed motion, whereby a change of location is asserted of the theme, as in (80).

- (79) a. He melted the radio.
b. She painted the light switch.
c. They destroyed the evidence.
d. We built an igloo out of sand.
- (80) a. He threw the radio.
b. She dropped the light switch.
c. They brought the evidence.
d. We catapulted an igloo.

In short, the possibilities are simply richer for verbs than for adpositions. Many of the additional possibilities involve a notion of change in some property of the object, for example its location. Entailments of change are often eliminated when an adposition is added, for example in the conative construction.

- (81) a. The donkey ate the saddle. (\models saddle is gone)
b. The donkey ate at the saddle ($\not\models$ saddle is gone)
c. Svetoslav cut the rope (\models rope is severed)
d. Svetoslav cut at the rope ($\not\models$ rope is severed)

In other cases, the difference between an accusative and an oblique is that the accusative is the measure of the event, whereas the oblique is not (see Tenny 1994).

- (82) a. Katherine ran the marathon. (\models ran the extent of the marathon)
b. Katherine ran in the marathon ($\not\models$ ran the extent of the marathon)
c. Solomon painted the wall (\models whole wall is painted)
d. Solomon painted on the wall ($\not\models$ whole wall is painted)

This can also be seen in the spray-load alternation, where there is at least a tendency to interpret the direct object as fully affected, but not the prepositional complement (as has often been pointed out).

- (83) a. Max sprayed the paint on the wall. (all the paint)
b. Max sprayed the wall with paint. (the whole wall)

Much recent work has centered on the ways in which an event might formally map onto a direct object, or onto some salient property of the object (Krifka 1992, 1998; Ramchand 1997; Hay et al. 1999; Borer 2005; Kratzer 2004). The difference between direct internal arguments, especially direct objects (but also unaccusative subjects) and other arguments, including adpositional arguments, is usually stated in these accounts.

One way to generalize about verbs is to say that there is always a mapping from some property of the object to the run time of the event, though for certain verbs this mapping is trivial, as the eventualities they describe have no internal structure, as in the case of stative verbs like *see* and *know* but also for punctual verbs like *hit* and *jump* (as in *jump the fence*).

With directional adpositional complements, there is a mapping between the event and the path. Directionals can contribute telicity, as with *to*, or fail to, as with *towards*, just like quantized and non-quantized direct objects.

- (84) a. The messenger delivered messages (for an hour).
b. The messenger delivered eight messages (in an hour).
c. The messenger ran towards the city (for an hour).
d. The messenger ran to the city (in an hour).

This suggests that directionals are always mapped onto the event denoted by the verb, just as direct objects are. This means that PPs denoting paths have a part-whole structure similar to that of nouns and verbs, and participate in the mapping relation with verbs.

What seems to be absent is any way for the scalar properties associated with the Ground complement of the adposition to participate in the mapping with the verb. For example, when the donkey engages the saddle in an eating event (cf. (81a)), the parts of the saddle are mapped onto the parts of the eating. But when the saddle is embedded under the adposition *at*, as in (81b), the object can no longer be mapped onto the event.

This is partly captured by the connection to accusative case which is invoked in many of the previous accounts cited above. If each DP takes only one case,

then a DP which takes adpositional case will not also receive verbal accusative case; and if verbal accusative case is closely related to the mapping function, then adpositional complements will not map onto events.

Many languages show an accusative–oblique alternation with adpositional complements, with the accusative case being used just in case of a Path interpretation, that is, just in case there is a mapping. But even there, it is not the Ground which is mapped onto the event, but its Path.

5.3 Ground in motion

There are a few rare cases in which a complement of P is understood to be in motion, by virtue of the meaning of P itself, for example in the examples here, from Nikanne (2003).

- (85) a. Buick on Volvon edellä.
Buick is Volvo in.front.of.moving.Ground
 ‘The Buick is driving such that it stays in front of the Volvo’
- b. Buick on Volvon edessä.
Buick is Volvo in.front.of
 ‘The Buick is in front of the Volvo’ (Finnish; Nikanne 2003)
- (86) a. Buick on Volvon perässä.
Buick is Volvo behind.moving.Ground
 ‘The Buick is following behind the Volvo’
- b. Buick on Volvon takana.
Buick is Volvo behind
 ‘The Buick is behind the Volvo’ (Finnish; Nikanne 2003)

As Nikanne demonstrates, the postpositions in (85a) and (86a) are used only when the Ground is in motion, while the postpositions in (85b) and (86b) are neutral. At first, this would appear to make these postpositions more like verbs of directed motion of the type in (80). However, the implication of motion here is a presupposition, more like the s-selectional restrictions discussed in §3.1, where adpositions were shown to presuppose of their Grounds that they be water, or containers, and so on. In (85a) and (86a), motion is presupposed, not asserted, as can be seen when such examples are negated.

- (87) a. Buick ei ole Volvon edellä.
Buick NEG be Volvo in.front.of.moving.Ground
 ‘The Buick isn’t driving such that it stays in front of the Volvo’
- b. Buick ei ole Volvon perässä.
Buick NEG be Volvo behind.moving.Ground
 ‘The Buick isn’t following behind the Volvo’ (Finnish; thanks to Elina Halttunen)

Here, the implication of movement remains, even when the sentences are negated. This is not true of the examples in (80), where, for example *He didn’t throw the radio* does not imply that the radio moved. Thus, the generalization (39), that

the complement of P is never a Figure, can be upheld, as the Figure in these examples is still clearly the Buick.¹²

A real counterexample, then, would be an adposition, for example, that meant roughly what *moving* or *flowing* or *warming* means, but which was unlike those words in not being a verb, that is, in not combining with tense or aspect and in not requiring a PRO subject when appearing as an adjunct. For example, if there were a language in which this putative P could be used in sentences like *The lion rested amove its tail* to mean ‘The lion rested, its tail moving’; or *I sat in the park, beflow the leaves in the trees* to mean ‘I sat in the park, where the leaves in the trees were flowing’; or *It was sunny awarm her cheeks* to mean ‘It was sunny and her cheeks became warm.’

In the next section, I suggest why such adpositions do not exist.

5.4 Tense

In suggesting that P and V decompose in similar ways, so that the external argument of either is introduced by a separate, ‘light’ head, I have undone what Baker (2003) proposed as the most fundamental distinction between P and V, namely the distinctive property of the latter that it take a specifier (cf. also Hale and Keyser 1991, 2002, who proposed exactly the reverse, for languages like English).

Baker argues at length that V takes a specifier, citing EPP (obligatory ‘subject condition’) effects, and suggesting that these cannot be due to tense as they are manifested in small clauses. However, there are reasons to question these conclusions. First, EPP effects show up in small clause contexts even with non-verbal categories (e.g. in *We made *(it) obvious that we wanted to leave*), so the argument that V induces EPP there is not uncontroversial. Furthermore, there are good reasons to assume some functional structure in small clauses anyway (e.g. the predicate is a maximal projection, as noted by Williams 1983: *How obvious did you make it?*). Second, there appears to be substantial variation in the way EPP is manifested cross-linguistically, something which is expected if EPP is a property of a functional category, but not if it is a property of a lexical category (for example, EPP is satisfied by null elements like trace in English, but apparently not in Vata (Koopman 1984); Icelandic also shows evidence of a phonological EPP (Holmberg 2000); EPP appears to be absent in Irish (McCloskey 1996); EPP is arguably active in C in V2 languages like Dutch and German, but in T in languages like English, and in both in languages like Mainland Scandinavian (Roberts and Roussou 2002)).

I propose instead that what makes verbs unique is that they combine with Tense; somehow, they provide the sort of eventual variable that Tense needs to bind, and nothing else does. In general, this seems to be correct; tense and aspect morphology combines freely with verbs in most languages, and not with any other category. In fact, this is almost definitional in many grammars. In

¹²Marit Julien has pointed out to me that English and Norwegian make a distinction similar to the Finnish one in certain constructions; for example one can say *The Buick drove after the Volvo* only if the Volvo is in motion, in contrast to *behind*.

those cases where a clearly distinct category combines with Tense, for example the stative verbs of Mohawk discussed by Baker (2003), there are two possible solutions. One is that those words carry the right kind of event variable (making them by definition verbs, on the account suggested here), and the other is that they combine with a null V of some kind (making them derived verbs, perhaps deadjectival).

Baker, in arguing against specifiers in PP, points out that PP is not easily used as a predicate, in many languages, in contrast to VP; but on the assumptions proposed here, that follows if PP cannot be bound by Tense and therefore cannot be the complement to T.

Baker observes the correlation between verbs and tense, but attempts to derive it indirectly, through the language-specific stipulation stated in (88).

(88) “(In certain languages, certain) tenses must attach to a lexical category”
(Baker 2003:50)

The idea is that categories A and N, which cannot have specifiers, must combine with a predicative head in order to project subjects. This predicative head intervenes between T and the lexical head, preventing the two from combining directly, in violation of (88). The verb, which can project an external argument in a specifier, need not combine with a predicative head, and is therefore able to combine with Tense directly.

Baker assumes that P is a functional category, so that in order for it to combine with T, some lexical head (e.g. a verb) must be inserted.

I find (88) unsatisfactory. It makes the false prediction, for example, that A and N should easily combine with tense when they do not have subjects. Furthermore, (88) does not seem to follow from anything. If (88) were correct, then T morphemes should not attach outside, for example Aspect morphemes, but T attaching outside Aspect is quite common cross-linguistically (cf. Bybee 1985; Julien 2002).

Baker explicitly rejects the idea that verbs are distinct from other categories in bearing an event variable of the neo-Davidsonian type (cf. e.g. Parsons 1990), pointing out that neo-Davidsonian variables are often postulated for other categories, and are sometimes argued to be absent from certain verbs.

However, if we assume that the variables introduced by non-verbal heads are of a different sort from those introduced by verbs, then the fundamental connection between tense and the verb can be stated more directly than in (88). Adopting a sortal distinction among types, as in Chierchia and Turner (1988), different subtypes of variable can be distinguished. Assume, for example, that adpositions have variables of sort ‘s’ (for situation, as in Barwise and Perry 1983), and verbs have eventual variables of sort e. Assume furthermore that although s can be bound by certain operators, it cannot be bound by temporal or aspectual operators, as it is of the wrong sort; temporal operators exclusively bind variables of sort e. When PPs adjoin to projections of V, *p* designates a relation between the e of the verbal projection and the s of the PP; when PPs adjoin to projections of N, *p* serves to relate some variable in N to the s of the

PP.

The idea is that various syntactic differences between V and other categories can be traced to the variable *e*, which is eventive. Only something bearing *e* can have a run-time or express a change of state. There are two potential challenges. The first is verbs which are non-eventive, that is, stative verbs. These are not problematic, however, as there is substantial evidence that stative verbs bear *e* variables (see Ramchand forthcoming). The most satisfying situation would be one in which all such verbs are unified under one or two special stative verbal heads, for example each is actually a deadjectival predicate containing an abstract verbal head with little lexical content like BE (cf. Baker 2003).

- (89) a. Nina likes spinach.
b. Nina [_{VP} BE [_{AP} FOND.OF spinach]]

In any case, the existence of verbs which do not imply changes or transitions is not problematic for the claim that the kind of variable that allows the expression of change or transition is not a possible component of P.

More interesting is the case of Path-denoting PP. Paths are mapped onto events, in a way that demonstrates that they have some internal structure (as I mentioned in §5.2, Paths can be telic or atelic; see (84)). This is only manifested, however, in Paths which are complements of motion V; that is, it must be licensed by a verb (cf. Folli and Ramchand 2001, 2002; Tungseth 2003), in fact a particular kind of verb (hence the difference between *dance into the kitchen*, ‘move into the kitchen, dancing’ and *smile into the kitchen*, which cannot mean ‘move into the kitchen, smiling’; nor does *the bus to Manndalen* mean ‘the bus moving to Manndalen,’ but only ‘the bus whose route goes to Manndalen’).

This suggests that to the extent that a P projection can support an *e*-like variable at all, it must be linked to verbal structure, hence ultimately bound by tense.

It has often been noted that adpositions consist of two parts, a Path part and a Place part, arranged hierarchically with Path over Place. There is therefore a great temptation to equate Place with P and Path with *p*. I have not managed to motivate such a unification, however. One problem is that purely locative expressions have Figures, but do not obviously have a Path head (though they might; it could be exemplified with the AT head *a* of Zina Kotoko, cf. (4)). Another problem is that Path varies without any obvious variation over the selection of the Figure. These are open research questions.

More problematic for the hypothesis that the presence of *e* is a fundamental property of the category verb is the existence of non-verbs which appear to have run-times or imply changes of state. There are eventive nouns, for example *wave*, *stretch*, and *fall* in the following examples, which bear entailments of motion or change of state in their complements, even in the absence of verbal morphology.

- (90) a. A crisp wave of the flag signalled the start of the race.
b. She reached the cookie jar with a stretch of her arm.
c. The fall of Rome left the empire in disarray.

Such nouns, on this account, might bear variables with sufficient richness to support inferences of transition, unlike P—accordingly, each of these nouns can also appear as a verb. In the uses exemplified here, I assume that some piece of nominal structure, perhaps D, is sufficient to bind the *e* variable or *e*-like variable that these nouns appear to bear, without overt tense marking.

6 Conclusion

I have discussed some very general characteristics of the class of adpositions cross-linguistically, and the closely related class of spatial particles. I have argued that the argument structure that they introduce is subject to some very strong generalizations in terms of Figure and Ground, and that these generalizations can be captured by splitting the category into at least two parts: P, the Ground-introducing element, which expresses a spatial relation, and *p*, the Figure-introducing element. The nature of *p* can be seen in the type of Figure it permits; when this Figure is a DP, there are s-selectional restrictions, but more generally, it seems, *p* can determine what categories PP may modify.

I have discussed a striking limitation on the meaning of P elements crosslinguistically, that they do not introduce Figures as complements, nor do they introduce any other kind of dynamic complement. It is striking, for example, that no language appears to have an adposition that introduces an incremental theme of any kind. All languages have heads that introduce incremental themes, but they are always members of the class of verbs.

I suggested that this could be connected to tense. If tense can only bind a variable of sort *e*, for example, and nothing else, and if the interpretation of an argument as a Figure or an incremental theme always involves a mapping of (some property of) that argument onto a variable of type *e*, then two apparently independent properties are unified. A head which has *e*, then, will be susceptible to binding by tense and will be identified as a verb.

Abbreviations

1 first person, 3 third person, ABS absolutive, ACC accusative, AUX auxiliary, BA gloss for Chinese *ba*, CAUS causative, CLASS classifier, COM comitative, COMP completive, DAT dative, DUR durative, ERG ergative, ESS essive, FACT factual, FEM feminine, Fig Figure, F formative, GEN genitive, HORT hortative, ILL illative, INSTR instrumental, INTNS intensive, LOC locative, M masculine, N neuter, NE gloss for Mohawk *ne*, NEG negation, NOM nominative, NONFUT non-future, O object, PERF perfective, PL plural, POSS possessive, PUNCT punctual, REM remaining, S subject, SG singular

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