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 that the temporal dimension of V distinguishes it fundamentally from P.

1. Introduction

This article is a bird's eye view of adpositions and related expressions cross-linguistically. 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 and 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 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), should 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 the Ground.

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.

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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 those categories or not; if this is a necessary condition for a category being universal, then P may not be 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.

Of course, there is a quantitative difference between a category like P and a category like N or V, as languages have inventories of verbs ranging 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', cf. Everett and Kern 1997) and may never reach very much over a hundred or so (English again scoring high).

The smallness of the category may be an indication that P is a functional category, rather than a lexical one, though that designation depends very much on theory-internal assumptions regarding what it means to be a lexical or a functional category (cf. van Riemsdijk 1978). Given an explicit theory such as those of Marantz (2001) or Borer (2004) 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

Despite the existence of some adposition-poor languages, the degree to which unrelated languages have similar-looking adpositional inventories

is striking. Consider, for example, the following sample, including postpositions (from Lakota, a Siouxan SOV language, and from ’O’odham, an Uto-Aztecan aux-second language) and prepositions (from Persian, an SOV language, and from Chinese, which has mixed order). The lists here are meant to be illustrative, not exhaustive.

(1) a. ’O’odham (Zepeda 1983, Saxton and Saxton 1973)
am ‘at’
ab ‘at, on’
eda ‘in’
wui ‘to, toward’
we:m ‘with’
we:hejed ‘for (benefactive)’
da:m ‘on top of, above’
we:big ‘behind’
weco ‘under’
hugidan ‘next to’
ba’ic ‘in front of (person)’
ba:ʂo ‘in front of (thing)’
ta:gio ‘toward’
amjeḍ ‘about, from’
sa:gid ‘between’

b. Persian (Mace 1962)
dar ‘in’
bé ‘to’
as ‘from’
bâ ‘with’
bî ‘without’
joz ‘instead of, except’
barâ-yé ‘for’
taraf-é- ‘towards’
posht-é- ‘behind’
dâhkel-é- ‘inside’
pîsh-é- ‘in front of’
béin-é- ‘between’
bîrûn-é- ‘outside’
bedûn-é- ‘without’
zîr-é- ‘under’
tû-yé- ‘in, on’

(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’
aglágla ‘near, at edge of’
kaglá ‘by, near’
okó ‘between’
ókšan ‘about’
koáktan ‘across, beyond’
ópta ‘over, across’
opáya ‘along’
égna ‘among’
ohómni ‘around’
óhan ‘through’
akotanhan ‘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’
lí ‘apart from’
guānyu ‘concerning’
zhìyu ‘with regard to’
jù ‘according to’
gēn ‘with’
hàn ‘with’
hé ‘with’
lùn ‘by some unit measure’
bèi ‘by’ (passive agent)
bǐ ‘as’ (comparative)
wèile ‘for’
yòng ‘with’
gěi ‘for, to’ (indirect obj.)

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

(3) Northern Sámi (Nickel 1990)

	TO	AT/FROM	ALONG
‘in’	*sisa*	*siste*	
‘on’	*ala*	*alde*	
‘behind’	*duohkai*	*duohken*	*duogi*
‘under’	*vuollai*	*vuolde*	*vuoli*
‘in front of’	*ovdii*	*ovddas*	*ovddal*
‘beside’	*beallai*	*bealde*	*beale*
‘edge of’	*rádjai*	*rájis*	*ráji*

(4) Zina Kotoko (Holmberg 2002)

	BE AT	TO	HAPPEN AT/FROM
'in'	*a jí*	*(ná) jí*	*má jí*
'on'	*a gmá*	*(ná) gmá*	*má gmá*
'behind'	*a lyá*	*(ná) lyá*	*má lyá*
'under'	*a mwá*	*(ná) mwá*	*má mwá*
'near (person)'	*a ské*	*(ná) ské*	*má ské*
'near (thing)'	*a zwa*	*(ná) zwa*	*má zwa*
'in front'	*a fká*	*(ná) fká*	*má fká*
'among'	*a lwá*	*(ná) lwá*	*má lwá*

Also arranged along these lines are 'local' case systems, where the adpositional meanings are expressed by suffixes on the noun (examples here from Lezgian, a Nakho-Daghestanian language; conceivably, these suffixes are phonologically reduced postpositions, in which case they do not constitute a third type).

(5) Lezgian (Haspelmath 1993)

	AT	TO	FROM
'in'	*-0*	*-di*	*-aj*
'on'	*-l*	*-l -di*	*-l -aj*
'at'	*-w*	*-w-di*	*-w-aj*
'behind'	*-qh*	*-qh-di*	*-qh-aj*
'under'	*-k*	*-k -di*	*-k -aj*

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).

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 been classified as adpositions because they

translate English adpositions? What evidence is there that the languages in questions 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 (see 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 furtively.

(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 (there are dialects in which *right* is used with a broader range of categories, and for which (8d) is grammatical).

(8) a. right into traffic
b. right back to England
c. right up the tree
d. * right furtively
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 more closely to verbs (the following argument is based on one presented in Huddleston and Pullum 2002).

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—Patricia must have been running, Vera aiming, and Jane 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. In fact, PPs often seem to 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, owing, concerning,* and also *following* in the sense 'after' display 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 otherwise appear with verbal aspectual morphology, it seems most likely that these new additions to the category P do not still contain the verbal *-ing* morpheme observed in (9). 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.

2.2.1. 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 those words resist combination with aspectual particles like *le* and *zhe*.

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

Ordinary verbs regularly take *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 conclude that the category P exists in Chinese though many of its members are ambiguously verbs (they are often referred to as 'coverbs'). 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.

(13) 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 any perfective meaning (Li and Thompson 1981: 362).

An examination of the list of Chinese prepositions in (2b) 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*
'They repair televisions behind their house'

b. Wǒ bǎ qiānbǐ chā zài píngzi **lǐtou**.
*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 postposition may incorporate into the verb.

(17) a. Wo 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. Li Si ba zhei-ben shu fang-**zai**-le zhuozi-shang.
*Li Si BA this-CLASS book place-**at**-PERF table-top*
'Li Si put this book on the table' (Chinese; Sybesma 1992)[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).

(18) Northern Sámi case forms

	'fish'	'place'	'space behind'
NOM	*guolli*	*sadji*	*duohki*
ACC	*guoli*	*saji*	*duogi*
ILL	*guollái*	*sadjái*	*duohkái*
LOC	*guolis*	*sajis*	*duogis*
COM	*guliin*	*sajiin*	*dugiin*
ESS	*guollin*	*sadjin*	*duohkin*

The forms 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 boađán 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
'The horse ran (to) 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 *vuolde* 'at or from beneath,' illustrated in (23b), with the nominal forms in the case table in (18) (see Sammallahti 1998: 67 for remarks on the historical development of *vuolde*).[6]

(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. For example, *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.'

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 čievččastadje 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 to nouns.

(25) Dat ruohtai viesu (*sevdnjes) duohkai.
it ran house dark to.behind
'It ran (*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 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. Don čohkkát mu sajis.
you sit me place.LOC/at.place
'You're sitting in my place' or 'You're sitting instead of me'

b. Don čohkkát mu dábálaš sajis
you sit me usual place.LOC
'You're sitting in my usual place' (Northern Sámi; thanks to Berit Anne Bals)

The verb *čohkkát* would most naturally be interpreted in the second reading in (26a) as, for example, sitting on a committee.

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 seen 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, and so we can tentatively identify these words as belonging to a category P. To claim that the category P has some cross-linguistic substance, we must show that some features are shared across languages. Some typical properties of these adpositions are listed in (27), and discussed in turn.

(27) Typical properties 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 or proposition.

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. I return to these grammatical prepositions 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 the auxiliary is evidence that DP and P form a constituent.[7]

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

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.[8] 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 (29). There seems to be a certain degree of arbitrariness here; for example, 'out of' patterns with 'without' in Russian, against 'towards,' but in Icelandic 'out of' patterns with 'towards' and against 'without.'

(29)

Russian		Icelandic	
k 'towards'	DAT	*mót* 'towards'	DAT
iz 'out of'	GEN	*úr* 'out of'	DAT
pod 'under'	INSTR/ACC	*undir* 'under'	DAT/ACC
*mežd*u 'between'	INSTR	*milli* 'between'	GEN
bez 'without'	GEN	*án* '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 a CP), but not a DP (this is one kind of deviation from tendency (27b)).

(30) 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 understood in either of these two ways: either *in* takes objective case while *out* takes the so-called *of*-genitive, so that (31) illustrates c-selection for case, or else *in* takes a DP complement while *out* takes a PP, so that (31) illustrates c-selection for category.

(31) 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 (c-selection), but may determine that the subject be animate (s-selection). In this context I am interested in the s-selection by P for its complement; s-selection frequently surfaces in

the form of presuppositions. For example, *in* presupposes that its complement be a container, and is infelicitous when the complement is not container-like. Being a presupposition, the requirement is 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* takes a complement which consists of two parts, *inside* takes 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; mainly they have to do with shape, as with *between* and so on, or with composition, such as being water, or earth, and so on, or animacy, as in the Zina Kotoko words for 'near' (see (4)) or in the 'O'odham example here, where *ba:ʂo* can only be used with non-humans, and *ba'ic* is used with humans.

(32) a. 'am ki: ba:ʂo
there house in.front.of
'in front of the house'
b. 'am Mali:ya ba'ic
there Maria in.front.of
'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, 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 a Ground, following Talmy (1978, 2000a). 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.

(33) Talmy (2000a: 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.

(34) 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 a 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 (34) with the Ground as the object of the verb, and the Figure as the complement of the preposition, as illustrated in (35) (all of these sentences are grammatical, but cannot be used to describe the corresponding situations in (34)).

(35) a. # Max stuck his nose around his finger.
b. # We couldn't fish the punch without the frog.
c. # The kids put the tree among 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.

(36) 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 2000a for extensive discussion).

(37) 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.

(38) 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.[9]

(39) 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 (39a), *tomato juice* is the Figure and *the dog* is the Ground, by (33). Since (40b) can be used to describe the same scene, it would appear that *with* there introduces a Figure, contradicting (38). However, any Figure-like entailments do not come from *with*, which can introduce instruments, manners, accoutrements, or other accompaniments.

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

Analogous comments apply to (39d). In contrast, *on* in (39a) (and *onto* in (39c)) introduce a Ground specifically. This is true even in locative and

temporal cases like those in (41a) and (41b), and arguably even in abstract cases like that in (41c).

(41) 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; notice that the possibility of interpreting the complement of *with* as being in motion in (39b) and (39d) is very much dependent on the verb; that reading does not arise with different kinds of verbs.

(42) 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.

Though it seems safe to conclude that *with* is not the inverse Ground-Figure counterpart of *on*, this does not completely resolve the odd status of *with*, which does give rise to apparent Ground-Figure inversions in expressions like *a pot with a lid*. Harley (1995) discusses the similarity of *with* to the verb *have*; if Kayne's (1993) decomposition of *have* (into *be* combined with *to*) could be extended to *with*, then it might be that *a lid* in that expression is in fact a Figure, but a Figure of an abstract version of *to* embedded under *with*, as suggested in the following examples (compare Amritavalli's 2002 discussion of examples like (43a) and (44a)).

(43) a. There is a lid to the pot.
b. We fit a lid to the pot.
c. BE [a lid [TO the pot]]

(44) a. The pot has a lid.
b. We fit the pot with a lid.
c. the pot TO-BE [a lid [t_{TO} $t_{\text{the pot}}$]]

This is consistent with the fact that *with* appears with small clauses more generally (*With Laura dead, the cops will be looking for us*). Consider also that the apparent Figure-Ground reversal in *a pot with a lid* allows an overt *to*-phrase in *a pot with a lid to it.*

Thus, despite an apparent challenge from *with*, it seems that (45) can be maintained, certainly for clearly spatial P.

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

I suggest a stronger version of (38) and (45) in §4.

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 not a particle but 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 a particle is a Figure.

Particles share with adpositions all the characteristics which do not specifically refer to complements, namely they typically express relations (27a), though with an abstract or implicit Ground, 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 §§3.2.1–3.2.3.

3.2.1. Particle and category

Particles, like English *up, down, off, out, away* and so on, though often called adverbs in traditional grammars, are simply adpositions without complements (following Emonds 1972), as indicated by the distributional tests that I reviewed in §2.2; for example, particles may be complements to verbs like *dart*, may appear in the 'PP *with* DP' construction, and may be modified by *right*.

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

Particle is then not a distinct category, but a kind of P with a particular c-selectional frame. A given P may be a particle always (like *upstairs*) or sometimes (like *up*) or never (like *at*), depending on its own lexical properties.

Many of the world's languages have words that translate into or approximate English particles.

(47) a. Péter nem olvastz óket **fel**.
Peter not read them ***up***
'Peter didn't read them out' (Hungarian, É. Kiss 2002: 57)

b. Phúcè vĭ **thɛ** lɔ̀ né hi.
*child throw **up** stone at house*
'The child threw stones up at the house' (Eastern Kayah Li; Solnit 1997: 168)

c. P'anšá kiŋ **hékta-wap'a-taŋhaŋ** ékigle yo.
*suitcase the **back-nearby-from** 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 languages in question. In Hungarian, there is substantial overlap between the postpositional class and the class of particles or 'co-verbs' (see É. Kiss 2002, Rounds 2001), and the abstract meanings that they take on in conjunction with verbs underscore their resemblance to English particles. Eastern Kayah Li, a Tibeto-Burman language, raises questions similar to those surrounding the Chinese examples, as most of the particle-like words also occur as verbs (Solnit glosses *thɛ* as 'ascend'). The Lakota example shown here is complex, arguably a PP including an incorporated noun *hekta* 'that which is behind' (gloss based partly on Buechel 1939 and partly on Buechel and Manhart 2002).

In other cases the category of particles is more clearly P. In Scottish Gaelic and Malay, for example, the same elements which appear as prepositions can also sometimes appear without DP complements in constructions very similar to the Germanic verb-particle construction (on Scottish Gaelic see also Ramchand and Svenonius 2002).

(48) 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)

(49) 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 adpositions 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*). In the extreme, one might find fully distinct classes of particles and adpositions, though they might still both be subtypes of a 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 as 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 (50b) below with (17b) in §2.2.2 above.

(50) 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 this study; note, however, that deictic elements similar to Chinese *lái* 'toward the speaker' and *qù* 'away from the speaker' are very commonly integrated into adpositional systems cross-linguistically.

3.2.2. Particles and constituency

I claimed in §3.1 that P never introduces a Figure complement, but here in §3.2 I have been discussing the introduction of Figures by P elements. It is important, therefore, to show that such Figures are not the complements of P. One indication of this is the looser constituency observed between P and its Figure argument, compared with P and the Ground.

Of course, a particle may form a constituent with its sole argument, as any predicate might, as illustrated in the series of small clauses in (51).

(51) 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 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 (cf. (50)) in allowing a Figure argument to alternate in order with a particle, as illustrated here (compare the word order here with (48b) and (49b) in the previous subsection).

(52) Chuir mi **air** an coire.
*put I **on** the kettle*
'I put the kettle on' (Scottish Gaelic; thanks to Gillian Ramchand)

(53) Ahmad membawa **ke bawah** lampu itu.
*Ahmad brought **to down** lamp the*
'Ahmad brought the lamp down' (Malay; Salleh 1992)

Reordering 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, such as that in (54a), but far more common are rigid pre- and post-positions, as illustrated in (54b).

(54) a. seinää **päin** — **päin** seinää
*wall **into*** — ***into** wall*
'into the wall' — 'into the wall'

b. talon **edessä** — ?? **edessä** talon
*house **in.front.of*** — ***in.front.of** house*
'in front of the house' (Finnish; Manninen 2003)

The rigid ordering which is typical of P and its Ground argument contrasts with the looser relation between P and its Figure argument; the particle shift pattern seen in (52–53) is common, though there is great variation (even among closely related languages; Icelandic and Norwegian have English-like particle shift, while Swedish and Danish do not, cf. Taraldsen 1983, Svenonius 1996a,b).

3.2.3. Particles and c-selection

Recall from §3.1 that P exerts c-selectional restrictions on its Ground. The same P does not also exert c-selectional restrictions 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. 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.[10]

(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 out*
'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)

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 from that of the verb by itself.

(58) a. Ég lokaði dyrunum.
I shut the.doors.DAT
'I shut the door'

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.[11]

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 (30) there) that P may determine whether its complement is DP, PP, TP, 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 out the answer* 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, which brings us to the question of s-selection.

3.2.4. Particles and s-selection

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 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 with the other appliances.

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 at the lending library by saying that the book is *away*, nor at the borrowing library that the book is *over*. Full PPs may be used, in which case the idiomatic meaning of the particle is not invoked (*the book is away from Tromsø at the moment; the book is over here)*.

In general, it seems that the degree of influence that P has over its Figure, when that is expressed as a DP, is similar to the degree of influence a verb has over its external argument. There are, perhaps, better examples of s-selection in the verbal domain, for example the verb *straddle* requires a bifurcate Figure (*Budapest straddles the Danube*), and although *between* requires a bifurcate Ground, I do not know of an adposition which places that sort of shape constraint on its Figure (cf. Landau and Jackendoff's 1993: 226 imaginary preposition *betwaft*). As Talmy (2000a: 315–316) puts it, the Figure is typically treated as "pointlike." However, this might simply be due to the richer inventory of verbs as opposed to prepositions. I return to the s-selectional question in §5.

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.

Talmy (2000a) 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 2000a, ch. 6).

(63) a. [$_{\text{Figure}}$ I took care] in [$_{\text{Ground}}$ drying the cups]
b. [$_{\text{Figure}}$ She went home] after [$_{\text{Ground}}$ stopping at the store]
c. [$_{\text{Figure}}$ They stayed home] because [$_{\text{Ground}}$ 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.

Possibly, P in (64) assigns a role distinct from Ground, that of Experiencer, which is compatible with the weaker statement made in §3.1, (38) (P never introduces a Figure), but gives up the stronger statement (45) (P always introduces a Ground).

It is possible to imagine that the experiencer in each of these cases is a Ground in some extended sense of the term; to put it in Talmy's terms (cf. (33) in §3.1) would require, for example, the event of lying in (64a) to be a "conceptually movable entity" which is "oriented" relative to the complement of the preposition.

Similar 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 resolve the issues, 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

The danger in such an approach is that it becomes more difficult to maintain the strong predictive character of the generalizations. I will leave (65) as an hypothesis, rather than a conclusion, and 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 complement, it introduced a DP whose interpretation came from other aspects of the structure. 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 separately (cf. Kayne 2004, Cinque 2002, 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 'DP *with* PP' construction. As for modification by words like *right*, this generally fails when a 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 the clear lexical categories N and A. A likely scenario is that rather fine distinctions will ultimately have to be made among different subsorts of P, with generalizations like (65) only being relevant for the most contentful ones. At the extreme end of the scale, formatives with no descriptive content whatsoever may cease to be adpositions altogether 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 nominals. In many languages, it can be 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. Ana levantó a un niño.
Ana lifted to a child
'Ana 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; worse yet, in (69a) the DP following *a* is fairly 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 that it appears with, that being determined entirely by the verb. Furthermore, it displays some behavior which 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 marked with *a*, as in (70b) (the dative *a* is fused with the definite article in (70b)).

(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 effects of adpositions on verbal complements in §5. In the meantime I assume that the Figure-Ground generalizations hold for grammatical P at least in the weak form: No P introduces a Figure argument ((39) in §3.1); but given that there is so little thematic content to the relation between grammatical P and its complement, it may be pointless to extend the strong hypotheses in (65) in §4.1. to grammatical P (i.e. the internal argument is a Ground, the external argument 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-markers, we should not be surprised to find it marking 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 adpositional 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 first broadened and then 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 a 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 conceals 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, Travis 2000), 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 is quite robust, and is 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, an 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.[12]

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 to refer to the selection for semantic characteristics of the Figure by the particle. In the former case, Grounds were specified as containers, surfaces, bifurcate, water, the ground, human or non-human, and so forth. 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 (recall the discussion in §3.2.4 of the verb *straddle*).[13]

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, and a small number of members of category *v*, with very little encyclopedic content (e.g. simply the difference between Agent and Causer, or some other Aktionsartal distinction). 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 (Megerdoomian 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.

Thus, it might be expected that languages would have relatively small numbers of *p* elements. However, s-selectional properties of the

Figure may not be the whole story. The uses 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. Talmy (2000b) discusses the differing degrees to which languages create directed motion constructions using PPs. Baker (1996) argues that in Mohawk, PP may not take a subject directly, pointing out that despite the otherwise rich and obligatory agreement in the language, a PP cannot agree with a Figure (in (72), *Sak* is masculine, yet the PP can only take a neuter agreement prefix).

(72) a. Ka-nakt-óku wa-hi-ya't-áhset-e' ne Sak.
NSGS-bed-under FACT-1SGS.MSGO-body-hide-PNCT 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.MSGO-body-hide-PNCT NE Sak
(Mohawk; Baker 1996: 399, 402)

Rather, the most basic use of adpositional constructions appears to be as VP or sentence modifier. In such cases, there is no DP Figure; rather, the event stands in as the external argument of the relation, as discussed briefly in §2.2 (in fact, the agreement prefix on the Mohawk PP in (72a) suggests that *something* is functioning as its external argument, just not the DP object of the verb).

The question then arises how PP (the capital P-plus-Ground constituent) is related to the larger structures in which it finds itself. Plausibly, *p* is a kind of predicator (cf. Bowers 1993) which links P to another category. English, then, would have developed a *p* which can take a Figure DP argument directly, whereas Mohawk might not have. Another type of *p* would allow PPs to function as nominal modifiers; as far as I can tell, Chinese prepositional phrases do not do this, suggesting that that *p* is also not universally available.

The properties usually ascribed to different *v* heads can broadly be characterized as having to do with Aktionsarten or inner aspects, including the difference between internally and externally caused events. The closest analogy in the adpositional domain would be the difference between Paths and Places, that is, the directional versus locational use of PPs. This would in turn suggest that the Path heads observed in §2 are manifestations of *p*, as are some uses of English words like *to* and *from*.

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 bag.
b. The pressure escaped the bag.

(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. For example, there are no adpositional counterparts to verbs with 'Location' subjects, such as the following.

(79) a. The book contains six chapters.
b. A table supported the lamp.
c. The cabin housed a whole troop.
d. The bucket oozes slime.

The notional counterparts of *support* and *contain* in the prepositional realm would be the inverses of *on* and *in* respectively, so these sorts of verbs come close to reversing the Figure-Ground relations. Conceivably, they involve inversions of the type countenanced for *with* in §3.1; they seem to be fairly unusual.

Quite systematically, on the other hand, verbal internal arguments may be themes of directed motion, as in (80).

(80) a. May threw the radio.
b. She dropped the light switch.
c. They brought the evidence.
d. We catapulted an igloo.

Here, the subject is not a Location, but a Causer or Agent. These verbs might be thought of as containing a covert particle (as in Hoekstra 1988), so that the VP-internal argument is the external argument of a covert particle.

Another typical kind of internal argument for verbs which is not found as an argument of an adposition is the incremental theme of a change of state verb, where the theme is asserted to undergo a change of state over the run time of the event, as in (81).

(81) a. May melted the radio.
b. She painted the light switch.
c. They destroyed the evidence.
d. We built an igloo.

In these cases, the additional possibilities involve a notion of change in some property of the object. Such entailments of change are often eliminated when an adposition is added, for example in the conative construction.

(82) a. The donkey ate the saddle. (|= saddle is gone)
b. The donkey ate at the saddle (|≠ saddle is gone)
c. Svetoslav cut the rope (|= rope is severed)
d. Svetoslav cut at the rope (|≠ rope is severed)

A fundamental difference between an accusative direct object and an oblique is that the accusative is in some sense the measure of the event, whereas the oblique is not. For example, (83a) is felicitous even if the truck could hold 300 crates of beer, as the direct object *a crate* is appropriately affected; but in the same context, (83b) is infelicitous, because the direct object *the truck* is not sufficiently affected (context can improve it of course, for example if it is a very precious crate of beer, or if the point is that Catherine is being wasteful of resources).

(83) a. Catherine loaded a crate of beer onto the truck.
b. # Catherine loaded the truck with a crate of beer.

Much work has centered on the ways in which an event formally maps onto a direct object, or onto some salient property of the object (Krifka 1992, 1998, Tenny 1994, Ramchand 1997, Hay et al. 1999, Borer 2004, Rothstein 2004, Kratzer forthcoming).

With directional adpositional complements, there is also a mapping, of the event onto a Path. A typical Path-denoting PP determines a Path with the Ground as a single anchor point, so that there is no mapping of the event to the Ground itself.

(84) a. Sal stretched the tape to the window.
b. Christine sprayed paint on the wall.

However, if the meaning of the adposition is such that the physical extent of the Ground maps onto the extent of the Path, then the Ground may be indirectly mapped onto the event, via the Path.

(85) a. Sal stretched the tape across the window.
b. Christine sprayed paint all over the wall.

In (84a), the window is simply treated as a point (the endpoint of the Path), but in (85a), the width dimension of the window is mapped to the Path, which is mapped to the event. Similarly, in (84b) only contact is necessary, but in (85b) the extent of the wall determines the completeness of the event.

The conative construction exhibited in (82) is then rather similar to the constructions in (84); the Ground is embedded under *at*, which returns only a pointlike space, making it impossible to map the event to the Ground.

Thus, it is not strictly true that adpositional complements cannot undergo change like the complements of the verbs in (81); but in order for there to be an entailment of change, there has to be a mapping to an event. Mapping to events is closely connected to case, and a DP can only have one case. If it receives case from an adposition, it will not also receive case from the verb, and so can only participate in mapping to the event indirectly, via a possible Path structure.

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).

(86) 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)

(87) 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 (86a) and (87a) are used only when the Ground is in motion, while the postpositions in (86b) and (87b) are neutral. At first, this would appear to make these postpositions more like verbs of directed motion of the type in (80). However, the implications of motion here are presuppositional, more like the s-selectional restrictions discussed in §2.3, where adpositions were shown to presuppose of their Grounds that they be water, or containers, and so on. In (86a) and (87a), motion is presupposed, as can be seen when such examples are negated.

(88) 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, unlike the case with verbs of directed motion (for example *May didn't throw the radio* does not imply that the radio moved). Thus, the generalization (38), that the complement of P is never a Figure, can be upheld, as the Figure in these examples is still clearly the Buick—in fact, these examples are even consistent with the stronger (65).

5.4. Tense versus specifiers

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 V and P, 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 it 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 signs of a phonological EPP (Holmberg 2000); EPP appears to be absent in Irish (McCloskey 1996); EPP is arguably active in C in Dutch and German, In T in English, and in both in Mainland Scandinavian (Roberts and Roussou 2002)).

Baker, in arguing that PP does not have a specifier, 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 (89).

(89) "(In certain languages, certain) tense 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 (89). 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 (89) unsatisfying. It makes the false prediction, for example, that A and N should easily combine with tense when they do not have subjects. Furthermore, (89) does not seem to follow from anything. If (89) 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).

A closer approximation to the cross-linguistic facts would appear to be (90).

(90) a. Tense/Aspect must bind a variable e
b. The variable e must be bound by Tense/Aspect
c. All V bear e
d. No P bears e

The absence of adpositions carrying entailments of change over their complements, except in conjunction with verbs, would be linked to the fact that adpositions are unable to introduce variable with the sufficient temporal dimension.

Baker (2003) considers and rejects the idea that verbs are distinct from other categories in bearing a neo-Davidsonian event variable (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. The real test between (89) and (90) would be to determine what other properties can be correlated with e, and whether they can be demonstrated to also correlate with the possibility of being tensed. That being a whole new topic, I must set it aside for the time being.

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 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, which is a predicator and allows PP to be predicated of other material. The nature of *p* can be seen in the type of Figure it permits, with the possibility of DP, NP, and VP Figures varying somewhat cross-linguistically.

Landau and Jackendoff (1993) discuss some differences between adpositions and nouns, concluding that such differences stem from a deep fact about human cognition. Baker (2003) proposes a formal property of nouns (identity criteria), which would serve to distinguish them from adpositions. Here, I focus more on differences between adpositions and verbs, especially regarding the wider range of arguments verbs may introduce. I speculate that this might partly be due to the richer lexical content of verbs, but also to the richer event structure borne by verbs, a kind of event structure which interacts directly with temporal and aspectual operators, providing a contrast to adpositions.

Abbreviations

1 first person, 3 third person, ACC accusative, AUX auxiliary, BA gloss for Chinese *ba*, CLASS classifier, COM comitative, DAT dative, DUR durative, ESS essive, FACT factual, FEM feminine, GEN genitive, ILL illative, INSTR instrumental, LOC locative, M masculine, N neuter, NE gloss for Mohawk *ne*, NEG negation, NOM nominative, O object, PERF perfective, PL plural, POSS possessive, PNCT punctual, S subject, SG singular

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Notes

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

[3] I retain Sybesma's glosses and orthographic conventions here; he represents what I am calling DP-postpositional sequences as N-N compounds, writing *shàng* as *-shang* and glossing it as 'top'; Li & Thompson (1981) generally gloss it as 'on.'

[4] All 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 Berit Anne Bals, Marit Julien, and Kristine Bentzen for discussion.

[5] Sámi 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.

[6] In my examples I have also preserved from Nickel (1990) an orthographic distinction between the postpositional forms *vuollai* and *duohkai* and the illative case forms *vuollái* and *duohkái*, though speakers I have consulted do not pronounce them differently; possibly because the true nominal forms with long vowels are archaic, see below.

[7] The omission of the determiner *g* from the fronted PP is a systematic fact of 'O'odham syntax.

[8] This requires a few qualifications. Icelandic is famous for its quirky subjects, but quirky subjects are virtually always experiencers (Jónsson 2003) or internal arguments promoted to subject position (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 not determined verb-by-verb but for a class of constructions, thus is not a matter of c-selection by individual verbs.

[9] Talmy (2000a:333ff.), too, observes that the complement of P is usually a Ground, but argues specifically that *with* and *of* introduce Figures, contra (38), in examples like the following.

(i) a. The room slowly filled with smoke.
b. I slowly drained the fuel tank of gasoline.

I discuss *with* here; *of* is briefly discussed in §4.

[10] To 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.' Interactions of case and particles in Icelandic are discussed more fully in Svenonius (2001).

[11] Maling (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 the 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.

[12] The chief exception to this pattern in the verbal domain is the one seen in ergative constructions, where the external argument appears to receive ergative case relatively low, leaving the internal argument to seek nominative case higher up; the situation is vaguely similar to the one I sketched for *with* in §3.1.

[13] Some languages have morphemes which place shape restrictions on Figure arguments (cf. Talmy 2000b), but it is not clear what relationship they bear to the category P. In general, specific s-selectional restrictions over the external argument are not assumed to characterize specific members of the category *v*, so since I am pursuing a general analogy between *v* and *p*, I will not discuss these Figure-conflating morphemes here.