Locations and binding domains[1]

Noa Bassel (noa.bassel@mail.huji.ac.il)

Prepositions of relations in space are known to enable free variation of pronouns and reflexives, which is mostly attributed to discourse factors like point of view, prominence, and expectation. This had previously raised doubts that pronominal licensing can be predicted from the syntax. The current paper shows through new evidence from Modern Hebrew that controlling for both syntactic and discursive factors reveals consistent patterns, where the choice of pronominal form is predictable from the preposition's meaning (path or place) and syntactic position (complement or adjunct). In particular, I show that a subset of spatial PPs – place phrases in argument positions – create independent binding domains where the interpretation of anaphors is restricted. The data supports a split PP hypothesis as suggested by Svenonius (2003) and suggests that the independent status of these PPs arrives from a phase head *p,* which selects place prepositions and introduces a local subject.

1. Introduction

Pronominal systems are known to show regularities with respect to the morphological composition of pronouns and their possible meaning and sentence positions. A well-known regularity of this sort is demonstrated in (1), where a complex reflexive pronoun has to share its reference with the nearest subject, while a simple object pronoun in the same position is understood as referring to someone else (Lees and Klima 1963, Langacker 1966, Faltz 1977).[2]

(1)   *Complementarity between simple and reflexive pronouns:*

    (a)   They$_1$ saw {*them$_1$/themselves$_1$} in the mirror.

    (b)   Hebrew:

        sara$_1$ ra'ata {*ota$_1$ / et   acm-a$_1$}   ba-mar'a.

        S.   saw   her   ACC self-3SG.F in.the-mirror

---

[2] The data presented in this paper includes quoted literature examples and new data with broadly accepted judgments. I take the quoted examples to represent the authors' grammar. Novel judgments were confirmed with 5-7 native speakers of the reported language. Logophoric examples in English are known to be dialectal and should be taken as such.

(c) Turkish:

Hasan₁ {*onu₁/ kendini₁}   aynada   gordu.   (Faltz: 1977: 4)

H.   3SG   self.3SG.ACC mirror.LOC saw

In many such examples, the choice between the pronoun and the reflexive seems to be fully predictable based on their distance from the coreferring noun. Since this pattern was shown to emerge across languages and regardless of previous conversational context, it was taken to indicate the existence of syntactic restrictions that are independent from the discourse.

Conditions A and B of the Binding Theory (Chomsky 1981) derived these restrictions by defining a domain – the minimal phrase that contains the anaphoric expression and a subject – where reflexives are coreferential and pronouns are disjoint. Similar concepts of locality were defined within more recent frameworks, such as Reflexivity Theory (Reinhart and Reuland 1993), and Phase Theory (Chomsky 2001, Lee-Schoenfeld 2004).

The view that pronouns and reflexives are triggered by contrasting syntactic reflexes is often challenged due to a recurring observation in the binding literature, stating that the complementarity of these elements breaks down when they are embedded under prepositions, as seen in (2).

(2) *Non-complementarity in P anaphors*:

(a) John₁ saw a snake next to {him₁/himself₁}.

(b) Max₁ rolled the carpet over {him₁/himself₁}.   (Reinhart and Reuland 1993: 67)

This pattern disrupts the general regularity of pronominal reference, first because it is unexpected in a system based on locality constraints, and second because it was found to be inconsistent across prepositions and languages. For example, in Modern Hebrew, equivalent sentences are only acceptable with the simple pronoun in the case of the preposition *leyad* 'next to' (3a), while *misviv* 'around' allows the same interchangeability observed in English (3b).

(3) *Modern Hebrew PPs show a different pattern of pronominal licensing:*

(a) sara₁ ra'ata naxaš {lejad-a₁/   *lejad   acma₁}.

S.   saw   snake next.to.her next.to herself

'Sara saw a snake next to her/*herself.'

(b) sara₁ gilgela et   ha-štixim {misviv-a₁/ misviv le-acma₁}.

S.   rolled ACC the-carpets around-her around to-herself

'Sara rolled the carpets over her/herself.'

The variability of pronominal licensing in spatial contexts raised doubts that syntactic distance determines pronominal relations, for obvious reasons: if there are restrictions on pronoun coreference that follow from distance, they are expected to operate at every level of embedding, including PPs of spatial relations. Consequently, the question of whether the same rules that generate the pronominal distribution in (1) also govern it in (2)-(3) became charged with theoretical implications beyond the immediate scope of explaining the grammatical status of certain P anaphors. This question has received many different treatments, which I divide into four lines of analyses based on the assumptions and type of solutions they offer.

(i)   Maintaining syntactic constraints while exempting spatial prepositions from them for independent reasons.

(ii)   Maintaining syntactic constraints and including the perspective from which a sentence is uttered as a possible source for local coreference.

(iii)   Abstracting away from the notion of syntactic locality and deriving the variation from discourse conditions.

(iv)   Maintaining syntactic constraints and deriving the variation from the PPs' underlying structure.

The current paper shows that a type-four account explains contrasts in the distribution of spatial P anaphors that are not motivated in other of the other approaches, indicating that restrictions posed by syntactic distance hold in PPs as in other sentence positions.

The first line of analysis, most notably represented by Hestvik (1991), Pollard and Sag (1992), and Reinhart and Reuland (1993), suspends or modifies locality constraints in the context of spatial prepositions due to their intermediate status as predicates. These accounts rely on the fact that spatial prepositions seem to assign thematic roles exclusively to internal arguments to argued that this triggers discrepancies between the domains of Conditions A and B, and result in the interchangeable pronoun licensing demonstrated above. In **Section 2** I discuss the interaction of these ideas with well accepted, though conflicting, analyses of spatial PPs (Williams 1980, Hoekstra 1988), and argue that they over-generate in the sense that they predict that all Spatial P anaphors will be in free variation, in contrast to cases like (4).

(4)   *English spatial anaphors are not always interchangeable*:
John$_1$ aimed the gun at{*him$_1$/himself$_1$}.

Section 3 presents the now well-accepted view that locality constraints govern not only the DP in a given sentence, but also the perspective from which the sentence is pronounced. This idea goes back to Ross (1970) and has been investigated extensively by Charnavel and Sportiche (2016) and Charnavel (2019, 2020). Since a sentence can be stated from different perspectives, representing perspective in the syntax leads to a wider array of anaphoric possibilities without dismissing locality constraints. I then employ diagnostics put forward by Charnavel and others, to show that the source of anaphoric variability in contexts like (2)-(3) do not interact with perspective, but raher emerge regardless of the point-of-view holder's identity. This includes inanimate contexts, where the antecedent has no independent point of view, as in (5).

(5)　*The Hebrew pattern is replicated with inanimate anaphors (compare with (3)):*

　　(a)　ha-radar　ziha　　　matos { lejad-o$_1$/ *lejad　acmo$_1$ }.

　　　　　the-radar　detected　plane　next.to-it　next.to itself

　　　　　'The radar detected an aircraft next to it/*itself.'

　　(b)　sadot$_1$　magnetijim　yocrim　zirmej　xašmal

　　　　　fields　magnetic　　generate　streams　electricity

　　　{ misviv-am$_1$/　misviv le-acmam$_1$ }.

　　　　around-them　around to-themselves

　　　　'Magnetic fields generate electric streams around them/themselves.'

A similar conclusion emerges following the third line of analysis in **Section 4**, where constraints on anaphoric licensing are derived from discourse conditions and statistical generalizations (Kuno 1987, Ariel 2008). I will show that discourse conditions only account for a portion of the variation in the spatial domain, whether these conditions are grounded in the syntax or not. In particular, spatial PPs will be shown to go against the well-known generalization according to which predicates that regularly occur with disjoint arguments require a morphologically marked pronoun for coreference (Kemmer 1993, Haspelmath 2007). Spatial prepositions typically select locations rather than individuals, which makes their complement disjoint by default, and yet corpus studies such as Ariel (2008) report that they tend to express coreference via simple pronouns, as in (6).

(6)　Can you$_1$ reach the pepper behind you$_1$?　　　　　　　　　(Ariel 2008: 36-37)

The fourth and final approach, which is the one I argue for in the current paper, assumes that locality constraints hold without exception, and that contrasts in the distribution of SPAs should also be affected by the internal structure of the PP. The main challenge for this line of analysis has so far been that the observed contrasts are obscured by the pragmatic effects discussed in sections 3-4. In **Section 5**, I suggest facing this challenge by looking into reflexive pronouns that lack a logophoric interpretation, such as the Modern Hebrew reflexive *acm-*. I then show that the acceptability of Hebrew pronominal is not sensitive to perspective or physical contact but rather to the preposition that defines the spatial relation. The pronominal licensing patterns of different Hebrew prepositions is demonstrated in (7) .

(7)   *Anaphoric licensing across prepositions (Hebrew):*

(a)   sara zoreket et   ha-kadur {el/ le'ever/me'al / sviv * lejad/ * mul}   acma$_1$.
S.   throws ACC the-ball   to toward above around next.to in.front.of herself
'Sara throws the ball to/above/toward/ around/*next to/*in front of herself.'

(b)   sara zoreket et   ha-kadur{*ele-/*le'evr-/ me'ale-/ sviv- lejad-/ mul-}   a$_1$.
S.   throws ACC the-ball   to   toward above   around next.to in.front.of her
'Sara threw the ball *to/*toward/ above/ around/ next to/ in front of her.'

The fact that these patterns are not sensitive to changes in perspective suggests they are not constrained by logophoric binders. I argue that the pronominal element by which these prepositions express coreference is determined by properties of the preposition itself, and particularly whether it denotes a fixed spatial relation or a path of motion.

These meaning components are known since Jackendoff (1973) by the respective terms place and path, and are thought to be represented as different projections in the PP spine. I argue that dividing spatial PPs according to this lexical categorization and the PP's merging site creates four sets that are predictable with respect to pronominal licensing.

	Place	Path
Adjunct	A	B
Argument	D	C

Table 1: Typology of spatial PPs

The four classes of spatial relations above give rise to different binding domains, such that only PPs of Class D are independent and opaque to binding by external DPs. This is reflected in

the following properties, whereby Class D PPs (i) permit pronoun coreference across the preposition; (ii) ban reflexives in Hebrew; and (iii) only license English reflexives through logophoric binding, which is expressed in typical discourse effects. This pattern distinguishes place arguments (Class D) from both path arguments (Class C) and place adjuncts (Class A). Representative examples are given in (8).

(8)

(a) Place adjuncts: *She$_1$ read a book next to {her$_1$/herself$_1$}.	(b) Path adjuncts: *She$_1$ shouted toward {her$_1$/herself$_1$}.
(d) Place arguments: She$_1$ dropped the boomerang next to {her$_1$/herself$_1$}.	(c) Path arguments: She$_1$ threw the boomerang toward {*her$_1$/herself$_1$}.

Following previous conceptualizations of the binding domain as the spell-out domain in phase theory (Chomsky 2001, 2008, Lee-Schoenfeld 2004, Charnavel and Sportiche 2016), I take PPs that restrict anaphoric binding to be independent phases that have their own local subject. The observation that this status only holds for place prepositions surfacing as arguments supports a theory of split P (Svenonius 2003), according to which the phase head is a silent head *p* that introduces the preposition's subject.

I explain the ability of certain Hebrew prepositions (e.g., *me'al* 'over, above', *(mi)sviv* 'around') to take both the pronoun and the reflexive, as evident in (7-a), by the fact that these prepositions are ambiguous between a place and a path meaning. To illustrate, *sviv* can either denote a path around an object or the general area around it. Accordingly, the choice between a pronoun and a reflexive in a sentence like (3b) yields different truth conditions, as shown in the following sketch.

sara gilgela et ha-štixim sviva
'Sara rolled the carpets around her'
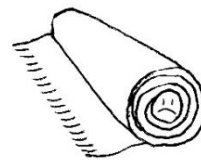
sara gilgela et ha-štixim sviv acma
'Sara rolled the carpets around herself'

The examples in (9) show that in contexts that allow only one of the meanings of *sviv*, one of the pronominal forms is unacceptable.

(9) (a) *Path reading:*

kadur ha-arec$_1$ mistovev {*sviv-o$_1$/ sviv acmo$_1$}.

ball.of the-earth turns around-it around itself

'The earth spins around *it/itself.'

(b) *Place reading:*

le-kadur ha-arec$_1$ yeš kim'at xamešet alafim lavjanim

to-ball.of the-earth exist almost five thousands satellites

{sviv-o$_1$/ *sviv acmo$_1$}.

 around-it around itself

'The earth has nearly 5,000 satellites around it/*itself.'

Section 6 outlines the paper's proposal, under which spatial PPs map onto three possible syntactic configurations, which constrained pronominal licensing accordingly: Place arguments contain local subjects and form independent binding domain, where coreference is expressed by simple pronouns; path arguments are part of the verb phrase and therefore require reflexives for coreference; adjunct PPs are also part of the verb's binding domain, but ban coreference due to a semantic contradiction. **Section 7** concludes the paper.

2. Locality constraints on pronominal reference

Early works in generative grammar formalized rules of anaphoric dependencies such that they would explain environments where pronominal reference is predictable and complementary, as in (10). Lees and Klima (1963) proposed an account grounded in locality, where complex pronouns are specified for clause-mate coreference, while simple pronouns express coreference between clauses.

(10) *Complementarity in pronominal reference:*

(a) He$_1$ sees {him$_{*1}$/himself$_1$}.   Direct object

(b) Mary$_1$ considers {her$_{*1}$/herself$_1$} intelligent.   ECM complement

(c) Mary sent the letter to {her$_{*1}$/herself$_1$}.   Dative argument

Pronominal forms occurring in spatial PPs, which I henceforth refer to collectively as Spatial P Anaphors or SPAs, did not straightforwardly fit into this distinction, due to an

inconsistency in the choice between pronoun and reflexive. To illustrate, in (11)-(13), clause-mate coreference is expressed by reflexives in the (a) cases, and pronouns in the (b) ones, despite being constructed with minimal syntactic variation.

(11) *Inconsistent SPA licensing:*

    (a) The men$_1$ cast a smokescreen around themselves$_1$.   (Lees and Klima 1963: 12-13)

    (b) The men$_1$ found a smokescreen around them$_1$.

(12) (a) John$_1$ smeared the oil on himself$_1$.   (1963: 34-44)

    (b) John$_1$ ignored the oil on him$_1$.

(13) (a) I aimed it at myself.   (Chomsky 1965 p.146-147)

    (b) I pushed it away from me.

The cited sources did not report the acceptability of the alternative pronominal forms in these examples, but rather stated that the chosen forms are preferred in these contexts. For Lees and Klima's analysis, it was unexpected that pronouns would refer to the subject of the clause they are part of, leading to the claim that the embedding prepositions marked reduced relative configurations equivalent to the ones in (14).

(14) *Spatial PPs as relative clauses:*

    (a) The men found a smokescreen [(that was) around them].

    (b) John ignored the oil [(that was) on him].

If these PPs indicate a bi-clausal structure, then the pronouns express a non-local dependency, in accordance with the examples in (10). However, this account could not predict which PPs would turn out to be independent clauses before SPA licensing was taken into account. Similarly unpredictable contrasts were raised by Wechsler (1997).

(15) *More untriggered contrasts in SPA licensing (Wechsler 1997: 38-39):*

    (a) Bubba$_1$ tossed the beer can behind {him$_1$/*himself$_1$}.

    (b) Bubba$_1$ tossed the beer can to {*him$_1$/himself$_1$}.

(16) (a) Corporal Crump$_1$ pinned the medal beside {him$_1$/*himself$_1$} (on the wall).

    (b) Corporal Crump$_1$ pinned the medal onto {*him$_1$/himself$_1$}

Further complication followed from the definition of the tensed clause as the local domain for anaphoric interpretation, which required additional transformations in any case of

pronoun coreference within the clause. This was resolved in the Government and Binding framework, which defined the local domain in terms of theta and case assignment.

The proposed concepts of Governing Category (Chomsky 1981), Complete Function Complex (Chomsky 1986), and Syntactic Predicate (Reinhart and Reuland 1993), varied in their technical details, but shared the insight that (i) the range of semantic and syntactic operations that a predicate takes part in defines its local domain, and (ii) the subject position limits locality. Another organizing principle was that the syntax does not restrict all types of coreference, but only the relation of binding, where the antecedent C-Commands the dependent noun (Reinhart 1976, 1983).[3]

The same principles were largely maintained in minimalism, where Chomsky (2001, 2008) suggested that the import from speakers' sentence building mechanism to phonetic output occurs in phases rather than word by word. Chomsky characterized the phase as a functional heads that trigger the delivery of its C-Command domain to the interfaces with semantics and phonetics (LF, PF, respectively). This step is known as spell-out, and its consequence is that the linguistic material in one phase cannot be accessed in the next one, excluding the left edge position, which remains accessible and enables long-distance operations.

Since the phase is independent at the interface, it restricts movement, thematic assignment, and variable binding, and include a local subject (Chomsky 2001, Legate 2003, see also Citko 2014), which makes for a similar definition of locality to those reached by previous frameworks.

Numerus works since Lee-Schoenfeld (2004) have identified the binding domain of reflexive pronouns with the phase (Canac-Marquis 2005, Quicoli 2008, Antonenko 2012, Despić 2015), or with the spell-out domain (Charnavel and Sportiche 2016). This means that, despite many developments in syntactic theory, the presence or absence of a PP internal subject have remained essential to the understanding of prepositional binding domain.

---

[3] The Binding Theory did not distinguish complex anaphors like the English *self*-anaphor form simple anaphors like the French *se*, German *sich* etc, which are known to have larger domains of interpretation, while Reinhart and Reuland (1993) accounted for both classes under one system. The current paper's focus is on complex anaphors, following observations that they seem to constitute a separate phenomenon (Faltz 1977, Déchaine and Wiltschko 2017), and that simple reflexives themselves include more than one class (Maddox 2021, Siloni forthcoming).

2.1 Are spatial prepositions local?

Independently of the discussion on pronominal licensing, Hoekstra (1988) proposed that all spatial prepositions project small clauses where the subject corresponds to the located entity, known elsewhere as the Figure argument (following Talmy 1976).

(17) *PPs as small clauses (Hoekstra 1988: 9-10):*
    (a) I want [him off my ship].
    (b) With [John behind the wheel]...

This analysis takes such PPs to denote not just locations, but the states the hold between them and located entities. Applying this structure to the sentences in (11) makes *smokescreen* the subject of a small clause projected by *around*, which would then function as the binding domain for pronominal relations. Since the antecedent *the men* is external to this domain, locality constraints correctly predict the acceptability of the simple pronoun in (18b), but not that of the reflexive in (18a).

(18) *The small clause analysis does not predict the contrasts in pronominal licensing:*
    (a) The men$_1$ cast [$_{PP}$ <u>a smokescreen</u> around themselves$_1$].
    (b) The men$_1$ found [$_{PP}$ <u>a smokescreen</u> around them$_1$].

While this approach has been widely accepted (e.g., Svenonius 2003, Folli and Ramchand 2005, Folli and Harley 2006, Ramchand 2008, Gehrke 2008, Mateu and Acedo-Matellán 2012, Wood and Marantz 2017), opposing views argued that spatial PPs add locative information to events by incorporation, which creates a complex predicate (Williams 1980, M. C. Baker 1988, Neeleman 1994, Rothstein 2006, 2012, 2013, Bruening 2010, den Dikken 2015, Boneh and Nash 2017, Gehrke 2008 takes a combined approach). This offers a different analysis of (11), where three DPs are co-arguments of *cast-around* and *found-around*, as in (19).

(19) *Spatial PPs as complex predicates:*
    (a) (((((cast (around) them) a smokescreen) the men).
    (b) (((((found (around) them) a smokescreen) the men).

Now the licensing of the reflexive is expected, but the pronoun violates locality restrictions by being part of the same predication, and hence of the same binding domain as its antecedent.

The two lines of analysis therefore have conflicting predictions with respect to SPA licensing. Nonetheless, each predicts a consistency where either reflexives or pronouns are

expected in spatial contexts, which past literature failed to show. A further challenge is raised by SPAs that are completely interchangeable between the reflexive and the pronoun, like the well-known examples in (20).

(20)   *Non-complementary distribution of pronouns and reflexives:*

    (a)   John$_1$ saw a snake next to{him$_1$/himself$_1$}.

    (b)   John$_1$ spilled the gasoline all over {him$_1$/himself$_1$}.   (Kuno 1987: 9.24)

Since a position cannot be local and non-local to the subject at the same time, the existence of such cases seemed to undermine a syntax-based account of SPA licensing altogether. The next subsection presents some of the attempts to account for this phenomenon without abandoning the rules of binding.

2.2   Excluding spatial prepositions from locality-based constraints

The observation that SPAs do not show the same complementarity as object pronouns motivated lines of research that define locality in a way that does not apply to spatial prepositions. Hestvik (1991) and Büring (2005) suggested that only the binding domains of reflexives contain local subjects, while the binding domains of pronouns are the minimal thematic domains they occur in, regardless of whether a subject is included.

This means that the binding domains of pronouns and reflexives do not overlap in predicates that take internal arguments, and not an external one. Since this is their view of spatial PPs, the authors suggested that pronouns can be free in the PP's theta domain (21a), while reflexives are bound within the IP (21b).

(21)   (a)   *Pronoun binding domain:*

        John found a snake [next to him.]

    (b)   *Reflexive binding domain:*

        [John found a snake next to himself.]

This raises a problem of over-generation: if prepositions that assign a locative thematic role trigger non-overlapping binding domains, it is expected that any spatial PP would give rise to the same variation in pronominal licensing. However, (22) shows that prepositions that denote a path rather than a fixed location often do not exhibit this variability, despite being theta assigners.

(22) *Complementary P anaphors in English (adapted from attested web examples)*:

    (a) John$_1$ aimed the gun at {*him$_1$/himself$_1$}.

    (b) Kobe Bryant likes to pass the ball to {*him$_1$/himself$_1$} off the backboard.

    (c) Try to copy the folder into {*it$_1$/itself$_1$}.

    (d) Can$_1$ Superman see through {*him$_1$/himself$_1$}?

To fit such cases into the analysis requires stipulating either that path prepositions do not assign thematic roles in the sense that other spatial prepositions do, or that they block coreferential pronouns independently of locality constraints. The first option would parallel paths with goal prepositions, that mediate the thematic role that arrives from the lexical semantics of the verbs. This would lead to another conflict, since path prepositions encode many different path meanings, while goal prepositions tend to have a rather fixed meaning.

(23) *(Non-) Diversity in meaning: Goal vs. Path:*

    (a) Sara sent letters to the office.

    (b) Sara ran {to/toward/around/under/through} the office.

The need to exclude paths also applies to predicate-based approaches, that define locality as co-argumenthood, and determine that a reflexive pronoun must be bound by a co-argument *if it has one* (Pollard and Sag 1992, Reinhart and Reuland 1993). In these frameworks, reflexives that surface as sole arguments of their predicates can be free of local binding, with independent conditions banning them from occurring in subject position.

As with Hestivk's approach, the predicate-based frameworks did not adopt a small-clause analysis for spatial PPs, but rather assumed that they have one argument which is not visible to Condition A. Such reflexives were assumed to be constrained by discourse conditions, in particular the perspective from which the utterance is made. This is demonstrated in (24) for reflexives occurring in subject-less nouns, and should also hold for SPAs: the long-distance *himself* is acceptable when the whole sentence reports John's thoughts and plans (24a), but not when Mary's perspective is reported (24b).

(24) *Discourse effects on anaphor licensing (Pollard & Sag 1992 p.274):*

    (a) John$_1$ was going to get even with Mary.
         That picture of himself$_1$ in the paper would really annoy her.

    (b) *Mary was quite taken aback by the publicity John$_1$ was receiving.
         That picture of himself$_1$ in the paper really annoyed her.

Reinhart an Reuland explicitly argued against a small clause analysis of these PPs, showing that small-clause constituents of perception verbs restrict reflexive dependencies (25a), and that spatial PPs do not fall into the same pattern (25b).

(25) *Small clauses vs. spatial PPs (Reinhart and Reuland 1993: fn.31):*
    (a) Lucie$_1$ heard [Max$_2$ praise her$_1$/*herself$_1$].
    (b) Max$_1$ rolled [the carpet$_2$ over him$_1$/himself$_1$].

The complex predicate analysis faces a similar problem, since it sees the SPA as a co-argument of both the subject and the object, which should ban pronouns categorically. Both analyses of spatial PPs therefore fall short in explaining the distribution of SPAs, in both traditional binding approaches, and predicate-based ones. A direction which has not been pursued by these frameworks, which I return to in Section 5, is that spatial prepositions vary in their constituent structure, and that this triggers some of the observed contrasts.

What became clear, however, is that a purely syntactic analysis is not able to capture the accumulating data. The following section focuses on attempts to explain cases like (25), which led to the view that locality constraints do not only restrict relations between the overt DPs in the sentence, but also between them and the source of the sentence.

3. Local perspectives

The previous section showed how the interchangeability of reflexives and pronouns in spatial contexts countered the complementarity prediction that follows from binding theory.

The default assumption for such instances has often been that it is the reflexive that violates locality constraints when taking a pronoun position, and that privileged discourse conditions render such violations less costly. This is reflected in some of the labeling used to describe non-complementary reflexives, e.g., irregular reflexives (Cantrall 1974), discourse-level anaphors (Zribi-Hertz 1989), exempt anaphors (Pollard and Sag 1992) or logophors (Sells 1987, Reinhart and Reuland 1991).

The latter term was influenced by studies of West African languages, where distinct logophoric pronouns are used when a speaker refers to themself in the context of reported speech (Hagége 1974, Clements 1975). Following insights from this literature, various authors began treating reference to the source of speech or thought on a par with coreference between

overt NPs (See Maling 1984 for Icelandic, Kuno 1987, Sells 1987, Zribi-Hertz 1989, Reuland 2001, König & Gast 2002, Huang 2005 for English; Charnavel & Sportiche 2016 for French; Kuroda 1973, Oshima 2004 for Japanese; Huang & Liu 2001 for Mandarin; Major & Özkan 2017 for Turkish). This allowed to construct the rules that license such reflexives as locality constraints, with the source functioning as a local antecedent for pronominal licesning.

An early attempt at this idea was made by Ross (1970), who suggested that declarative sentences contain a covert speech act '*I'm telling you ...*' above the overt content. According to Ross, this accounts for the licensing of reflexives referring to the speaker or the addressee, and explains the relative acceptability of non-local reflexives in the first and second person, demonstrated in (26).

(26)   *Person effects on anaphoric licensing (Ross 1970: 28-30):*
    (a)   As for {me/myself}, I will not be invited.
    (b)   As for {her/*herself}, she will not be invited.
    (c) $Glinda_1$ said that, as for {her_1/$herself_1$}, she will not be invited.

Cantrall (1974) suggested a more functional implementation of the same idea, where the world knowledge of the speaker is represented by a grammatical primitive "viewpoint" at the left periphery of the clause. Changes in viewpoint were recruited to explain alternations between reflexives and pronouns in the case of deictic perspective, as in (27).

(27)   *Deictic effects on SPA licensing (Cantrall 1974: 16a):*
    (a) $They_1$ placed their guns, as they looked at it, in front of {*$them_1$/$themselves_1$}.
    (b) $They_1$ placed their guns, as I looked at it, in front of {$them_1$/*$themselves_1$}.

Another grammatical representation of deictic perspective is suggested by Svenonius (2006) and Rooryck and Vanden Wyngaerd (2007, 2011), who posed Axial Part as part of the functional hierarchy of the PP. AxPart encodes the different regions around an entity (in English: *front*, *back*, *top*, *bottom*). In this analysis, a covert AxPart projection is responsible for binding effects in SPAs, as it may refer to the entity in the spatial relation or to the speaker/observer, as shown in in (28).[4]

---

[4] Rooryck and Vanden Wyngaerd (2011) derive locality constraints from restrictions on the mechanism of Agree.

(28) *Alternations in AxPart binding (Rooryck and Vanden Wyngaerd 2007: 54):*

Mary$_1$ kept her childhood dolls close to {her$_1$/herself$_1$}.

(a) *Subject-centered interpretation:*

[$_{IP}$ Mary$_1$ kept her dolls [$_{Place}$ close [$_{AxPart}$ Ø$_1$ [$_K$ to [$_D$ herself$_1$

(b) *Observer-centered interpretation:*

[$_{Evid}$ Speaker$_1$ [$_{IP}$ Mary$_2$ kept her childhood dolls [$_{Place}$ close [$_{AxPart}$ Ø$_1$ [$_K$ to [$_D$ her$_2$

This raises the same issue of over generation as previous analyses: if non-complementarity is triggered by an essential part of the PP, it should be a categorical phenomenon. However, this prediction is countered by spatial contexts where reflexives are obligatory.

3.1 The logophoric binder approach

A more general mechanism that links binding with perspective is introduced by Charnavel and Sportiche (2016) and Charnavel (2019, 2020), who argued that attitude contexts are controlled by covert logophoric pronouns at the phase level. The logophoric pronoun picks up its reference from the discourse, and, in turn, locally-binds reflexive pronouns in its C-Command domain.

These definitions entail the following restrictions on logophoric binding: first, reflexives that are bound by a logophoric pronoun cannot refer to inanimate objects, since they are not established in the discourse as point-of-view holders and are therefore invisible to logophoric pronouns. Charnavel and Sportiche demonstrate this with examples like the following, where a reflexive pronoun is acceptable when it refers to *Marie*, but not when it refers to *La Terre* 'The Earth', despite similar syntactic conditions.

(29) *Animacy alternation in French (Charnavel and Sportiche 2016: 29 and fn 28):*

(a) Marie$_1$ s'inquiète souvent du fait que ses enfants dépendent d'elle$_1$-même.
'Mary is often worried that her children depend on herself.'

(b) La Terre$_1$ est dégradée par les êtres humains même si leur
avenir ne dépend que d'elle$_1$-(*même).
'the earth is degraded by human beings even if their future only depends on it(*self).'

Second, logophoric binding should only license reflexives referring to one entity per spell-out domain, since it should be impossible to adopt the perspective of two different entities

at the same time. The examples in (30) demonstrate that it is indeed impossible to use two different logophoricially-bound reflexives referring to two different entities (Christel and Agnès) in the same phase, although each is acceptable on its own (Charnavel analyzes *son proper* 'her own' as a local reflexive, on a par with *elle-même* 'herself').

(30) *No logophoric binding of multiple entities in the same phase (Charnavel 2019: 56)*

    (a) Christel$_1$ pense qu'Agnès$_2$ a dit que l'avenir de son$_1$ fils dépend à la fois d'elle$_1$-même et de son$_2$ (*proper) fils.
          'Christel$_1$ thinks that Agnès$_1$ said that her$_1$ son's future depends both on herself$_1$ and her$_1$ (*own) son.'

    (b) Christel$_1$ pense qu'Agnès$_2$ a dit que l'avenir de son$_1$ fils dépend à la fois d'elle$_1$-(*même) et de son$_2$ proper fils.
          'Christel$_1$ thinks that Agnès$_1$ said that her$_1$ son's future depends both on her$_1$(*self) and her$_1$ (*own) son.

In (31), Charnavel further shows that using different logophoricially-bound reflexives in separate phases is grammatical, as expected.

(31) *One logophoric binder per phase (Charnavel 2019: 32)*

Joseph pense que [les affreuses photoes de moi-même] sont [de magnifiques portraits de lui-même].

'Joseph thinks that the horrible pictures of myself are magnificent portraits of himself.'

This explains the failure of logophoric binding in Reinhart and Reuland's small clause example in (25b), repeated below as (32). The reflexive *herself* is intended to corefer with Mary, but it appears in another independent phase, where Max, is established as the local logophoric center by virtue of being the subject of a speech verb.

(32) pro$_{log1}$ Lucie$_1$ heard [pro$_{log2}$ Max$_2$ praise her$_1$/*herself$_1$].   (adapted from 25a)

An independent condition on logophoric binding explains its general failure with direct object pronouns. This was one of the main motivations for predicate-based approaches, which showed that long-distance reflexives only occur in embedded contexts, as shown in (33).

(33) *No logophoric binding of direct objects (Ross 1979: p. 228):*

    (a) This paper was written by Ann and myself.

(b)* This paper was written by myself.

Ahn (2014) showed that reflexives in direct object positions are unstressed by default. Following this, Charnavel proposes that logophoric binding is impossible in prosodically weak positions, which she detects via the licensing of French weak pronoun *il* and English reduced *'imself*. The following examples show that a phonetically reduced reflexive is licensed in direct object positions, but not embedded ones.

(34)   *Prosodically weak positions ban logophors:*
    (a)   Sara worried that John accidently burnt {'imself/*herself}.
    (b)   Max boasted that the queen invited Lucie and {*'imself/himself} for tea.

The immediate advantage of this analysis is that it predicts where reflexives and pronouns may or may not be non-complementary, deriving their occurrence via locality constraints, while simultaneously accounting for pragmatic effects. For the current purposes, the most essential contribution of perspective-based views is that they provide means to identify logophoric binding.

3.2 Not all non-complementary reflexives are logophoric

The goal of the current subsection is examining the extent to which the source of perspective affects the choice between a reflexive and a pronoun in spatial contexts. A logophoric analysis of (11), repeated again as (35), would have meant that the sentence that contains a reflexive (35a) has to be pronounced from the perspective of the subject *the men*, while the pronoun variation (35b) expresses a neutral perspective, or someone else's. However, (36a-b) show that both sentences are equally acceptable with another entity as the center of perspective.

(35)   (a)   The men$_1$ cast a smokescreen around themselves$_1$.   (repeated from 13)
    (b)   The men$_1$ found a smokescreen around them$_1$.

(36)   *No effect for perspective shifts:*
    (a)   Mary complained that the men$_1$ cast a smokescreen around themselves$_1$.
    (b)   Mary knew that the men$_1$ found a smokescreen around them$_1$.

Cases of interchangeability can fit into a logophoric account if the reflexive becomes unacceptable when its antecedent is changed into inanimate entities. The data below show that

this is only partially borne out in the case of spatial prepositions, as the reflexive is judged badly with *next to* in (37b), but is actually the preferred form for coreference with *over* in (38b).

(37) *Variable effect for inanimacy (next to vs. over):*

    (a) John$_1$ found a snake next to {him$_1$/himself$_1$}.

    (b) The radar$_1$ detected an aircraft next to {it$_1$/*itself$_1$}.

(38) (a) John$_1$ spilled the gasoline all over {him$_1$/himself$_1$}.

    (b) The engine$_1$ sprayed gasoline all over {*it$_1$/itself$_1$}.

Such examples show that contrasts in SPAs cannot be fully reduced to perspective, regardless of which theory of logophoricity is adopted. This indicates the existence of additional factors that affect SPA licensing, which leads in two possible directions, to be discussed in the following sections.

The first option is searching for further discourse conditions that are involved in pronominal licensing in PPs independently of their syntax (Section 4), while the second resorts back to possible structural contrasts that have not been exhausted by the existing SPA literature (Section 5).

4. Independent discourse conditions

The variable pronominal licensing in spatial PPs contributed to the notion that pronominal distribution is chaotic rather than predictable, which certain views take as indication that syntactic locality is not the organizing principle of pronominal dependencies. Such frameworks conceptualize locality as one of many effects on the competition between pronominal forms, alongside speaker's empathy (Kuno 1987), accessibility in working memory (Ariel 1988, Kemmer 2005), frequency (Kemmer 1993, Haspelmath 2008, Ariel 2008) focus alternatives (C. L. Baker 1995) and micro-semantic parameters of relations in space (Lederer 2013).

The current section presents some of the most influential approaches that took the contrast between reflexives and simple pronouns to encode discourse cues, and shows that controlling for them exposes further and more nuanced degrees of pronominal variation rather than reducing it toward a predictable system.

4.1 Empathy and physical contact

Empathy Theory (Kuno 1972, 1987, 2004) derived the likelihood that a reflexive or a pronoun will be used for coreference out of many competing discourse factors, under the assumption that pronominal elements code different levels of empathy toward the entities they refer to.

In this system, reflexives are not limited to a local interpretation, but rather require "that their referents be targets of the actions or mental states represented by the verb phrase" (1987: p.153). Since empathy cannot be measured, Kuno translated it into different observable scales, including how specific the NP's determiner is, or how well the speaker knows the mentioned entity.

Kuno tailors some of the scales to specific environments, e.g., representational noun (picture noun) anaphors are sensitive to the entities awareness, while spatial P anaphors respond to the spatial setting and the level of physical contact. The following examples demonstrate the effect of physical contact on pronominal licensing: reflexives are reported to force a meaning of direct contact between entities, while the pronouns express a more general location.

(39) *Physical contact effects in English (Kuno 1987:1.1-1.2, Rooryck and Vanden Wyngaerd 2007: 11):*

    (a) $John_1$ put the blanket under him_1.   = general spatial area

    (b) $John_1$ put the blanket under $himself_1$.   = physical contact

(40) (a) $John_1$ hid the book behind him_1.   = general spatial area

    (b) $John_1$ hid the book behind $himself_1$.   = physical contact

(41) (a) $Mary_1$ kept her childhood dolls close to her_1.   = in her proximity

    (b) $Mary_1$ kept her childhood dolls close to $herself_1$.   = close to her body

The existence of this interpretive effect is broadly accepted by speakers, and was recently demonstrated experimentally for English SPAs by Bryant (2021). Yet, it does not account exactly for those contrasts that were left unexplained by principles of syntactic locality and point of view shifts. To illustrate this, note that sentences (11)-(13), repeated again as (42)-(44), show no correlation between physical contact and pronoun selection. Both the pronoun and the reflexive versions of these sentences describe a situation of physical contact, while in (44), there is no contact in both cases.

(42) (a) The men_1 cast a smokescreen around $themselves_1$.   (repeated from 11-13)

    (b) The men$_1$ found a smokescreen around them$_1$.

(43) (a) John$_1$ smeared the oil on himself$_1$.

      (b) John$_1$ ignored the oil on him$_1$.

(44) (a) I aimed it at myself.

      (b) I pushed it away from me.

In Wechsler's examples, repeated below as (45)-(46), physical contact is indeed more strongly indicated by the examples that involve reflexives than in the simple pronoun counterparts, at least in the case of *onto himself* and *beside him* in (46). However, it is less clear whether *to himself* in (45b) expresses more physical contact that *behind him* in (45a).

(45) (a) Bubba$_1$ tossed the beer can behind him$_1$.   (repeated from 15-16)

      (b) Bubba$_1$ tossed the beer can to himself$_1$.

(46) (a) Corporal Crump$_1$ pinned the medal beside him$_1$ (on the wall).

      (b) Corporal Crump$_1$ pinned the medal onto himself$_1$

The preposition *to* supposedly entails a situation of imminent physical contact, yet it can be shown that a reflexive is also the preferred form for coreference with *toward*, which lacks this entailment. More importantly, (47) shows that it is impossible to use a simple pronoun in this context to convey a general locative relation, although the sentence enables this meaning.

(47) Bubba$_1$ tossed the beer can toward {himself$_1$/*him$_1$}.

To conclude, despite the clear relation reported for English reflexive SPAs and physical contact between entities, it is evident that controlling for this property does not reduce the contrasts discussed here. Moreover, the fact that a logophoric binding approach and a theory that centers physical contact leave the same examples unaccounted for gives some indication that the two properties are dependent, which is demonstrated further in Section 5.

4.2 Accessibility and expectedness

Another highly influential implementation of the idea that the opposition between reflexive and pronoun encodes discourse-pragmatic factors is demonstrated in Accessibility Theory (Ariel 1988, 1991, 2001). Ariel suggests that reflexives and pronouns express different degrees in the ease of retrieval of the referent in speakers' memory. Like empathy, this is not measured

directly but through interaction with observable factors: the previous mention of the entity, its general proximity to the speaker, the time it first entered the speaker's memory, etc.

The reflexive is argued to mark a higher accessibility level, either due to short distance from its antecedent or to some kind of discourse prominence. Kemmer (2005) showed in greater detail how the various factors related with accessibility derive both local and non-local occurrences of English -*self* anaphors. This analysis was shown to have predictive power over corpus examples, but cannot explain contrasts that emerge out of context, where previous mentions, familiarity levels and other properties are completely balanced, like the ones seen in (42)-(46).

From a different perspective, typological studies of reflexivity, including Faltz (1977), Kemmer (1993), Comrie (1999), and Haspelmath (2007), have highlighted the factor of speaker expectations for local coreference, noting that reflexive pronouns are more common with predicates that are typically other-directed (e.g., *hit*, *talk with*) than with self-directed predicates (e.g., *wash*, *shave*). In the latter case, speakers across languages tend to avoid complex reflexives and prefer lighter strategies, such as middles, reflexive verbs, or simple reflexives such as French *se*.

Ariel (2008) reaffirms these intuitions in an English corpus study, examining first the frequency at which English predicates occur with coreferential and disjoint objects, and, second, the extent to which these predicates take reflexive pronouns as objects. For example, the verb *hit* had 1 case of subject-object coreference out of 110 occurrences, while *dress* had only 4 cases of disjointness in 60 occurrences. This is perfectly compatible with the fact that *hit* requires a reflexive pronoun for coreference, while *dress* mostly appears as an intransitive verb. Language speakers are hypothesized to pick up on such trends and develop an inference of disjointness in extroverted verbs – a principle suggested on theoretical grounds by Levinson (1987). Thus, overcoming the disjointness inference motivates the use of a morphologically marked pronoun.

The data from objects of spatial prepositions is in this respect unexpected: since such prepositions canonically select locations and not individuals, it is safe to assume that they do not refer back to the subject in the majority of their occurrences in any corpus, and should trivially give rise to a disjointness inference. An expectation-based system should therefore

predict that a reflexive will be preferred to a coreferential pronoun in these contexts, yet Ariel finds a sweeping preference for coreferential pronouns as objects of spatial prepositions.

Ariel's attested SPA examples, quoted in (48), seem to align to locality constrains rather than frequencies. In (48a-b), the two underlined arguments of the preposition (or spatial adverb) are disjoint, and the pronoun expresses coreference with the higher subject. However, in (48c), the preposition is the main predicate, its two arguments are coreferential, the lower of which is a reflexive pronoun, as both the Binding Theory and predicate-based approaches would predict.

(48) *Corpus examples of spatial coreference (Ariel 2008: 36-37, my emphases):*

    (a) He$_1$ felt <u>something</u> near <u>him</u>$_1$.

    (b) Can you$_1$ reach <u>the pepper</u> behind <u>you</u>$_1$.

    (c) <u>You</u>$_1$ were a little behind <u>yourself</u>$_1$.

The system of expectations explains one particular contrast shown above, which goes back to Chomsky (1965): a reflexive is not required for local coreference in cases in which the main predicate is a deictic motion verb that takes a corresponding deictic path preposition, as is the case in (49a). The combination of *push* and *(away) from* generates a self-directed action, while *aim at* is by default other-directed. This explains why only the latter requires a reflexive pronoun to denote a coreferential target.

(49) (a) I pushed it away from me.   (Repeated from 13)

     (b) I aimed it at myself.

Lederer (2013) has further shown that when the verb and the preposition have opposite deixis, a reflexive is once again required, which is in line with the expectation hierarchy proposed by Ariel and earlier typological observations.[5]

(50) *Compatible deictic V+P (Lederer 2013: 4.69):*

    (a) John$_1$ pushed the book away from him$_1$.

---

[5] The acceptability of pronouns in (50) raises questions beyond the scope of the current paper, as they appear to be violation Condition B. For extensive discussions of this question see Safir (2004) and Rooryck and Vanden Wyngaerd. Another set of questions involve the possible equivalence of these constructions to their intransitive versions with the prepositions occurring as particles, and the conditions that license them.

  (i) (a) John pushed away the book.   (Rephrasing of 50a)

      (b) *John pulled toward the book.   (Rephrasing of 50b)

     (b) John$_1$ pulled the book toward him$_1$.

(51) *Opposite deictic V+P (Lederer 2013: 4.70-4.71):*
     (a) John$_1$ pulled the book away from{himself$_1$/??him$_1$}.
     (b) John$_1$ pushed the book toward {himself$_1$/??him$_1$}.

To conclude, discourse cues ranging between perspective, empathy, accessibility and expectation were found relevant to SPA licensing. However, they also seem to have uncovered additional layers of variation rather than reducing it toward a predictable system. The following section shows that the syntactic properties of the PPs themselves can provide the missing information in this respect is.

5. The syntax of space

The previous sections showed that the capacity of discourse-pragmatic theories to predict the acceptance of pronominal dependencies across spatial preposition remained compromised, despite efforts to take increasingly higher resolutions of discourse information into account. The goal of the current chapter is to show that a predictable system of SPA licensing emerges when syntactic parameters are also controlled for.

This approach has roots in Lees and Klima (1963), who claim that PPs that take coreferential pronouns originate in independent clauses. This direction became less desirable over the years due to a number of conflicts: first, there were no independent criteria to determine which PPs are clausal and which are dependent upon antecedents in the main clause. Second, since Hoesktra (1988), all spatial PPs were considered clausal, while alternative analyses determined that none of them are, i.e., neither of these dominant approaches found reasons to think that the syntax of spatial PPs is not categorically consistent. Third and most importantly, the data from spatial PPs was reported to be noisy due to competing effects, particularly those of logophoric binding, to the point that the surface occurrence of reflexive pronouns could not serve as evidence for syntactic locality.

The bottom line of the current section is that Lees and Klima's analysis is accurate in the sense that the preference for pronouns over reflexives in PPs (and vice versa) is indicative of their clausal status. With respect to the data problem, I propose that it can be overcome by looking into reflexive pronouns that cannot be interpreted logophorically.

In what follows, Section 5.1 provides evidence that the Hebrew reflexive *acm-* is non-logophoric, and hence less sensitive to a range of discourse conditions. Section 5.2 presents the division of spatial PPs into arguments and adjuncts, which has so far been shown not to translate into consistent patterns of pronominal licensing. I then show that this resulted from the broad definitions previously used for arguments and adjuncts, which meant that each set consisted of a number of sub-classes with conflicting tendencies: argument PPs include both path and place arguments, only the latter of which are clausal (Section 5.3), while complements of perception verbs were classified as adjuncts, despite being clausal arguments (Section 5.4).

The section concludes by showing that distinguishing spatial PPs according to both their selectional status and lexical meaning produces four syntactic types with predictable, complementary patterns of pronominal licensing.

5.1 Non-logophoric reflexives as structural diagnostics

The Modern Hebrew reflexive pronoun *acm-* is similar to the English *-self* in its distributive properties, i.e., it requires a local antecedent, banned from subject positions and exhibits general complementarity with the simple pronoun. However, there is a set of cases where *acm-* departs from the English counterpart, which closely overlaps the set of environments previously explained by logophoric binding.

The following examples suggest that the discrepancies between the Hebrew and English reflexives are caused by lack of logophoric readings for the former. First, *acm-* can never be used to refer to the speaker or the addressee, if these were not already mentioned.

(52) *Hebrew reflexives – no reference to covert discourse participants*
       (compare with 26):

(a) ha-ma'amar nixtav al-jedej an   ve   al-jadi/ *<u>al-jedej acmi</u>}
     The-paper   written by   A.   and by-me   by   myself
     'This paper was written by Ann and me/*myself.'

(b) fizika'im{ kamoxa/ *<u>kmo   acmexa</u>} hem   matat   el.
     physicists like.you   like   yourself COP   gift.of god
     'Physicists like you/*yourself are a godsend.'

Second, *acm-* cannot be used to convey the mindset of the entity it refers to. In the following examples, only the pronoun is grammatical, regardless of the chosen perspective.

(53) *No long-distance coreference with the perspective center (compare with 27, 29):*

    (a) hem henixu et ha-ekdaxim {lejad-am/ *<u>lejad acmam</u>}.

         they placed ACC the-guns next.to-them next.to themselves

         'They placed the guns next to them/*themselves.'

    (b) miri xošešet še-ha-jeladim šel-a tlujim {ba/ *<u>be-acma</u>}.

         M. worries that-the-children of-hers depend on.her on-herself

         'Miri worried that her children depend on her/*herself.'

Third, when *acm-* is licensed in a simple pronoun position, as is the case for representational nouns (picture-NPs), it is not sensitive to changes in animacy and point of view.

(54) *Hebrew reflexives show no effect of animacy:*

    (a) sara ra'ata tmuna{ šela/ <u>šel acma</u>}.

         S. saw picture of.hers of herself

         'Sara saw a picture of her/herself.'

    (b) ha-radar ziha et ha-hištakfut { šelo/ <u>šel acmo</u>}.

         the-radar identified ACC the-reflection of-it of itself

         'The radar identified its reflection/ the reflection of itself.'

Finally, the Hebrew reflexive is not sensitive to the notion of physical contact, in contrast to the examples quoted above from Kuno, and to Bryant's recent findings for English. In the Hebrew equivalents of (40), given below in (55), only pronouns are acceptable, even if they are intended to describe a situation of physical contact.

(55) *No effect of physical contact (compare with 42):*

    (a) joni$_1$ hestir et ha-sefer { me'axorav$_1$/*<u>me'axorey acmo$_1$</u>}.

         J. hid ACC the.book behind.him behind himself

         'Yoni hid the book behind him/*himself.'

    (b) joni$_1$ sam et ha-smixa { mitaxtav$_1$/ *<u>mitaxat le-acmo$_1$</u>}.

         J. put ACC the.blanket under.him under to.himself

         'Yoni put the blanket under him/*himself.'

    (c) miri$_1$ šamra et ha-ca'acu'im šela karov { ele'a$_1$/*<u>le-acma$_1$</u>}.

         M. kept ACC the.toys hers close to.her to.herself

         'Miri kept her toys close to her/*herself.'

The limited interpretive options of *acm-* therefore restrict the contextual effects on its distribution to the minimum. If the variation across SPAs could be reduced to discourse effects, we would expect Hebrew SPAs to exhibit much less variation than English ones. The following subsections show the contrary; Hebrew spatial anaphors are also variable, only their variability aligns with syntactic rather than discursive factors.

5.2 Basic typology

Works that directly confronted questions of SPA licensing have drawn attention to the division of spatial PPs into arguments and adjuncts, which is determined according to the verb, as seen in (56) (Kuno 1987, Hestvik 1991, Reinhart and Reuland 1993, and Büring 2005).

(56)   (a) Argument PP: Mary left her jacket in the corner shop.
       (b) Adjunct PP*:* Mary met John in the corner shop.

A separate well-known distinction involves the prepositions' lexical semantics, divided between place prepositions, which denote fixed locations, and path prepositions denoting changing locations. This property determines whether a preposition would be acceptable with stative verbs, which exclude paths. This is shown in (57).

(57)   *Stative events as a place/path diagnostic:*
       (a)   The students stayed {next to/behind/in front of/around} the mountains.
       (b)* The students stayed {toward/into/through} the mountains.

Place prepositions can be both arguments and adjuncts, and can therefore merge below or above V, respectively. Evidence for this comes from ambiguous sentences such as (58), where the PP *in the lake* can describe the location of event or a stage in it. Gehrke (2008) analyzes these meanings as reflecting the PP's syntactic position, where a position above V must scope over the entire event, while a lower position may hold at stages. A similar analysis was proposed by Tungseth (2008) for Norwegian PPs.

(58)   Sharon jumped in the lake.   (Gehrke 2008: 5)
       (a)   High PP: Sharon jumped while being in the lake.
       (b)   Low PP: Sharon jumped and (as a result) ended up in the lake.

Given the emphasis that many definitions of syntactic locality place on thematic relations, the status of the PP as an argument should determine its spell-out domain and

possible pronominal dependencies. This was previously shown to be the case with ditransitive verbs like *give* or *sell*, which take P arguments that require a reflexive pronoun for subject coreference (Reinhart and Reuland 1993).

(59) *Binding into PPs in ditransitive verbs:*

The charity donated most of the money to {*it/itself}.

If spatial arguments have the same thematic status as arguments of ditransitive verbs, they are also expected to be part of the verbs' binding domains and require reflexives for coreference. Yet, the cited literature has mostly found that the interchangeability of reflexives and pronouns does not distinguish between arguments and adjuncts. In other words, the occurrence of a pronoun or a reflexive in a PP was found not to be predictable from the PP's selectional status, against theoretical predictions.

Assuming that discourse effects are isolated, I take the fact that neither group converged into a consistent pattern to indicate that they include sub-classes with conflicting tendencies. I propose that these can be detected if both the preposition's semantics and merging site are taken into consideration at the same time, as in Table 1.

	Place	Path
Adjunct	A	?B
Argument	D	C

Table 1: Typology of spatial PPs

An intersection of the prepositions' meaning and their selectional status creates four possible classes, at least three of which are attested in language: place adjuncts and path arguments are the canonical uses of these prepositions, place arguments are mostly known for contexts where the PP describes an object's final location, previously labeled Derived Goals, and path adjuncts are questionably attested with speech verbs and certain perception verbs. Representative examples are given in (60).

(60)

Place adjuncts:	*Path adjuncts:*
to read [next to the window].	to shout [through the window].
Place arguments:	*Path arguments:*
to drop a book [next to the window].	to drop a book [through the window]

The following subsections begin with a comparison of place and path arguments (Section 5.3), and move on to adjunct readings (Section 5.4).

5.3 Path and place arguments

The division into place and path prepositions goes back to Jackendoff (1973), who first proposed the extended projection in (61), where path meanings are built incrementally over place meanings.

(61) *Extended PP (Jackendoff 1973):*

[PATH [PLACE [DP   ]]]

This analysis has been broadly adopted, with additional projections added along the way: spatial modifiers like *500 meters* (Koopman 2000), Axial Parts like *front* and *back* (Svenonius 2006, Rooryck and Vanden Wyngaerd 2007, Vanden Wyngaerd 2019, Matushansky and Zwarts 2019), further decomposition of the path concept (Pantcheva 2011), and a little *p* projection introducing a PP internal subject (Svenonius 2003).

Assuming that the structure of the PP determines its interpretation, Jackendoff's model significantly reduces the role of the lexical meaning of the preposition. Looking into motion constructions such as (62), this seems correct, since a meaning of change of location is formed regardless of whether the head preposition is a path or a place.

(62) *Path and place arguments in motion events:*

Sara throws the ball {toward/ through/ next to/ behind/ in front of} the door.

The incremental PP allows to represent all the prepositions in (62) by the same structure, such that place prepositions contain a silent path with a default meaning 'to', as in (63).

(63) (a) *Path argument:*

[PATH *through* [PLACE [DP *the door*]]]

(b) *Place argument:*

[PATH (*to*) [PLACE *next to* [DP *the door*]]]

However, if path and place arguments were to share both their syntactic position and internal makeup, as (63) suggested, they should have shown similar patterns of pronominal licensing. In reality, English path and place arguments systematically contrast when it comes

to coreferential readings of pronouns. The following examples show that pronouns can only get a coreferential reading when they occur under place prepositions.

(64) (a) *Pronominal licensing in path arguments:*

Kobe Bryant$_1$ throws the ball {to/toward}{*him$_1$/himself$_1$}.

(b) *Pronominal licensing in place arguments:*

Kobe Bryant$_1$ throws the ball {next to/behind/in front of}{him$_1$/himself$_1$}.

The contrast in (64) can be explained by locality constraints if place arguments have smaller binding domains than path arguments. This would mean that the pronoun in (64a) is in the same spell-out domain as the subject, while the pronoun in (64b) is in a separate domain and hence can be coreferential with the subject while respecting Condition B. If this is the correct analysis, than the corresponding reflexives are interpreted through different binding mechanisms: the reflexive in (64a) creates a local dependency with the subject, while the one in (64b) requires a logophoric binder, as shown in (65).

(65) (a) *Binding domain of path arguments:*

[Subject$_1$ … V … *toward* … REFL$_1$]

(b) *Binding domain of place arguments:*

Subject$_1$ … V … [pro$_{log1}$ *next to* … REFL$_1$]

Since logophoric binding is not an option in Hebrew, both types of arguments are expected to exhibit complementarity between the reflexive and the simple pronoun. This is confirmed in (66), which presents the Hebrew equivalents of (64).

(66) *Place and path arguments in Hebrew:*

(b) brajent$_1$ zorek   et   ha-kadur {el/le'ever{*-o$_1$/ acmo$_1$}}.

B.   throws ACC the-ball   to/toward   him himself

'Bryant throws the ball to/toward *him/himself.'

(a) brajent $_1$ zorek   et ha-kadur { lejad/   lifne/   meaxore -{o$_1$/*acmo$_1$}}.

B.   throws ACC the-ball   next.to in.front.of behind   him himself

'Bryant throws the ball next to/in front of/behind him/*himself.'

The data from both English and Hebrew therefore points in the same direction, which can be summarized by the generalization in (67).

(67) *The path/place generalization:*

In argument positions, place prepositions define independent binding domains, while path prepositions are part of the domain of the selecting predicate.

This explains some of the contrasts that remained a challenge since the early literature on English pronominalization. In Lees and Klima's examples, repeated below as (68)-(69), a reflexive occurs when the verbs (*cast*, *smear*) denote motion events that select a path argument, and a pronoun is used with stative verbs (*find*, *ignore*) that block path readings of these prepositions.

(68) (a) The men$_1$ cast a smokescreen around themselves$_1$.   (Repeated from 11)

(b) The men$_1$ found a smokescreen around them$_1$.

(69) (a) John$_1$ smeared the oil on himself$_1$.   (Repeated from 12)

(b) John$_1$ ignored the oil on him$_1$.

The same account explains Wechsler's contrasts, where the verb stays fixed while the PP shifts between place and path prepositions. This results in an alternation from the simple pronoun to the reflexive, as predicted from (67).

(70) (a) Bubba$_1$ tossed the beer can behind him$_1$.   (Repeated from 15)

(b) Bubba$_1$ tossed the beer can to himself$_1$.

Table 2 shows that most Hebrew prepositions fall into the expected pattern, and yet there is also a small number of prepositions for which speakers accept both a reflexive and a pronoun with a coreferential meaning. Sentence (71) illustrates this with *me'al* 'above, over'.

	Meaning	Reflexive	Pronoun
(a) *el* 'to'	Path	✓	*
(b) *le-kivun, le'ever* 'toward'	Path	✓	*
(c) *me'al* 'above, over'	Place	✓	✓
(d) *mitaxat* 'under'	Place	✓	✓
(e) (*mi*)*sviv* 'around'	Place	✓	✓
(f) *lifne* 'in front of'	Place	*	✓
(g) *me'axore* 'behind'	Place	*	✓
(h) *leyad* 'next to'	Place	*	✓
(i) *mul* 'in front of'	Place	*	✓

Table 2: Licensing of coreferential SPAs in Hebrew motion events

(71) *Non-complementarity in Hebrew SPAs:*

brajent$_1$ zorek et   ha-kadur {me'al-av$_1$/me'al acmo$_1$}.

B.   throws ACC the-ball   over-him over   himself

'Bryant throws the ball over him/himself.'

The existence of such cases could have meant that a logophoric interpretation of *acm-* is emerging in the language. However, theories of logophoric binding have shown that such dependencies require specific discourse conditions, i.e., that the antecedent would be animate and the source of the information. The following data show first that the licensing of the reflexive in these contexts is not affected by changes in the local attitude holder, but rather remains stable per lexical preposition (72), and second, that this pattern persists in inanimate contexts, where the antecedent has no independent perspective (73).

(72) *No effect for attitude alternations:*

(a) brajent zarak et   ha-kadur{el/ me'al/ le'ever/ sviv *lejad/ *mul}   acmo$_1$.

B.   threw ACC the-ball   to above toward around next.to in.front.of himself

'Bryant threw the ball to/above/toward/ around/*next to/*in front of himself.'

(b) ha-ohadim ka'asu še- brajent$_1$ zarak et   ha-kadur{el/ me'al/ le'ever/ sviv

the-fans   raged that-B.   threw ACC the-ball   to above toward around

*mul/   *lejad} acmo$_1$.

in.front.of next.to himself

'The fans raged that Bryant threw the ball to/above/toward/*next to/*in front of himself.'

(73) *No effect for inanimacy:*

ha-mamtera   hetiza   ma'jim {me'al/ le'ever/sviv *lejad/ *mul}   acma$_1$.

The-sprinkler sprayed water   above toward around next.to in.front.of herself

'The sprinkler sprayed water above/toward/ around/*next to/*in front of itself.'

I propose that non-complementarity in Hebrew SPAs follows from a path-place ambiguity of the prepositions: *me'al* can denote a function from an object to a general location above it, but also a path that goes through this area. *mitaxat* can describe the location under an object and a pathway under it, and *(mi)sviv* describes the area around an object and a path that circles it. Figure 1 illustrates the two meanings of each preposition.
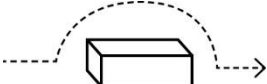
	me'al 'above, over'	*mitaxat* 'under'	*(mi)sviv* 'around'
Place			
Path			

Figure 1: Graphic illustrations of the path and place readings of *me'al*, *mitaxat*, *(mi)sviv*

This ambiguity is separate from the one triggered by different merging sites of the PP, as evident in contexts that accommodate both, such as (74). The PP has three possible readings in such cases: a fixed location, a path and a final location.

(74) *Lexical and syntactic ambiguity in spatial PPs:*

mici gilgela et ha-kadur mitaxat la-sapa.

M. rolled ACC the-ball under the-couch

'Mitzi rolled the ball under the couch.'

Meaning A: The entire event occurred under the couch. (fixed place)

Meaning B: The ball rolled under the couch to the other side. (path)

Meaning C: The ball rolled and ended up under the couch. (derived goal)

The interchangeability that these prepositions show in pronominal licensing is therefore only apparent: the choice between a reflexive and a simple pronoun generates slightly different scenarios, as illustrated below for *me'al*. I return to ambiguous prepositions in section 6.3, to show that complementarity is restored when one of the meanings is canceled.

me'al-av   *me'al acmo*
'above him'   'above himself'
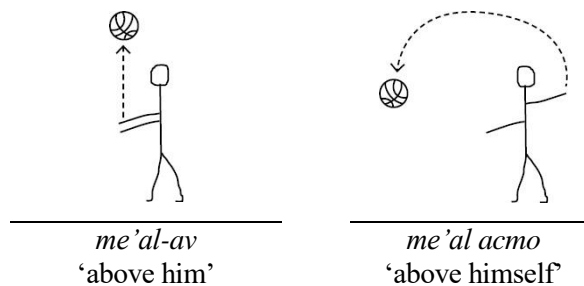
The picture emerging from the Hebrew data suggests that the variability in English can be explained in a similar fashion: distinguishing between path and place arguments while

controlling for logophoricity makes much of the data predictable and complementary, excepting animate place arguments in English. Table 3 summarizes the observed patterns of pronominal licensing according to argument type.

Argument	[+ animate]	[– animate]
Direct Object	*sara$_1$ ra'ata {*ota$_1$/et acma$_1$}.* *Sara$_1$ saw {*her$_1$/herself$_1$}.*	*ha-radar ziha$_1$ {*oto$_1$ /et acmo$_1$}.* *The radar$_1$ detected {*it$_1$/itself$_1$}.*
Indirect Object	*sara$_1$ šalxa {*la$_1$/le-acma$_1$} mixtav.* *Sara$_1$ sent a letter to {*her$_1$/herself$_1$}.*	*ha-radar$_1$ šalax {*lo$_1$/le-acmo$_1$} otot.* *The radar$_1$ sent signals to {*it$_1$/itself$_1$}.*
Path	*sara$_1$ zoreket et ha-kadur le-kivun {*-a$_1$/acma$_1$}.* *Sara$_1$ throws the ball toward {*her$_1$/herself$_1$}.*	*ha-mamtera$_1$ hetiza majim le-kivun{*-a$_1$/acma$_1$}.* *The sprinkler$_1$ sprayed water toward {*it$_1$/itself$_1$}..*
Place	*sara$_1$ zoreket et hakadur lejad {-a$_1$/*acma$_1$}.* *Sara$_1$ throws the ball next to {**her$_1$/herself$_1$**}.*	*ha-sfina$_1$ parsa rešatot lejad {-a$_1$/*acma$_1$}.* *The ship$_1$ laid fishnets next to {it$_1$/*itself$_1$}.*

Table 3: Pronominal licensing in verbal arguments according to animacy and argument type. The Hebrew and English sentences appearing in the first and second line in each cell (respectively) are close equivalents

5.4 High and low places

The previous section argued that place prepositions form independent spell-out domains in argument positions, which raises the question of whether they do the same when they surface as adjuncts. Previous literature (e.g., Hestvik 1991, Reinhart and Reuland 1993) argued that this is at least partially so, as adjuncts were often shown to admit coreferential readings of pronouns, as in the following examples.

(75) *PPs that were previously taken to represent adjuncts:*

    (a) Max$_1$ saw a gun near him$_1$.   (Reinhart and Reuland 1993: 7a)

    (b) John$_1$ heard a strange noise behind him$_1$.   (Büring 2005: 3.30c)

    (c) John$_1$ found a dollar bill in front of him$_1$.   (Hestvik 1991: 14a)

I argue that these data cannot represent pronominal licensing in adjunct PPs because they are ambiguous between an adjunct and an argument reading of the PP. The high-low ambiguity discussed, among others, by Gehrke (2007), was demonstrated extensively for motion events, but motion is not a necessary condition in this respect. Crucially, a similar

structural ambiguity is attested with perception verbs, whose possible complements are divided between DPs (76a) and embedded clauses, including small clause complements (76b).

(76) *Complements of perception verbs:*

    (a) Sara saw John.   (DP complement)

    (b) Sara saw [John laughing].   (Small clause complement)

These configurations therefore provide two possible syntactic positions for place PPs, i.e., above or below the verb. In the latter case, the PP would form a small clause with the object of perception, and therefore be analyzed as a clausal complement, and not as an adjunct. The following examples show that the two readings are indeed attested: one where the PP takes scope over both the subject and the object, and one where it only describes the location of the perceived state.

(77) Sara saw John next to the station.

    (a) High PP: Sara saw John while being next to the station.

    (b) Low PP: Only John is next to the station.

(78) John {saw/heard/noticed} a snake behind the fence.

    (a) High PP: Both John and snake are behind the fence.

    (b) Low PP*:* The snake is behind the fence.

In a locality-based system, the small clause reading is expected to allow coreferential pronouns inside the PP, as seen for derived goals. Finding out which pronominal dependencies are licensed in the adjunct reading therefore requires to examine verbs that cannot take small-clause complements, like *sit* or *read*. The following sentence shows that a place PP that modifies *read* is forced to describe the location of the entire event.

(79) Sara read a book behind the fence.

    (a) High PP: Sara read while being behind the fence.

    (b) Low PP: *only the book was behind the fence.

A meaning where Sara reads a book which is across the fence from her is not accessible in (79), even if the context requires it (e.g., in a scenario where Sara uses binoculars to read over the fence). This reading of the PP does not become accessible when the object is replaced with something easier to read from a distance: in (80a), the only way to get a reading where Sara and the sign are not on the same side of the fence is via a reduced relative reading akin to (80b).

(80) (a) Sara read the sign behind the fence.

(b) [the sign that was behind the fence].

This goes to show that the lack of a lower interpretation of the PP in this case is not a matter of context, but of the range of meanings enabled by the syntax. The following examples show that PPs that are restricted to adjunct readings (81b, 82b) contrast with those occurring with perception verbs (81a, 82a) in that they consistently block coreferential readings of pronouns. In fact, adjunct PPs cannot contain any expression of coreference in most contexts, since a reflexive pronoun will lead to the contradiction that an object is being located with respect to itself.

(81) *Pronominal licensing in place PPs – objects of perception vs. true adjuncts:*

(a) Sara saw a book next to {her$_1$/herself$_1$}.

(b)* Sara$_1$ read a book next to {her$_1$/herself$_1$}.

(82) (a) sara$_1$ ra'ata sefer { lejad-a$_1$/ *lejad acma$_1$}.

S. saw book next.to-her next.to herself

'Sara saw a book next to her.'

(b)* sara$_1$ kar'a sefer { lejad-a$_1$/ *lejad acma$_1$}.

S. read book next.to-her next.to herself

'*Sara read a book next to her.'

The semantic ban on reflexive locative relations may cast some doubt on the informativity of examples like (81b) and (82b) in terms of syntactic locality. It is, however, evidence that metaphorical uses of these PPs do license local reflexives, suggesting that the adjunct falls in the verb's binding domain.[6]

(83) *Local binding into adjunct PPs:*

(a) Stand behind yourself: An embodied experiential to fortify inner support and resilience   (Title by 'The Embodied Podcast', episode 104)

---

[6] I ignore clear proxy readings of reflexive pronouns as in (i), where a distinct entity is involved in the anaphoric relation as a proxy of the antecedent (cf. Jackendoff 1992, Reuland and Winter 2009, Sportiche 2014).

(i) *Context: The owner of the celebrity cat Tardar Soucse (Grumpy Cat) took her to see her model at the wax museum.*
ha-xatul$_1$ jošev lejad acmo$_1$.
the-cat sits next.to himself
'The cat sits next to itself.'

(b) efo   še-ani omedet lejad   acmi…

    where that-I   stand   next.to myself

    'Where I'm standing next to myself'   (*livroax mi-xalom* 'escaping a dream' by Motti Pearlman)

The final class of spatial PPs left to discuss is that of path PPs in adjunct positions. It is questionable whether such a class is in fact attested, since path prepositions typically require licensing. Yet there are environments where path PPs surface without being thematically related to a nearby predicate, such as that of speech verbs and certain perception verbs, demonstrated below.

(84) *Path adjuncts?*

    (a) Sara shouted {toward/from/through/into} the hallway.

    (b) Sara heard John {from/through} the hallway.

Classical adjunct diagnostics, like exclusion from VP ellipsis, seem to point toward an adjunct analysis, at least for (84a).

(85) Sara shouted the dog's name through the window and John did so from the roof.

It is not entirely clear from the scope of the PPs in (84) whether they merge below or above V. The path *through the window* seems to hold for the entire event, but it is not obvious whether it applies to the subject. It could be claimed that the agent's voice is a proper part of the agent itself and therefore the path descriptively holds for the entire VP, but an analysis where paths are subcategorized by certain speech verbs is also defensible. The data from pronoun distribution cannot distinguish between these options, since the PP is not expected to start a new spell-out domain in either option. Table 4 summarizes the information discussed throughout this section according to preposition and verb type, including Hebrew examples.

P	V	Example	Scope	Pron.	Refl.
Place	Intransitive	*hi baxta leyad ha-xalon.* 'She cried next to the window.' *hi₁ baxta {*leyada₁/#leyad acma₁}.* 'She cried next to *her/#herself.'	high	*	#
	Transitive	*hi kar'a sefer leyad ha-šulxan.* 'She read a book next to the desk.'	high	*	#

Path		Example			
		hi kar'a sefer {*leyada/#leyad acma}.			
		'She read a book *next to her/herself.'			
	Perception	*hi ra'ata sefer leyad ha-šulxan.*	low	✓	*
		'She saw a book next to the desk.'			
		hi$_1$ ra'ata sefer {leyada$_1$/*leyad acma$_1$}.			
		'She saw a book next to her/*herself.'			
	Motion	*hi zarka sefer leyad ha-šulxan.*	low	✓	*
		'She threw a book next to the desk.'			
		hi$_1$ zarka sefer {leyada$_1$/*leyad acma$_1$}.			
		'She threw a book next to her/*herself.'			
		hi raca leyad ha-baijt.	high	*	#
		'She ran next to the house.'			
		hi$_1$ raca {*leyada$_1$/#leyad acma$_1$}.			
		'She ran next to *her/#herself.'			
Path		*hi hitkofefa lekivun ha-ricpa.*	low	*	✓
		'She bent toward the floor.'			
		hi$_1$ hitkofefa {*lekivuna$_1$/lekivun acma$_1$}.			
		'She bent toward *her/herself.'			
		hi zarka sefer lekivun ha-šulxan.	low	*	✓
		'She threw a book toward the desk.'			
		hi$_1$ zarka sefer {*lekivuna$_1$/lekivun acma$_1$}.			
		'She threw a book toward *her/herself.'			
	Speech	*hi ca'aka lekivun ha-delet.*	?	*	#
		'She shouted toward the door.'			
		hi$_1$ ca'aka {*lekivuna$_1$/#lekivun acma$_1$}.			
		'She shouted toward *her/#herself.'			

Table 4: Pronominal licensing in Hebrew by verb, preposition, and scope of the PP
(* = ungrammatical, # = contradictory)

6. Analysis: Structural variation in spatial PPs

The previous section showed that pronominal licensing in spatial PPs converges into three patterns: place prepositions that surface as arguments express coreference via a simple pronoun, path arguments require a reflexive pronoun, path and place adjuncts cannot express coreference through any form. I propose that each pattern maps onto one of three possible configurations in which a spatial PP may integrate into a sentence, presented in Table 5: direct integration into the VP (examples a-b); adjunction on V (examples (c-d); and a small clause (e-f).

P semantics	P syntax	Verb	Example	Refl.	Pron.
Path	Simple argument	Motion	(a) *x ran toward x*	✓	*
			(b) *x kicked y toward x*	✓	*
	Adjunct	Speech	(c) *x shouted toward x*	#	*
Place		Stative	(d) *x read y behind x*	#	*
	Small clause	Motion	(e) *x kicked y behind x*	*	✓
		Perception	(f) *x heard y behind x*	*	✓

Table 5: Non-logophoric pronominal licensing in spatial PPs (* = ungrammatical, # = contradictory)

I assume Charnavel's version of Condition A in (86), which holds without exception, and identifies the spell-out domain of the phase as the local domain for anaphoric interpretation. I assume that simple pronouns get a disjoint meaning in the same domain, leaving open the question of whether the constraint on pronouns follows from a separate restriction or from competition with the reflexive pronoun (see Kiparsky 2002 for an overview of competition-based approaches to Condition B).

(86) *Condition A (Charnavel and Sportiche 2016 p.30):*
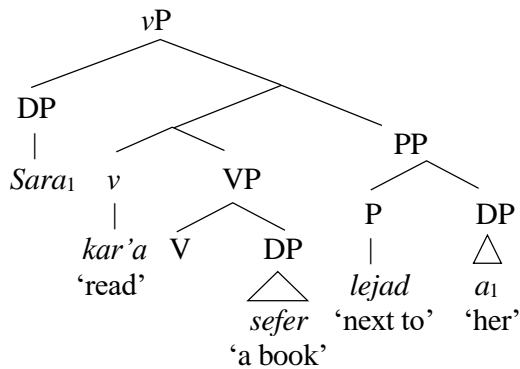   A reflexive anaphor must be interpreted within the spell-out domain containing it.

The distribution of SPAs indicates that place prepositions set up independent spell-out domains when selected by motion or perception verbs. In adjunct position, the same prepositions are part of the VP, as indicated by disjoint pronoun readings. Paths never create new spell-out domains.
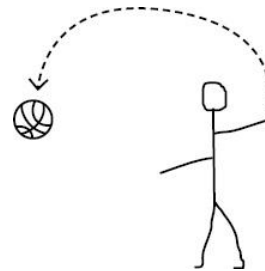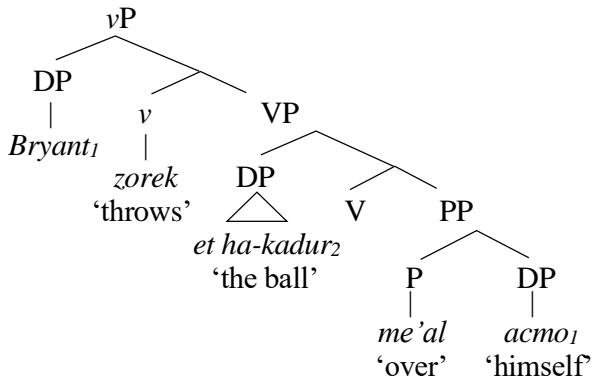
The fact that place PPs form separate phases in a subset of their occurrence supports Svenonius's proposal that prepositional subjects are introduced by a separate head little *p*, equivalent to little *v* in verbs, which introduces the local subject and selects Place as a

complement (Svenonius 2003, 2008, Ramchand and Svenonius 2004, see also Wood and Marantz 2017). In the case of derived goal constructions (89b), I assume that *p* introduces a PRO subject controlled by the direct object of the verb, for reasons outlined in the following subsection. Syntactic representations are given in (87)-(89).
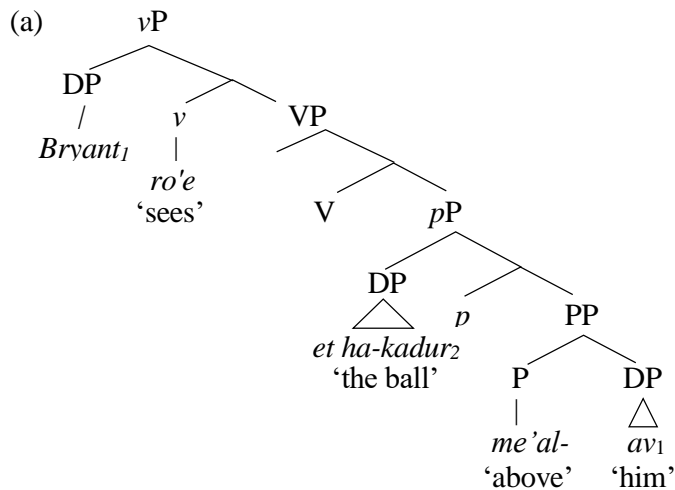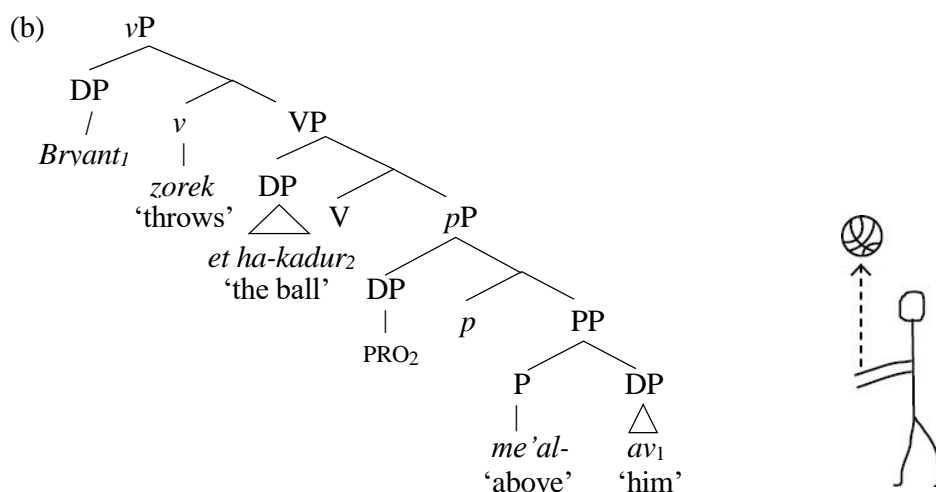
(87) Adjunct:

```
                    vP
           _____|_____
          DP                |
          |          _____|_____
        Sara₁    v              VP          PP
          |    _____|_____    ___|___
        kar'a V        DP    P       DP
        'read'    /\       |       /\
                sefer   lejad     a₁
              'a book' 'next to'  'her'
```

(88) Simple argument:

```
                vP
          _____|_____
         DP            |
         |        _____|_____
      Bryant₁    v          VP
         |    ___|___    ____|____
       zorek DP        V         PP
       'throws' /\          ___|___
          et ha-kadur₂     P       DP
          'the ball'       |       |
                         me'al    acmo₁
                         'over'  'himself'
```

(89) Small clause argument:

(a)
```
                vP
          _____|_____
         DP            |
         /        _____|_____
      Bryant₁    v          VP
         |    ___|___    ____|____
       ro'e           V         pP
       'sees'            ___|____
                       DP        |
                      /\    p        PP
                 et ha-kadur₂     ___|___
                 'the ball'      P       DP
                                 |       /\
                              me'al-    av₁
                              'above'  'him'
```

(b) vP

DP
|
Bryant₁ v VP
|
zorek DP V pP
'throws' |
et ha-kadur₂ DP p PP
'the ball' |
PRO₂ P DP
|
me'al- *av₁*
'above' 'him'

The structure of path arguments is compatible with three different semantic analyses that are indistinguishable in terms of pronoun distribution. The first is the long-standing tradition of complex predication, where the preposition is incorporated into the verb and adds a path to the motion event.[7] Path phrases would then combine with motion verbs through event identification, along the lines of Kratzer (2005), while place prepositions merge as clausal arguments. Another option goes back to Dowty (1979), who proposed that paths are two-place predicates that take V (motion verb) and N (location) as arguments. The third and perhaps more simple analysis is that paths are functional projections that introduce an argument into the VP, similar to datives and applicatives (Pylkkänen 2008, Boneh and Nash 2010, van Dooren, Hendriks, and Matushansky 2014 adopt this analysis for paths).

Certain argument-like behaviors provide evidence against a complex predicate analysis of paths, namely the fact that they require a specific event type and are often obligatory. Both properties are not characteristic of complex predications, in which each of the predicates can usually occur independently. The difference in distribution between paths and classical secondary predicates is illustrated in (90)-(92).

(90) *Path prepositions – limited distribution:*

(a) The students ran {to/toward/through/into} the garden.

(b)* The students are {to/toward/through/into} the garden.

---

[7] A complex predicate analysis of paths may implement the suggestion by Botwinik-Rotem (2003), according to which path prepositions are predicates whose subject is a Davidsonian event argument.

(91) *Secondary predicates – broad distribution:*

    (a) She reached the house out of breath.

    (b) She was out of breath.

(92) (a) She hammered the metal flat.

    (b) The metal is flat.

One could claim that paths are not arguments of the verb, as they are often omitted. However, in this respect path stands on a par with the more canonical arguments, which also vary in their necessity based on contextual factors. This is illustrated in (93)-(94).

(93) *Obligatory arguments:*

    (a) The army destroyed *(the city).   (Direct Object)

    (b) She gave a book *(to her daughter).   (Indirect Object)

    (c) A man threw his daughter *(out the window).   (Path)

(94) *Optional arguments:*

    (a) He refused (the offer).   (Direct Object)

    (b) We sold (our car) (to an American).   (Indirect Object)

    (c) If the QB throws the ball (across the field) and it is swatted back...   (Path)

Paths still exhibit properties that conflict with a functional analysis, namely the fact that they seem to have semantic content in addition to their grammatical function. This is evident in the many different path meanings that are available in language. I leave this question open at this point, and adopt a functional analysis of paths for the sake of simplicity.

6.1 The subject of P

The essence of the current proposal is that a small clause analysis of PPs only holds for derived-goal constructions and for complements of perception verbs. Adopting Hoekstra's (1998) analysis for such PPs places them in a resultative configuration, where the second argument of the verb is not an entity but a result state, as in (95).

(95) *Derived goal as a small-clause resultative:*

Bryant$_1$ throws [$_{PP}$ the ball next to him$_1$].

This raises the question of whether the figure argument should be separated from the matrix clause in the context of perception verbs and derived goals. The current section

demonstrates that this is only correct for perception verbs, and that derived goals seem to realize the figure argument in both the direct object and the P subject position.

Predicate-based binding systems would rule out the idea of excluding the figure argument from the matrix in both cases, based on the possibility of local binding between the matrix subject and the figure, which indicates that they are co-arguments. Example (96a) shows this for derived goal constructions, and example (96b) for complements of perception verbs.

(96)   *Binding into the Figure argument:*

    (a)   brajent $_1$ zarak et   acmo$_1$ lejad   ha-kadur.

          B.   threw ACC himself next.to the-ball

        'Bryant threw himself next to the ball.'

    (a)   brajent $_1$ ra'a et   acmo$_1$ lejad   ha-kadur.

          B.   saw ACC himself next.to the-ball

        'Bryant saw himself next to the ball.'

(97)   (a)   My graphic processor threw itself off a cliff.   (Web example)

    (b)   I saw myself in the picture.

A phase-based approach need not necessarily reach this conclusion, since the figure argument is at the edge of the prepositional phase and could therefore be accessible for operations from the next phase. Assuming that a direct object is also realized is redundant in this respect, pointing toward an Exceptional Case Marking (ECM) configuration, in which the verb assigns case to the subject of an embedded clause. However, this yields another type of redundancy, where every verb that takes place arguments would have to be listed for two different sub-categorization frames.

There is some evidence that an ECM analysis is compatible with perception verbs, while derived goals should get a raising or a control analysis in which the direct object is syntactically realized. One of the hallmarks of ECM configurations is the lack of thematic relations between the verb and the post-verbal DP, which means it can be switched with an expletive subject, as shown in (98)-(99). The following examples show that expletive subjects are available in complements of perception verbs (100), but not with derived goals (101).

(98)   *Expletive subjects in ECM complements (Rothstein 2016: 18):*

    (a)   Mary considers John wrong.

(b) Mary considers it obvious that John is wrong.

(99) (a) I made John repeat his comment.

(b) I made it impossible for John to repeat his comment.

(100) *Expletive subject in perception verb complements:*

We {saw/heard} it raining.

(101) *No expletives in derived goal constructions:*

(a) A man threw his daughter out of the window.

(b)* A man threw it such that his daughter would be out of the window.

The contrast between perception verbs and derived goals also stands out in Hebrew, where perception verbs can take a *ze* pronoun denoting a state of affairs as their sole argument. This speaks to their ability to select for states rather than referential objects.[8] When derived goals take a *ze* pronoun, it may only be interpreted as an entity (compare (102) and (103), respectively).

(102) *Interpretation of ze in perception verbs:*

(a) sara { ra'ata/ šam'a} et   ha-xatul šel-a   nofel me-ha-ec).

S.   saw   heard ACC the-cat of-hers fall from-the-tree

'Sara saw/heard her cat falling off the tree.'

(a) sara { ra'ata/ šam'a} et   ze (še-ha-xatul nafal me-ha-ec).

S.   saw   heard ACC it   that-the-cat fall   from-the-tree

'Sara saw it (the cat falling off the tree).'

(103) *Only referential ze in derived-goal constructions:*

(b) sara { zarka/henixa} et   ha-tik   šel-a   lejad   ha-delet).

S.   threw placed   ACC the-bag of-hers next.to the-door

'Sara threw/placed her bag next to the door.'

(b) sara { zarka/henixa} et   ze (*še-ha-tik   lejad   ha-delet).

S.   threw placed   ACC it   that-the-bag next.to the-door

'Sara threw it (*that the bag is next to the door).'

---

[8] See Borer (1984) and Hazout (1994) for different analyses of *ze* pronouns.

The evidence that a figure argument is represented simultaneously as the matrix object and the preposition's subject can be accounted for via a raising analysis, where the figure forms a chain between the PP's subject and the verb's object position. I avoid this direction since raising operations normally target non-thematic (subject) positions, which is not the case here, though see Postal (1974), Lasnik & Saito (1991) and Runner (2006) for raising to object analysis, and Mateu & Acedo-Matellán's (2012), Bryant (forthcoming), for a raising analysis of spatial PPs. For the reasons stated so far, I adopt an object control analysis for derived goals, where the subject of *p* is a silent PRO argument.[9]

The following subsections support the overall analysis with the following evidence: Section 6.2 presents semantic arguments for the existence of a small clause constituent in PPs headed by place prepositions, and not in those headed by paths. Section 6.3 employs tests of disambiguation to show that non-complementarity in Hebrew SPAs arrives from a path/place ambiguity.

6.2 Evidence from result meanings

In this paper, I proposed to narrowing down the small-clause analysis of PPs from all spatial prepositions to place prepositions in argument positions. The current subsection will show that this is independently supported by the distribution of result meanings, which Hoekstra (1988) posits as the semantic outcome of small-clause constituents. To illustrate, in (104), the result states are *this* being difficult and *him* being off the ship.

(104) *Small-clause results (Hoekstra 1988: 9):*

    (a)   I find [this difficult].

---

[9] Control clauses are known to give rise to the phenomenon of split antecedents (Landau 2013), which is also characteristic of logophoric pronouns (Charnavel 2019): the covert pronoun corefers with more than one DP, and can consequently antecede plural reflexives within the clause, as seen in (i). Derived goals do not enable this option (iia), but this is expected given that causative control clauses generally require full control of the cause (iib). This also indicates that, as Charnavel argues, logophoric pronouns are not inherently available in spatial PPs but rather require an attitude context.

  (i) John$_1$ proposed to Mary$_2$ [PRO$_{1+2}$ to help each other$_{1+2}$].   (Landau 2013: 153b)

  (ii) (a)*John$_1$ caused Mary$_2$ [PRO$_2$ to help each other$_{1+2}$]

      (b)*John$_1$ sat Mary$_2$ [PRO$_2$ next to each other$_{1+2}$].

Certain support arrives from Condition C effects in cases like (103b), where the matrix pronoun *his* is understood as coreferential with the subject of *next to*. If the PP contains a null pronoun co-indexed with *his*, it could explain why coreference with the preposition's object is impossible.

  (iii)(a) [John$_1$'s book] was hardly his$_{1/2}$ first choice.

      (b) [PRO$_1$ next to John$_2$] was hardly his$_{1/*2}$ first choice.

(b) I want [him off my ship].

In the context of spatial PPs, a result is the state of arrival at the named location. The analysis proposed here predicts that such meanings would only be part of the semantics of place prepositions. This is not clear cut, since meanings of arrival may follow from various parts of the sentence, including the preposition, the verb, properties of tense and aspect, and broader context. It is nonetheless predicted that, all else being equal, the meaning of arrival should be harder to cancel in derived goals, compared with path constructions.

A growing amount of evidence seems to point in this direction. First, in a corpus analysis of natural occurrences of *into x* and *in x* in directional contexts, Nikitina (2008) found that *into* tends to "emphasize" the path of motion, while *in* emphasizes the goal of motion.

Second, while the traditional literature on spatial PPs associates the path preposition *to* with a meaning of arrival (Jackendoff 1973, 1987, Piñón 1993, Smith 1997), it is not clear that this meaning component indeed comes from the path phrase. Rappaport Hovav (2008) showed that this entailment depends, among other factors, on event-structure properties of the verb, and more specifically, on the notion of homomorphism between sub-events defined in Krifka (1999). Verbs denoting complex events where the two sub-events are temporally separate, like *throw*, *send* and *launch*, do not yield an entailment of arrival in the final location when combined with path PPs, as shown in (105).

(105) *No result entailment in non-homomorphic caused-motion events*
  (Rappaport Hovav 2008 p.29):
  (a) I threw the ball to Mary (but aimed badly and she didn't catch it).
  (b) We launched the rocket to the moon (but it blew up before it got there).

Bruening (2018) shows that depictive predicates that join path constructions can only access the path, and not the result state. Consequently, it is possible to negate the state of affairs in which an adjective like *wet* in (106a) holds at the state of arrival. The same is not true for a derived-goal configuration headed by the place preposition *in* (106b).

(106) *Modification of result state in Path and Place Ps (adapted from Bruening 2018: 13):*
  (a) Albert walked to the flat wet but got there dry.
  (b) Albert walked in the flat wet # but got there dry.

In a series of experiments, Martin et al. (2021) further showed that arrival entailments are generally cancellable for English *to*, German *zu* and French *à*. For example, in the context in (107), combining a sentence containing a *to*-phrase with descriptions of delaying events had a significant effect on the level of confidence participants expressed regarding an entailment of arrival.

(107) *No result entailment with to (Martin et al. 2021: 12):*

Nina is a heavy smoker. At three o'clock in the morning she walked/went to the convenience store on the next street over, but on the way she ran into good friends at the bus stop.

Q: How safely can you conclude that Nina reached the convenience store?

Finally, the following minimal pairs demonstrate that path and derived-goal constructions vary systematically with regard to entailments of arrival. Configurations headed by path prepositions (a sentences) are compatible with a negative continuation, whereas the same configurations headed by place prepositions (b sentences) do not allow negation.

(108) *Result entailment in Paths and Derived Goals:*

    (a) She kicked the ball <u>to</u> his face (but he dodged it).

    (b) She kicked the ball <u>in</u> his face (#but he dodged it).

(109) (a) I threw the book <u>to</u> Mary (but aimed badly and it didn't get there).

      (b) I threw the book <u>next to</u> Mary (#but aimed badly and it didn't get there).

(110) (a) North Korea launched a rocket <u>to</u> Okinawa (but it blew up before it got there).

      (b) North Korea launched a rocket <u>over</u> Okinawa (#but it blew up before it got there).

(111) (a) zarakti   et   ha-sefer <u>la</u>-xacer   ha-axorit aval hu lo hegi'a le-šam.

           threw.1SG ACC the-book to.the-yard the-back but it NEG arrive to-there

           'I threw the book to the backyard but it didn't get there.'

      (b) zarakti   et   ha-sefer <u>ba</u>-xacer   ha-axorit #aval hu lo hegi'a le-šam.

           threw.1SG ACC the-book in.the-yard the-back but it NEG arrive to-there

           'I threw the book in the back yard # but it didn't get there.'

(112) (a) sara yarta <u>la</u>-matara   ve-hexti'a.

           S.   shot to.the-target and-missed

           'Sara shot toward the target and missed.'

(b) sara yarta <u>ba</u>-matara   # ve-hexti'a.

S.   shot   in.the-target   and-missed

'Sara shot the target # and missed.'

The distribution of result meanings across motion events therefore indicates that a two-place relation between the location and the figure argument is generated in place arguments, while path arguments provide spatial information about the figure through co-argumenthood. In the latter case, arrival at the destination may be implied but may also be cancelled, but the same is not possible with place phrases in the same position.

6.3 Evidence from disambiguation

Previous literature tightly correlate interchangeability between pronouns and reflexives with discourse effects (e.g., Kuno 1987, Ariel 1988, Reinhart & Reuland 1993), for two main reasons. First, a reflexive that is used beyond its domain to emphasize its referent's discourse prominence lands in the domain of pronoun coreference, resulting in the two occupying the same position. Second, the gradual nature of discourse effects may encourage the choice of a reflexive over a pronoun only part of the time, leading to the same result. The analysis proposed here points to a third possible trigger for interchangeability in spatial anaphors, which is the ambiguity of the head prepositions. The analysis predicts that, in such cases, disambiguating the preposition should result in either the pronoun or the reflexive becoming unacceptable.

I suggest that this can be done systematically through stacking of multiple PPs, which may give rise to an additive meaning (both PPs describe the location simultenasly) if the prepositions are of the same type. Otherwise, they are understood as reduced relative clauses, as illustrated in (113).

(113) *Multiple PP parsing:*

    (a) I sat in the park in front of the bus station.   [✓PP stacking ✓Reduced relative]

    (b) I walked through the park to the bus station.   [✓PP stacking * Reduced relative]

    (c) I walked to the bus station in front of the park.   [*PP stacking ✓Reduced relative]

With two place phrases, (113a) has an additive meaning where sitting takes place in a location that is both in the park and in front of the station, alongside a reduced relative meaning that corresponds to *the park which is in front of the bus station.* In (113b), the PPs are both paths

and only the stacked meaning is available, since *the park* cannot be modified by a path. However, when the stacked PPs consist of one path and one place, as in (113c), only the reduced relative meaning is available.

Under the proposed analysis, this effect of PP stacking is predicted to reduce interchangeability of SPAs, since it strengthens one of the PP's meaning over the other. Sentence (71) is repeated twice in (114), first with the addition of the Path PP *la-cad ha-šeni* 'to the other side', and then with an added locative PP *ba-avir* 'in the air', which appeals to the path or the place reading of *me'al*, respectively. As expected, this results in a strong preference for the reflexive being strongly preferred in the former case and a pronoun in the latter.

(114) *Disambiguation by stacking:*

    (a)   sara$_1$ zoreket et ha-kadur{??me'ale'a$_1$/ me'al acma$_1$}

           S.   throws ACC the-ball   above.her above herself

           la-cad   ha-šeni   šel ha-migraš.

           to.the-side the-second of the-court

           'Sara throws the ball above ??her/herself to the other side of the court.'

    (b)   sara$_1$ zoreket et ha-kadur ba-avir { me'ale'a$_1$/??me'al acma$_1$}.

           S.   throws ACC the-ball   in.the-air above.her   above herself

           'Sara throws the ball in the air above her/??herself.'

The case of the preposition *al* 'on, at' shows that SPA licensing is a reliable diagnostic for the presence of path readings. Intuitively, *al* is a place preposition describing a location on the surface of an object, which is compatible with the adjunct and small clause meanings in (115). However, it is not clear whether Meaning B may also result from a simple argument configuration where *al* codes a path of motion toward the stage.

(115) *The preposition al 'on, at' – lexical ambiguity:*

    sara zarka agvaniot   al ha-bama.

    S.   threw tomatoes   on the-stage

    'Sara threw tomatoes on/at the stage.'

    Meaning A: Sara threw tomatoes while standing on the stage.   (Locative)

    Meaning B: Sara threw tomatoes in the direction of the stage.   (Derived Goal/ ?Path)

Focusing on the motion reading, the two attested examples in (116) show that both a pronoun and a reflexive may be licensed as the objects of *al*. According to the analysis proposed here, this is indicative of the availability of both derived goal and path readings.

(116) *The preposition al – Anaphoric interchangeability (web examples):*

    (a) hu$_1$ zarak al acmo$_1$ xulca randomalit.

          he   threw on himself shirt random

          'He threw on *him/himself a random shirt.'

    (b) notelet jadajim, sama ale'a   maše'u   kalil ve-jocet.

          washes hands   puts on.her something light and-exits

          '(she) washes her hands, puts something light on her and leaves the house.'

The previous subsection demonstrated the relation between entailed results and place PPs, i.e., that place phrases entail a meaning of arrival in the specified location, while path prepositions may invite this meaning as an inference. If *al* indeed has a path reading, it should be able to accommodate a rejection of the arrival of the entity at the named surface location. Sentence (117) shows that the arrival meaning can indeed be canceled without causing a contradiction.

(117) *The preposition al – no result entailment:*5

    sara zarka agvaniot al ha-saxanim (aval hen lo   pag'u ba-hem).

    S.   threw tomatoes on the-actors   but they NEG hit   in-them

    'Sara threw tomatoes at the actors (but they didn't hit them).'

To conclude, the effect of disambiguation on cases of pronoun-reflexive interchangeability in Hebrew PPs suggests that it indeed follows from the preposition giving rise to both path and place meanings at the same time, rather than the reflexive anaphor being optional due to discourse factors. The pronoun and the reflexive therefore do not occupy the same syntactic position, but rather signal the existence of two different structures under the same linear order.

7. Conclusion

This paper has shown that pronominal licensing across spatial prepositions does not counter locality-based systems of coreference, but rather respects them. The well-known variation in

this domain, which was so far assumed to be under the control of discourse properties, was shown to reveal predictable patterns that respect the general principles of the Binding Theory.

I showed that spatial PPs divide both by their lexical meaning and their syntactic position, and that both types of data are required to predict pronominal licensing in the PP. The combination of place prepositions and argument positions was shown to be the only category that is compatible with a small-clause analysis, both in terms of pronominal licensing and result state meanings.

I showed that other combinations, i.e., path prepositions in argument positions, place prepositions in adjunct positions, do not form opaque binding domains, which indicates that the phasal status of spatial PPs does not arrive from P but from a separate component. I identify this component with the little p head hypothesized by Svenonius (2003 and consecutive work). This points to a consistent syntax, where motion verbs may select for either Path or p, where p selects for Place. I also pointed out that prepositions may be ambiguous between path and place readings, and that this is expressed in the parallel licensing of a reflexive and a pronoun. I showed that such P anaphors resort back to complementarity when one of the meanings is cancelled.

References

Ahn, Byron Thomas. 2014. Giving Reflexivity a Voice: Twin Reflexives in English.

Antonenko, Andrei. 2012. Feature-Based Binding and Phase Theory. PhD dissertation, Stony Brook University.

Ariel, Mira. 1988. Referring and Accessibility. *Journal of Linguistics* 24 (1): 65–87.

———. 1991. The Function of Accessibility in a Theory of Grammar. *Journal of Pragmatics* 16 (5): 443–63.

———. 2001. Accessibility Theory: An Overview. In *Text Representations: Linguistic and Psycholinguistic Aspects*, edited by Ted Sanders, Joost Schilperoord, and Wilbert Spooren. Vol. 8. Amsterdam: John Benjamins Publishing Company.

Baker, Carl L. 1995. Contrast, Discourse Prominence, and Intensification, with Special Reference to Locally Free Reflexives in British English. *Language* 71 (1): 63–101.

Baker, Mark C. 1988. *Incorporation: A Theory of Grammatical Function Changing*. Chicago: University of Chicago Press.

Boneh, Nora, and Léa Nash. 2010. A Higher Applicative: Evidence from French. *Proceedings of Israel Association for Theoretical Linguistics* 25: 1–21.

———. 2017. The Syntax and Semantics of Dative DPs in Russian Ditransitives. *Natural Language & Linguistic Theory* 35 (4): 899–953.

Borer, Hagit. 1984. *Parametric Syntax*. Case Studies in Semitic and Romance Languages. De Gruyter Mouton. https://doi.org/10.1515/9783110808506.

Botwinik-Rotem, Irena. 2003. The Thematic and Syntactic Status of Ps: The Dative, Directional, Locative Distinction. In *Research in Afroasiatic Grammar II*, 79–104. John Benjamins.

Bruening, Benjamin. 2010. Ditransitive Asymmetries and a Theory of Idiom Formation. *Linguistic Inquiry* 41 (4): 519–62.

Bryant, Shannon. 2021. Location, Location, Location: Anaphor Selection in English Locative Prepositional Phrases. In *Proceedings of the Linguistic Society of America*, edited by Farrel, 7:5263. 1.

Büring, Daniel. 2005. *Binding Theory*. Cambridge: Cambridge University Press.

Canac-Marquis, Réjean. 2005. Phases and Binding of Reflexives and Pronouns in English. In *Proceedings of the 12th International Conference on Head-Driven Phrase Structure Grammar*, 482–502. Stanford, CA: CSLI Publications.

Cantrall, W. 1974. Viewpoint, Reflexives, and the Nature of Noun Phrases.

Charnavel, Isabelle, and Dominique Sportiche. 2016. Anaphor Binding: What French Inanimate Anaphors Show. *Linguistic Inquiry* 1742 (1): 35–87. https://doi.org/10.1162/ling_a_00204.

Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.

———. 1986. *Barriers*. Cambridge, MA: MIT press.

———. 2001. Derivation by Phase. In *Ken Hale, a Life in Language*, 1–51. Cambridge, MA: MIT Press.

———. 2008. On Phases. In *Foundational Issues in Linguistic Theory: Essays in Honor of Jean-Roger Vergnaud*, 133–66. Current Studies in Linguistics Series 45. Cambridge, MA: MIT Press.

Citko, Barbara. 2014. *Phase Theory: An Introduction*. Cambridge University Press.

Clements, G N. 1975. The Logophoric Pronoun in Ewe: Its Role in Discourse. *Journal of West African Languages* 10: 141–77.

Comrie, Bernard. 1999. Reference-Tracking: Description and Explanation. *STUF-Language Typology and Universals* 52 (3–4): 335–46.

Déchaine, Rose-Marie, and Martina Wiltschko. 2017. A Formal Typology of Reflexives. *Studia Linguistica* 71 (1–2): 60–106.

Despić, Miloje. 2015. Phases, Reflexives, and Definiteness. *Syntax* 18 (3): 201–34.

Dikken, Marcel den. 2015. Raising the Subject of the 'Object-of' Relation. *MIT Working Papers in Linguistics* 77: 85–98.

Dooren, Annemarie van, Lotte Hendriks, and Ora Matushansky. 2014. Getting Results. Utrecht University.

Dowty, David. 1979. *Word Meaning and Montague Grammar*. Dordrecht: Reidel.

Faltz, Leonard M. 1977. Reflexivization: A Study in Universal Syntax. PhD dissertation, Universiy of California-Berkeley.

Folli, Raffaella, and Heidi Harley. 2006. On the Licensing of Causatives of Directed Motion: Waltzing Matilda All Over. *Studia Linguistica* 60 (2): 121–55.

Folli, Raffaella, and Gillian Ramchand. 2005. Prepositions and Results in Italian and English: An Analysis from Event Decomposition. In *Perspectives on Aspect*, 81–105. Dordrecht: Springer.

Gehrke, Berit. 2008. *Ps in Motion*.

Hagége, C. 1974. Les Pronoms Logophoriques. *Bulletin de La Sociéteé de Linguistique de Paris* 69: 287–310.

Haspelmath, Martin. 2007. A Frequentist Explanation of Some Universals of Reflexive Marking. *Linguistic Discovery* 6 (1): 40–63.

Hazout, Ilan. 1994. The Hebrew Pronoun Ze and the Syntax of Sentential Subjects. *Lingua* 93 (4): 265–82. https://doi.org/10.1016/0024-3841(94)90359-X.

Hestvik, Arild. 1991. Subjectless Binding Domains. *Natural Language & Linguistic Theory* 9 (3): 455–96.

Jackendoff, Ray. 1973. The Base Rules for Prepositional Phrases. In *Festschrift for Morris Halle*, edited by Stephen Anderson and Kiparsky Paul, 345–56. NY: Holt, Rinehart and Winston.

———. 1987. The Status of Thematic Relations in Linguistic Theory. *Linguistic Inquiry* 18 (3): 369–411.

———. 1992. Mme. Tussaud Meets the Binding Theory. *Natural Language & Linguistic Theory* 10 (1): 1–31.

Kemmer, Suzanne. 1993. *The Middle Voice*. Vol. 23. Typological Studies in Language. Amsterdam: John Benjamins Publishing Company.

Kiparsky, Paul. 2002. Disjoint Reference and the Typology of Pronouns. *More than Words* 53: 179–226.

Koopman, Hilda. 2000. Prepositions, Postpositions, Circumpositions, and Particles. In *The Syntax of Specifiers and Heads*, edited by Hilda Koopman, 204–60. London: Routledge.

Kratzer, Angelika. 2005. Building Resultatives. In *Event Arguments: Foundations and Applications*, edited by Maienborn Claudia and Angelika Wöllstein, 177–212. Tübingen: Max Niemeyer Verlag.

Krifka, Manfred. 1999. Manner in Dative Alternation. In , 18:260–71. Somerville, SA: Cascadilla Press.

Kuno, Susumu. 1972. Pronominalization, Reflexivization and Direct Discourse. *Linguistic Inquiry* 3: 161–95.

———. 1987. *Functional Syntax: Anaphora, Discourse and Empathy*. Chicago: University of Chicago Press.

———. 2004. Empathy and Direct Discourse Perspectives. *The Handbook of Pragmatics*, 315–315.

Landau, Idan. 2013. *Control in Generative Grammar: A Research Companion*. Cambridge University Press.

Langacker, Ronald W. 1966. *On Pronominalization and the Chain of Command*. University of California.

Lasnik, Howard, and Mamoru Saito. 1991. On the Subject of Infinitives. *Procceedings of the Chicago Linguistic Society (CLS) 27*, 324–43.

Lederer, Jenny. 2013. Understanding the Self: How Spatial Parameters Influence the Distribution of Anaphora within Prepositional Phrases. *Cognitive Linguistics* 24 (3): 483–529.

Lees, R. B., and E. S. Klima. 1963. Rules for English Pronominalization. *Language* 39 (1): 17–28. https://doi.org/10.2307/410759.

Lee-Schoenfeld, Vera. 2004. Binding by Phase:(Non-) Complementarity in German. *Journal of Germanic Linguistics* 16 (2): 111–71.

Legate, Julie Anne. 2003. Some Interface Properties of the Phase. *Linguistic Inquiry* 34 (3): 506–16.

Levinson, Stephen C. 1987. Pragmatics and the Grammar of Anaphora: A Partial Pragmatic Reduction of Binding and Control Phenomena1. *Journal of Linguistics* 23 (2): 379–434.

Maddox, Matthew L. 2021. The Development of SE from Latin to Spanish and the Reflexive Object Cycle. In *Unraveling the Complexity of SE*, 33–56. Springer.

Martin, Fabienne, Margaret Grant, Christopher Piñón, and Florian Schäfer. 2021. A New Case of Low Modality: Goal PPs. In *Proceedings of Semantics and Linguistic Theory*, edited by Joseph Rhyne, Kaelyn Lamp, Nicole Dreier, and Chloe Kwon, 30:562–82. Washington, DC: Linguistic Society of America.

Mateu, Jaume, and Víctor Acedo-Matellán. 2012. The Manner/Result Complementarity Revisited: A Syntactic Approach. In *The End of Argument Structure*, 209–28. Brill.

Matushansky, Ora, and Joost Zwarts. 2019. Tops and Bottoms: Axial Nominals as Weak Definites. In *Proceedings of the 36th West Coast Conference on Formal Linguistics*, edited by Richard Stockwell, Maura O'Leary, Zhongshi Xu, and Z.L. Zhou, 270–80. Somerville, MA: Cascadilla Proceedings Project.

Neeleman, Ad. 1994. Complex Predicates. PhD dissertation, Utrecht University.

Nikitina, Tatiana. 2008. Pragmatic Factors and Variation in the Expression of Spatial Goals. In *Syntax and Semantics of Spatial P*, edited by Anna Asbury, Berit Gehrke, and Rick Nouwen, 175–95. Linguistik Aktuell 120. Amsterdam: John Benjamins Publishing Company.

Pantcheva, Marina Blagoeva. 2011. Decomposing Path: The Nanosyntax of Directional Expressions. PhD dissertation, University of Tromsø.

Piñón, Christopher J. 1993. Paths and Their Names. In *Papers from the 29th Regional Meeting of the Chicago Linguistic Society*, edited by Katharine Beals, Gina Cooke, David Kathman, Sotaro Kita, Karl-Erik McCullough, and David Testen, 2:287–303. Chicago, IL: Chicago Linguistics Society.

Pollard, Carl, and Ivan A Sag. 1992. Anaphors in English and the Scope of Binding Theory ∗, 1–47.

Postal, Paul. 1974. *On Raising: One Rule of English Grammar and Its Theoretical Implications*. Cambridge, MA: MIT Press.

Pylkkänen, Liina. 2008. Introducing Arguments. *Linguistic Inquiry*, Linguistic inquiry monographs 49, .

Quicoli, Carlos A. 2008. Anaphora by Phase. *Syntax* 11 (3): 299–329.

Ramchand, Gillian. 2008. *Verb Meaning and the Lexicon: A First-Phase Syntax*. Cambridge, MA: Cambridge University Press.

Ramchand, Gillian, and Peter Svenonius. 2004. Prepositions and External Argument Demotion. *Demoting the Agent: Passive and Other Voice-Related Phenomena*, 93–99.

Rappaport Hovav, Malka, and Susan Rothstein. 2008. Lexicalized Meaning and the Internal. In *Theoretical and Crosslinguistic Approaches to the Semantics of Aspect*, 13–42. Linguistik Aktuell 110. Amsterdam: John Benjamins Publishing Company.

Reinhart, Tanya M. 1976. The Syntactic Domain of Anaphora.

———. 1983. *Anaphora and Semantic Interpretation*. Taylor & Francis.

Reinhart, Tanya M., and Eric Reuland. 1991. Anaphoric Territories. *GAGL: Groninger Arbeiten Zur Germanistischen Linguistik*, no. 34: 155–99.

———. 1993. Reflexivity. *Linguistic Inquiry* 24 (1993): 657–720.

Reuland, Eric, and Yoad Winter. 2009. Binding without Identity: Towards a Unified Semantics for Bound and Exempt Anaphors. In *Anaphora Processing and Applications*, edited by Sobha Lalitha Devi, António Branco, and Ruslan Mitkov, 5847:69–79. DAARC 2009. Lecture Notes in Computer Science. Berlin, Heidelberg: Springer.

Rooryck, Johan, and Guido Vanden Wyngaerd. 2007. The Syntax of Spatial Anaphora. *Nordlyd* 34: 2–2.

———. 2011. *Dissolving Binding Theory*. Oxford University Press.

Rothstein, Susan. 2006. Secondary Predication. *The Blackwell Companion to Syntax*, 209–33.

———. 2012. *Predicates and Their Subjects*. Vol. 74. Springer Science & Business Media.

———. 2013. *Secondary Predication and Aspectual Structure*. Universitätsbibliothek Johann Christian Senckenberg.

Runner, Jeffrey T. 2006. Lingering Challenges to the Raising-to-object and Object-control Constructions. *Syntax* 9 (2): 193–213.

Safir, K J. 2004. *The Syntax of Anaphora*. Oxford: Oxford university press.

Sells, Peter. 1987. Aspects of Logophoricity. *Linguistic Inquiry* 18 (3): 445–79.

Siloni, Tal. forthcoming. Two Types of Se Reflexive and Reciprocal Verbs.

Smith, Carlota S. 1991. *The Parameter of Aspect*. Vol. 43. Studies in Linguistics and Phylosophy. Dordrecht: Springer Science & Business Media.

Sportiche, Dominique. 2014. Assessing Unaccusativity and Reflexivity: Using Focus Alternatives to Decide What Gets Which θ-Role. *Linguistic Inquiry* 45 (2): 305–21.

Svenonius, Peter. 2003. Limits on P: Filling in Holes vs. Falling in Holes. *Proceedings of the 19th Scandinavian Conference of Linguistics,* 31 (1).

———. 2006. The Emergence of Axial Parts. *Nordlyd. Tromsø University Working Papers on Language & Linguistics* 33(2006): 49–77.

———. 2008. Projections of P. In *Syntax and Semantics of Spatial P*, edited by Anna Asbury, Jakub Dotlačil, Berit Gehrke, and Rick Nouwen, 0–16. Linguistik Aktuell 120. Amsterdam: John Benjamins Publishing Company.

Talmy, Leonard. 1976. Semantic Causative Types. In *The Grammar of Causative Constructions*, edited by Masayoshi Shibatani, 43–116. Syntax and Semantics 6. New York, NY: Brill.

Tungseth, Mai Ellin. 2008. Verbal Prepositions and Argument Structure. *Verbal Prepositions and Argument Structure*, 1–200.

Vanden Wyngaerd, Guido. 2019. Locative-Directional Alternations. In *Language Use and Linguistic Structure. Proceedings of the Olomouc Linguistics Colloquium 2018*, edited by Joseph Emonds, Markéta Janebová, and Ludmila Veselovská, 7:117–34. Olomouc Modern Language Series. Olomouc: Palacký University.

Wechsler, Stephen. 1997. Prepositional Phrases from the Twilight Zone. *Nordic Journal of Linguistics* 20 (2): 127–54.

Williams, Edwin. 1980. Predication. *Linguistic Inquiry* 11 (1): 203–38.

Wood, Jim, and Alec Marantz. 2017. The Interpretation of External Arguments. In *The Verbal Domain*, edited by Roberta D'Alessandro, Irene Franco, and Ángel J. Gallego–255 , 78. Oxford: Oxford University Press.

Zribi-Hertz, Anne. 1989. Anaphor Binding and Narrative Point of View: English Reflexive Pronouns in Sentence and Discourse. *Language* 65 (4): 695.