

Locations and binding domains

Prepositions of spatial relations are known to enable free variation of pronouns and reflexive anaphors, which is mostly attributed to discourse factors like point of view, empathy, accessibility and expectation. The current paper shows based on evidence from Modern Hebrew that controlling for pragmatic factors reveals alternations which can be traced back to properties of P. In particular, I show that place prepositions form independent binding domains, in accordance with the hypothesis that spatial PPs project internal subjects, while path prepositions are part of a larger domain defined by the nearest subject beyond the PP. The correspondence between stative locations and binding domains is shown to be determined at the lexical level, regardless of directional meanings that are formed at the level of the PP or the VP. The analysis explains contrasts found in similar contexts in English, as well as predict the distribution of result meanings and the interchangeability of pronouns and anaphors under ambiguous prepositions.

1. Introduction

Complex reflexives like English *-self*, Hebrew *acm-*, Turkish *kendi-* and many others, are known to alternate with simple pronouns in object positions, such that reflexives denote coreference with a local antecedent, while simple pronouns are used for disjoint reference:

- (1) (a) They₁ saw {them_{*1/2}/themselves_{1/*2}} in the mirror.
(b) Sara ra'ata {ota_{*1/2}/ et acma_{1/*2}} ba-mar'a (Hebrew)
S. saw her ACC herself in.the-mirror
(c) Hasan {onu_{*1/2}/ kendini_{1/*2}} aynada gordu. (Turkish, Faltz: 1977: 4)
H. 3SG self.3SG.ACC mirror.LOC saw

It has long been noted, mainly for English, that the complementarity between pronouns and reflexives tends to break when they are embedded under spatial prepositions. In such cases, it is often that both reflexives and pronouns can be used coreferentially, as in (2).

- (2) (a) John₁ saw a snake next to {him₁/himself₁}.
(b) Max₁ rolled the carpet over {him₁/himself₁}. (Reinhart and Reuland 1993: 67)

These observations led to various analyses that take the Binding Condition A, which states the reflexives should be interpreted locally, as irrelevant in spatial PPs (Pollard and Sag

1992, Reinhart and Reuland 1993) or in general (Rooryck and Vanden Wyngaerd 2011). Others conclude that the distribution of reflexives mainly reflects pragmatic conditions like point of view (Cantrall 1974), empathy (Kuno 1987), accessibility (Ariel 1988, Kemmer 2005) and expectedness (Kemmer 1993, Haspelmath 2007, Ariel 2008). Based on evidence from Modern Hebrew, this paper shows that controlling for pragmatic effects reveals a predictable distribution of P anaphors, which corresponds with the properties of the head.

Standard analyses attribute the non-complementarity in (2) to logophoricity, a phenomenon where reflexive pronouns are used beyond their binding domain to code the point of view in the utterance, which places them in the domain of pronoun coreference. In Modern Hebrew, the reflexive form *acm-* is not used as a logophor (Bassel 2018, Angelopoulos and Bassel 2019), which should leave out only pronouns as acceptable in the Hebrew equivalents of the sentences in (2). The data in (3) shows that this is only true in the former case.

(3) (a) *sara₁ ra'ata naxaš {leyad-a₁/ *leyad acma}*.

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/ misaviv le-acma₁}*.

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

‘Sara rolled the carpets over her/herself.’

The licensing of the Hebrew reflexive in (3b) leads to two possible explanations: a discourse-based account, where logophoricity is attested in Hebrew but restricted comparing to English and other languages, and a syntactic account, under which local binding is available in a subset of Hebrew PPs. The goal of the current paper is to show that a syntax-based approach is more compatible with the Hebrew data, and draw implications to the syntax of spatial PPs.

In the following sections I show that the contrasts observed in Hebrew spatial anaphor-licensing do not align with various discourse conditions, but rather with the division suggested by Jackendoff (1973) between prepositions of path and place (*misaviv* ‘around’ vs. *leyad* ‘next to’, respectively). Furthermore, I show that replacing the antecedents in the contexts given above with inanimate entities, following Charnavel and Sportiche (2016), leads to similar judgments in Hebrew and English, as shown in (4)-(5).

(4) (a) The radar₁ detected a plane next to {it₁/*itself₁}.

- (b) The atom nucleus₁ moves the electrons around {it₁/itself₁}.
- (5) (a) ha-radar₁ ziha matos { leyad-o₁/*leyad acmo₁}.
 the-radar identified plane next.to.it next.to itself
 ‘The radar identified a plane next to it/*itself.’
- (b) gar’in₁ ha-atom meni’a et ha-elektronim { misviv-o₁/ misaviv le-acmo₁}.
 nucleus the-atom moves ACC the-electrons around.it around to-itself
 ‘The atom nucleus moves the electrons around it/itself.’

The acceptability of a reflexive anaphor in (5b), comparing to (5a), suggests that the status of spatial prepositions as binding domains divides the category along the Path-Place axis. Since syntactic theories define the domain of binding according to predication (Chomsky 1986; Reinhart and Reuland 1993) or phasehood (Lee-Schoenfeld 2004, Canac-Marquis 2005, Quicoli 2008, Antonenko 2012, Despić 2015, Charnavel and Sportiche 2016), the findings suggest that predicative properties attributed to spatial prepositions can be narrowed down to prepositions that denote stative location.

Further information is required here, since according to many authors (e.g. Svenonius 2006, 2007, Rooryck and Vanden Wyngaerd 2007, Berit Gehrke 2008), the meaning of change of location can be generated at the P level or at higher levels of projections. For example, derived-goal constructions are combinations of motion verbs and place prepositions, where the preposition denotes the final location of a moving entity, and a directional meaning is formed at the VP level. In the following minimal pairs, the path preposition *el* ‘to’ requires a reflexive anaphor for coreference while the place preposition *leyad* ‘next to’ bans it, indicating that the binding domain is determined at the lexical level, and is not affected by directional meanings formed at the level of the PP or the VP.

- (6) (a) sara zarka et ha-kadur {*ele-a/ el acma}
 S. threw ACC the-ball to-her to herself
 ‘Sara threw the ball toward *her/herself.’
- (b) sara zarka et ha-kadur { leyad-a/ *leyad acma}
 S. threw ACC the-ball next.to-her next.to herself
 ‘Sara threw the ball next to her/*herself.’

Among the well-established views on PP syntax, many assume them to (invariantly) contain a small clause projecting a PP internal subject (Hoekstra 1988, Folli and Harley 2006, Ramchand 2008, den Dikken 2010, Mateu and Acedo-Matellán 2012) or a complex predicate which incorporates the PP into the matrix verb (Williams 1980, Baker 1988, Neeleman 1994, Rothstein 2013, den Dikken 2015; Gehrke 2008 takes a combined approach). The binding effects observed here suggest to restrict the small-clause analysis to Place PPs, while Path PPs may either form complex predicates or merge as arguments of motion verbs.

A small-clause approach to Place PPs is justified by two additional factors: First, the fact that the subject of the preposition under this analysis, the moving entity, can bind an anaphor and give rise to a proxy reading, as in (7).

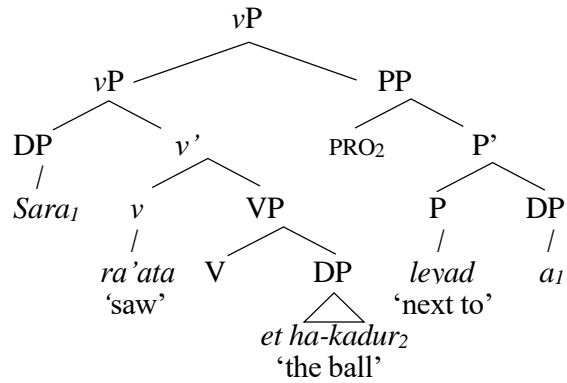
- (7) sara {šamra/henixa}et ha-xatul {*leyad-o/ leyad acmo}.
- S. kept placed ACC the-cat next.to-him next.to himself
 ‘Sara kept/placed the cat next to *it/itself.’

Second, the distribution of result meanings, which are related in the literature with small-clause constituents, also parallels the Path-Place distinction, as entailment tests show that the meaning of arrival at a destination is only coded by place prepositions.

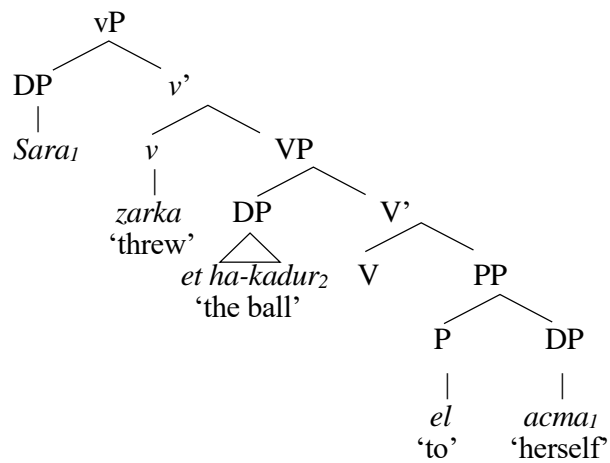
- (8) (a) sara yarta **la**-matara ve-hexti’a.
- S. shot to.the-target and-missed
 ‘Sara shot at the target and missed’
- (b) sara yarta **ba**-matara #ve-hexti’a.
- S. shot to.the-target and-missed
 ‘Sara shot the target # and missed’

The binding facts point to the following possible configurations of spatial PPs: a locative adjunct configuration headed by a place preposition (9), a change-of location construction involving a path preposition in (10), and a derive-goal construction where a place preposition names the final location in (11).

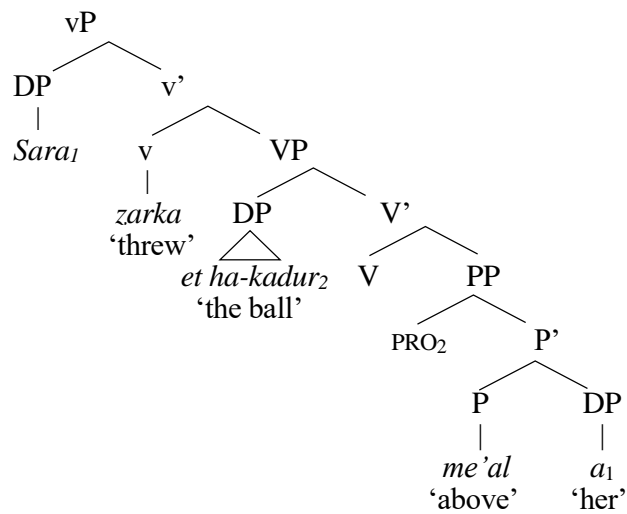
(9) Location (Place P)



(10) Direction (Path P)



(11) Derived goal (Place P)



Finally, I show that the apparent interchangeability between pronouns and anaphors in cases like (3b) is generated when the head preposition itself is ambiguous between path and place meaning, as with the preposition *me'al* 'above, over' in (12). The analysis predicts that strengthening the path reading of the preposition, e.g. via adding a second path phrase, would cancel the coreferential reading of the pronoun, which is the case in (13)

(12) Sara zarka et ha-kadur {me'al-ea/ me'al acma}.

S threw ACC the-ball over-her over herself
'Sara throws the ball over her/herself.'

(13) sara₁ zoreket et ha-kadur {??me'ale'a₁/ me'al acma₁}

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'

The paper is constructed as follows: Section 2 outlines the sensitivity of binding phenomena to discourse conditions, and shows that this does not apply to the set of contrasts discussed here. Section 3 examines the data from the perspective of accessibility and expectations. Section 4 attempts to predict the observed contrasts from theories of PP syntax, and Section 5 proposes an analysis based on restricting the PP internal subject hypothesis to Place PPs. Section 6 concludes the paper.

2. Binding and discourse conditions under spatial prepositions

The variable occurrence of anaphors under prepositions describing relations in space have raised conflicts for syntactic theory since at least Lees and Klima (1963). Given the general complementarity of English pronouns and anaphors, spatial prepositions stood out in embedding both forms in similar configurations, as in (14)-(15).

(14) (a) The men₁ cast a smokescreen around themselves₁. (Lees and Klima 1969: 12-13)

(b) The men₁ found a smokescreen around them₁.

(15) (a) John₁ smeared the oil on himself₁. (Lees and Klima 1969: 34-44)

(b) John₁ ignored the oil on him₁.

The Binding Theory (Chomsky 1981, 1986) defined the domain of interpretation for anaphors as the minimal phrase containing the anaphor and a syntactic subject, and restricted pronouns from local coreference in the same domain.¹ Since Hoekstra (1988), spatial prepositions are assumed to project a small clause, including a subject which denotes the located entity, or Figure in the terms of Talmy (1976). Svenonius (2003) assumes that the subject of the preposition is introduced by a little *p* projection, which corresponds to little *v* in verb phrases.

In a line of work starting Lee-Schonefeld (2004), locality is phrased in terms of phase theory (Chomsky 2001), and the binding domain is reduced to the phase (Canac-Marquis 2005, Quicoli 2008, Antonenko 2012, Despić 2015, i.a.) or its spell-out domain (Charnavel and Sportiche 2016). The projections that are traditionally considered as phases in the literature are mostly CP, *v*P and a subset of DPs, and should also include PP or *p*P .

If PPs project internal subjects, it follows that only the internal subject should be available as an antecedent for reflexive anaphors, i.e. *smokescreen* and *oil* in (14)-(15), respectively. This is contradicted by the acceptability of reflexives coreferring with *the man* and *John* in the (a) sentences. Further challenge is raised by PP-anaphors that are completely interchangeable with pronouns, as in (16).

- (16) (a) John₁ found a snake next to {him₁/himself₁}.
 (b) John₁ spilled the gasoline all over {him₁/himself₁}. (Kuno 1987: 9.24)
 (c) John₁ believes that letter was sent to everyone but {him₁/himself₁}. (Zribi-Herz 1989: 16c)

Such cases were often explained via defining larger domains of interpretation for anaphors comparing to pronouns, such that pronouns are free within the PP while reflexives are bound within the IP (Hestvik 1991, Buring 2005). Others consider both forms to be locally free in these configurations: the pronouns follow the Binding Theory, while the reflexives are licensed through further discourse properties, and are labeled accordingly as Irregular Reflexives (Cantrall 1974), Discourse-Level Anaphors (Zribi-Hertz 1989), Exempt Anaphors (Pollard and Sag 1992) and Logophors (Sells 1987, Reinhart and Reuland 1991).

¹ The Binding Theory does not distinguish complex anaphors like the English *self*-anaphor from simple anaphors like the French *se*, German *sich* etc, which were claimed to have larger domains of interpretation. Faltz (1977) and Déchaine and Wiltschko (2017) treat complex and simple anaphors as different categories based on a range of distinctive properties, while Siloni (forthcoming) shows that French *se* anaphors themselves consist of more than one type. This paper focuses on complex anaphors, under the understanding that form a distinct class.

The cited literature maintains a role for syntactic constraints in the licensing of logophoric reflexives, yet it is agreed that they require specific discourse conditions to be acceptable. Most notably, being the center of perspective has been repeatedly recognized since Ross (1970) as crucial in licensing anaphors under prepositions. The sentences below demonstrate in various ways that exempt anaphors become unacceptable when the center of perspective is shifted away from their referent.

- (17) (a) As for me/**myself**, I will not be invited. (Ross 1970: 32)
 (b) As for her/***herself**, she will not be invited. (Ross 1970:28-29)
 (c) Glinda₁ said that, as for her₁/**herself**₁, she will not be invited.
 (d) Harry₁ told Glinda₂ that, as for her₂/***herself**₂/him₁/himself₁, she/he will not be invited.
- (18) (a) They₁ placed their guns, as they looked at it, in front of {***them**₁/**themselves**₁}.
 (b) They₁ placed their guns, as I looked at it, in front of {them₁/***themselves**₁}.
 (Cantrall 1974: 16a)
- (19) (a) According to Mary, John is a little taller than her/**herself**.
 (b) As for Mary, John is a little taller than her/***herself**. (Rooryck and Vanden Wyngaerd 2007: 32)
- (20) (a) John₁ was going to get even with Mary. (Pollard and Sag 1992: 46-47)
 That picture of **himself**₁ in the paper would really annoy her.
 (b) ***Mary** was quite taken aback by the publicity John₁ was receiving.
 That picture of **himself**₁ in the paper really annoyed her.

Among other environments, spatial anaphors were considered particularly sensitive to perspective, since it determines the center according to which spatial relations are calculated.² Cantrall (1974) suggested that reflexive anaphors are interpreted locally with respect to the point of view (speaker, addressee, other entities), which is represented in the left periphery of the clause. Covert binders representing point of view were also suggested by Ross (1970),

² The system in Sells (1987) defines the deictic center as a source of logophoricity, alongside the attitude holder and empathy locus. Charnavel (2020) rejects this based on examples like the following, where the use of the phrase *ton cher* ‘your dear’ signals that the empathy locus is the addressee and makes it impossible for a reflexive under the preposition to corefer with the deictic center *la jeune femme*.

- (i) Sur ce tableau de ton cher ancêtre, la jeune femme est à l’arrière-plan, avec une viole de gambe derrière {elle/***elle-même**}.
 ‘In this painting by your dear ancestor, the young woman is standing in the back with a Viola de Gamba behind {her/***herself**}.’

Svenonius (2006), Rooryck and Vanden Wyngaerd (2007) and Charnavel and Sportiche (2016), and enabled to explain variation in anaphor licensing through shifts in the center of perspective.

Kuno (1987:) added the factors of directness and physical contact, stating that “reflexives with clause-mate antecedents require that their referents be targets of the actions or mental states represented by the verb phrase” (187: p.153). The syntactic position of P anaphors is described as “weak” comparing to direct object position, which makes it more sensitive to discourse condition. In the following examples, the use of pronouns is said to express a general location (a sentences), while the reflexive anaphors force a meaning where there is direct contact between the entities (b sentences).³

- (21) (a) John₁ put the blanket **under him**₁. = general spatial area
 (b) John₁ put the blanket **under himself**₁. = physical contact
 (Kuno 1987: 1.1)
- (22) (a) John₁ hid the book **behind him**₁. = general spatial area
 (b) John₁ hid the book **behind himself**₁. = physical contact
 (Kuno 1987: 1.2)
- (23) (a) Mary₁ kept her childhood dolls **close to her**₁. = in her proximity
 (b) Mary₁ kept her childhood dolls **close to herself**₁. = close to her body
 (Rooryck and Vanden Wyngaerd 2007: 11)

Modern Hebrew PPs also exhibits variation in anaphor licensing, but this does not correspond with point of view or physical contact, but rather with the preposition that heads the PP. The sentences in (24) demonstrate that, within the same context, the preposition *el* ‘to’ requires a reflexive anaphor for coreference, *leyad* ‘next to’ requires a pronoun and *me’al* ‘above’ takes either.

- (24) (a) sara zoreket et ha-kadur { **ele-a/el* acma }.
 S. throws ACC the-ball to-her to herself
 ‘Sara throws the ball toward *her/herself.’
- (b) sara zoreket et ha-kadur { *leyad-a/ *leyad* acma }.

³ Kuno distinguishes between empathic and logophoric reflexives, which is not relevant for the current purposes, but see Oshima (2007) for a brief overview.

S. throws ACC the-ball next.to-her next.to herself
 ‘Sara throws the ball toward her/*herself.’

- (c) sara zoreket et ha-kadur {me’al-ea/ me’al acma}.
 S. throws ACC the-ball over-her over herself
 ‘Sara throws the ball over her/herself.’

These patterns appear to be stable and not affected by shifts in perspective, as shown in (25). Prepositions that accept the reflexive anaphor with a neutral perspective in (25a) do so in the context of the fans’ perspective in (25b).

- (25) (a) sara zarka et ha-kadur {el/ me’al/ *leyad} acma₁.
 S. threw ACC the-ball to above next.to herself
 ‘Sara threw the ball to/above/*next to herself’
- (b) ha-ohadim ka’asu še-sara₁ zarka et ha-kadur {el/ me’al/ *leyad} acma₁.
 the-fans raged that-S. threw ACC the-ball to above next.to herself
 ‘the fans raged that Sara threw the ball to/above/*next to herself’

The preference for a reflexive with *el* ‘to’ is expected in Kuno’s framework, since it conveys direct reciprocity more than other prepositions. However, *leyad* and *me’al* do not differ from each other in terms of directness, affectedness or physical contact; if anything, the concept of ‘next to x’ is more proximate to an object than ‘above x’. Yet, *leyad* in (24b) rejects the reflexive anaphor, unlike *me’al* in (24c). Furthermore, in the Hebrew counterparts of (21)-(23), presented in (26), only pronouns are acceptable, even if the meaning of direct physical contact is intended.

- (26) (a) yoni₁ hestir et ha-sefer {me’axorav₁/ *me’axorey acmo₁}.
 Y. hid ACC the.book behind.him behind himself
 ‘John hides the book behind him/*himself’
- (b) yoni₁ sam et ha-smixa {mitaxtav₁/ *mitaxat le-acmo₁}.
 Y. put ACC the.blanket under.him under to.himself
 ‘John put the blanket under him/*himself’
- (c) miri₁ šamra et ha-ca’acu’im šela karov {ele’a₁/ *le-acma₁}.
 M. kept ACC the.toys hers close to.her to.herself
 ‘Mary kept her toys close to her/*herself’

The contrasts observed in Hebrew are therefore not sensitive to point of view and direct contact, but they do seem to correspond with the type of preposition used. *el* ‘to’ and *me’al* ‘above, over’ contrast with *leyad* ‘next to’ in their ability to describe a path of changing location. The emerging generalization is therefore that, all other things being equal, Hebrew path prepositions license reflexive anaphor where place prepositions do not. A similar contrast was raised in Wechsler (1997) for the English *to* vs. *behind* (27) and *onto* vs. *beside* (28).

- (27) (a) Bubba₁ tossed the beer can behind {him₁/*himself₁}. (Wechsler 1997: 38-39)
 (b) Bubba₁ tossed the beer can to {*him₁/himself₁}.
- (28) (a) Corporal Crump₁ pinned the medal beside {him₁/*himself₁} (on the wall).
 (b) Corporal Crump₁ pinned the medal onto {*him₁/himself₁}

A more straightforward comparison between Hebrew and English can be performed using the methods in Charnavel and Sportiche (2016) and Charnavel (2019, 2020), who propose that syntactic constraints on reflexives should be diagnosed using inanimate anaphors, to control for logophoric occurrences. This is based on cases like (29), where an animate anaphor coreferring with *Mary* can be interpreted beyond its clause, which is not possible for the inanimate anaphor coreferring with *the earth* in a similar configuration.

- (29) (a) Marie₁ s’inquiète souvent du fait que ses enfants dépendent d’elle₁-même.
 ‘Mary is often worried that her children depend on herself’.
- (b) La Terre₁ est dégradée par les êtres humains même si leur avenir ne dépend que d’elle₁ (*même).
 ‘the earth is degraded by human beings even if their future only depends on it(*self)’.
- (Charnavel and Sportiche 2016: 29 and fn 28)

Applying animacy diagnostics to English PPs reveals that, contrary to the common understanding that spatial anaphors freely interchange with pronouns due to logophoricity, it is actually a subset of them that does so. Table 1 compares animate and inanimate pronouns in object position and across various types of prepositions, in English and Hebrew. The judgments reveal systematic complementarity of pronouns and anaphors in all cases except for animate anaphors under place prepositions, where English speakers accept both a pronoun and an anaphor.

	[+ animate]	[– animate]
Direct object	sara ₁ ra'ata { *ota ₁ / et acma ₁ }. Sara ₁ saw { *her ₁ /herself ₁ }.	ha-radar ₁ 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 a signal to { *it ₁ /itself ₁ }.
Spatial P	Path sara ₁ zarka et ha-kadur { *ele'a ₁ /el acma ₁ }. Sara ₁ threw the ball toward *her ₁ /herself ₁ .	ha-catapulta ₁ he'ifa even { *le-kivuna ₁ / le-kivun acma ₁ }. The catapult ₁ threw a stone toward { *it ₁ /itself ₁ }.
	Place sara ₁ ra'ata naxaš { leyada ₁ /*leyad acma ₁ }. Sara ₁ saw a snake next to { her ₁ /herself ₁ }.	ha-radar ₁ ziha matos { leyado ₁ /*leyad acmo ₁ }. The radar ₁ detected an aircraft { next to it ₁ /*itself ₁ }.

Table 1: The effect of animacy on anaphor licensing by syntactic position

This shows first that the distribution of pronouns and anaphors in spatial PPs is not free but predictable, and second, that when logophoric uses are excluded, path and place prepositions seems to contrast each other in anaphor licensing. The following section examines whether these patterns can be accounted for thorough models based on speaker expectations.

3. Accessibility and expectations

Ariel (1988, 1991, 2001) has argued that the variation between full NPs, pronominal elements, demonstratives and gaps correlates with the extent to which the referent is accessible in memory storage. Accessibility of reference is described as a complex object involving linguistic and extra-linguistic factors, such as discourse prominence, distance from the antecedent, the period when the individual has entered memory, the importance of the topic of discussion for the speaker and their mental connection with the referents. Within this framework, pronouns and reflexives are cues for high accessibility of reference, with the reflexive anaphor marking higher accessibility due to either short distance from the antecedent or discourse prominence. Kemmer (2005) adopted this view and discussed in more details how the various factors related with accessibility derive both local and non-local occurrences of English *-self* anaphors.

In later work, Ariel (2008) takes expectations to be the crucial factor in the competition between pronoun and reflexive. This view goes back to Faltz (1977) Kemmer (1993) and

Comrie (1999), and is based on the cross-linguistic observation that reflexive pronouns are more common with predicates that are typically other-directed (e.g. *hit*, *talk with*) than self-directed (*wash*, *shave*). For the latter class of predicates, speakers generally prefer other reflexive strategies, such as middles, intransitive reflexive verbs or simple anaphors (see also Haspelmath 2007).

Ariel examines the frequency in which predicates appearing in corpora take coreferential or disjoint objects, and the correlation with the extent to which these predicates appear with reflexive pronouns in object position. For example, the verb *hit* is reported to have only one case of a subject-object coreference out of 110 occurrences, while *dress* had only 4 cases of disjointness in 60 occurrences. Ariel assumes that speakers generalize on such trends and develop an inference of disjointness, which motivates using a morphologically marked reflexive, a principle suggested on theoretical grounds in Levinson (1987). Accordingly, *hit* is predicted to take a reflexive when coreference is intended, while *dress* is predicted to be used as an intransitive, as the corpus analysis confirms.

The picture is less clear with objects of spatial prepositions, which should trivially give rise to a disjointness inference. Since such prepositions usually embed places rather than individuals, it can be assumed that they do not refer back to the subject in the majority of occurrences. Consequently, the theory predicts that a reflexive anaphor will be preferred for coreference in these contexts. However, Ariel notes that, in the Santa Barbara corpus, spatial prepositions prefer coreferential pronouns over reflexives in object position. In the quoted examples, given in (30), the prepositions are all of the type Place, and the choice between a pronoun and an anaphor appears to be predictable from the Binding Theory, if the binding domain is defined as the thematic domain of the preposition (or spatial adverb). In (30a-b), the subject and object of the preposition are disjoint and a pronoun is used to express coreference with a long-distance subject, while in (30c) the preposition's arguments are coreferential, and a reflexive is used accordingly.

- (30) (a) He₁ felt **something** near **him**₁. (Ariel 2008: 36-37)
 (b) Can you₁ reach **the pepper** behind **you**₁.
 (c) **You**₁ were a little behind **yourself**₁.

Ariel's analysis captures a different alternation of spatial anaphors, known since Chomsky (1965), where deictic motion verbs taking corresponding deictic path prepositions do not

require a reflexive pronoun to express coreference with the subject, as shown in (31). The combination of *push* and *from*, *draw* and *toward* creates predications which are turned toward the acting Agent, and are in this sense self-directed. The fact that they do not require a reflexive to denote a coreferential target is therefore in line with the expectation hierarchy proposed by Ariel, and earlier typological generalizations. Lederer (2013) has shown that when the verbs and the prepositions code opposite directions, a reflexive is once again required, as in (32).

(31) (a) I **pushed** it away **from** {me/*myself}. (Chomsky 1965 p.146-147)

(b) I **drew** it **toward** {me/*myself}.

(32) (a) John₁ **pulled** the book away **from**{himself₁/??him₁}. (Lederer 2013: 4.70-4.71)

(b) John₁ **pushed** the book **toward** {himself₁/??him₁}.

Similar alternations are attested in Hebrew with the verbs *mašax* ‘pulled’ and *daxaf* ‘pushed’, and they raise questions regarding Condition B effects. The current paper does not investigate this phenomenon further, but rather avoids combinations where the verb and preposition are compatible deixis to control for these effects.

4. Path and Place

The former sections have established that some of the binding effects across spatial prepositions cannot be reduced to discourse-pragmatic factors. I take this to indicate that the traditional assumption that spatial PPs are binding domains only holds for a subset of the category. This section examines the extent to which the status of the PP as a binding domain can be predicted independently from theories of P syntax.

Within the category P, spatial PPs are recognized as a distinct set and are often assigned a unified syntactic structure. Since Jackendoff (1973), the standard analysis assumes an incremental syntax where path and place are layers aligned in the universal order of path over place. For example, a preposition like *into* is assumed to be formed through raising of the place projection *in* above the path *to*, as in (33)

(33) *in*_I [_{Path} *to* [_{Place} *t*_I [_{NP} *the house*]]]

Later works have added layers for spatial modifiers (Koopman 2000), regional dimensions (Svenonius 2006; Rooryck and Vanden Wyngaerd 2007; Vanden Wyngaerd 2019; Matushansky

and Zwarts 2019) and further decomposition of the path concept (Pantcheva 2011). A representative extended PP is given in (34).

(34) [Path *from* [Place *in* [AxPart *front* [Kase *of* [D *the car*]]]] (Svenonius 2006: 8)

A specific role in the licensing of PP anaphors is attributed to nominal heads known as Axial Parts, which code the different regions of an entity (in English: *front*, *back*, *top*, *bottom*). According to Svenonius (2007) and Rooryck and Vanden Wyngaerd (2007), covert AxPart projections serve as local antecedents within the PP and license anaphors in cases like (35), repeated from (23). Interchangeability with pronouns is then explained via the indexical possibilities of the AxPart, which can refer either to the subject or the speaker, and license a reflexive or a pronoun, respectively (36).

(35) (a) Mary kept her childhood dolls close to herself. (Rooryck and Vanden Wyngaerd 2007: 54)

(b) Mary kept her childhood dolls close to her.

(36) (a) Subject-centered interpretation:

[_{IP} Mary₁ kept her dolls [_{Place} close [_{AxPart} \emptyset_1 [_K to [_D herself₁]]]]

(b) Speaker/Observer-centered interpretation

[_{Evid} Speaker₁ [_{IP} Mary₂ kept her childhood dolls [_{Place} close [_{AxPart} \emptyset_1 [_K to [_D her₂]]]]]]

The hierarchical PP therefore explains why place prepositions give rise to free variation of pronouns and reflexives. However, it predicts that the same variation will occur under path prepositions, since the path phrase contains a place layer which should also include Axial Part. Studies including Wechsler (1997) Lederer (2013) and Bryant (2021) have showed that counter to this prediction, path prepositions require reflexive anaphor for coreference, as in (37) (repeated from 28b).

(37) Corporal Crump₁ pinned the medal onto {*him₁/himself₁}. (Wechsler 1997: 39)

While the preference for a reflexive in (37) could be explained, following Kuno (1987), by physical contact and directness of action, Sentence (39) shows that a reflexive is also strongly preferred where no contact is involved.

(38) Corporal Crump₁ turned the medal toward { % ?him₁/himself₁ }.⁴

Büring (2005) discussed subcategories within spatial PPs based on their selectional status, such that spatial PPs (path or place) that surface as arguments get a similar status to that of dative PPs such as *to*- and *for*-phrases. Locative adjuncts, which are also headed by place prepositions, were singled out as non-selected, as shown in Table 2.

	Example	Selection	Anaphoric variation
Dative arguments	<i>talk</i> [PP <i>to x</i>]	+	–
Path/place arguments	<i>look</i> [PP <i>around x</i>]	+	+
Locative adjuncts	<i>hear a sound</i> [PP <i>behind x</i>]	–	+

Table 2: P constructions according to selection and anaphor licensing (Büring 2005)

The resulting typology reveals no correlation between selection status and free variation of pronouns and anaphors, which is surprising given that most approaches to binding take selected arguments to be part of the thematic domain of the verb, and consequently of its binding domain. Büring’s solution was that for prepositions with lexical content, pronouns are free in the theta domain of P, while the domain of reflexives is defined by the first overt subject. This again explains the free variation with place prepositions, but overlooks the fact that path prepositions do not allow it, as seen in (37)-(38) above. To account for the behavior of paths, I suggest to revise Büring’s system to include the lexical meaning of the preposition, as in Table 3.

	Example	Selection	Anaphoric variation
Dative arguments	<i>talk</i> [PP <i>to x</i>]	+	–
Path phrases	<i>look</i> [PP <i>toward x</i>]	+	–
Place phrases	<i>look</i> [PP <i>around x</i>]	+	+
	<i>hear a sound</i> [PP <i>behind x</i>]	–	+

Table 3: Revision of Büring (2005)

This leaves one inconsistent group, of place phrases like *look around x*. which are selected arguments but still allow for the free variation that is characteristics of independent domains, where pronouns are free of binding and anaphors are licensed by discourse conditions. Such constructions are known as derived goals, and they are a focus in Gehrke (2008), who aims to

⁴ Based on judgments from five native speakers of English, ranging between rejection and dispreference of the coreferential reading of the pronoun.

explain the systematic ambiguity they exhibit with locative constructions, demonstrated in (39) using the prepositions *in*.

(39) Sharon jumped in the lake. (Gehrke 2008: 5)

(a) paraphrase of the locative reading:

Sharon jumped while being in the lake (i.e. the jumping took place in the lake).

(b) paraphrase of the directional reading:

Sharon jumped and (as a result) she ended up in the lake.

Gehrke reduced the two meanings to syntactic ambiguity, where the PP's merging site determines the meaning, as follows: a place PP which merges as an adjunct denotes the event's general location, while the same PP merging as a complement to the verb denotes the final location in a motion event. In the latter case, the overall meaning is of change of location, which is invariably related with PP complements.

This explains why path phrases enable local binding and exhibit complementarity of pronouns and anaphor, while stative place phrases give rise to free variation of pronouns and anaphors. The set of derived goals remains a question, since they are reported to allow free variation despite being complements to V. In Hebrew, such constructions block reflexive anaphors, on a par with stative locative constructions, as shown in (40).

(40) (a) sara₁ zoreket et ha-kadur { leyad-a₁/ *leyad acma₁ }.

S. throws ACC the-ball next.to-her next.to herself

'Sara throws the ball next to her/*herself.'

(b) sara₁ šomeret et ha-kadur { leyad-a₁/ *leyad acma₁ }.

S. keeps ACC the-ball next.to-her next.to herself

'Sara keeps the ball next to her/*herself.'

The syntactic position of the PP is therefore not sufficient to determine its status as a binding domain, which brings back the hypothesis of the PP internal subject, assumed by many including Hoekstra (1988), Svenonius (2003), Folli and Ramchand (2005), Folli and Harley (2006), Ramchand (2008) and Mateu and Acedo-Matellán (2012). If this analysis is only applied for Place PPs, whether adjuncts or complements, then the binding facts presented throughout the paper become predictable, as shown in Table 5.

		Selection	Syntactic position	Internal subject	Anaphoric variation
Dative arguments		+	Complement	–	–
Path phrases		+	Complement	–	–
Place phrases	Derived goal	+	Complement	+	+
	Locative adjunct	–	Adjunct	+	+

Table 5: P constructions according to selection, position, internal subject and anaphor licensing

It is important to note that alongside the small-clause approach, there are views that categorically reject this analysis of spatial PPs and take them to form complex predicates with the verb (Williams 1980, Baker 1988, Neeleman 1994, Rothstein 2006, 2012, 2013, den Dikken 2015). In a complex predicate analysis, the binding domain of the PP is united with that of the verb, and both subjects should be considered as local. The patterns of anaphor licensing showed here suggest that this analysis should be restricted to Path PPs. This would provide a simple explanation for two seemingly incompatible properties of path prepositions, which are on the one hand similar to dative PPs in that they introduce selected arguments, but while dative prepositions are fixed, path prepositions may code a relatively diverse set of paths:

- (41) (a) Sara sent letters to the city hall.
 (b) Sara ran {to/toward/around/under/through} the city hall.

A complex predicate analysis of paths may also integrate the proposal in Botwinik-Rotem (2003), that path prepositions diverge from place preposition in that the external argument of the former is not an entity but a Davidsonian event argument. Path phrases can then combine with motion verbs through event identification, along the lines of Kratzer (2005), while place phrases project NP subjects and maintain an independent predication. An additional option goes back to Dowty (1979), who suggests that Path is a two-place predicate that takes V (motion verb) and N (location) as arguments.

Following van Dooren et al. (2014), the analysis proposed here takes Path PPs to be arguments of the verb, to accommodate the fact that they have to be licensed by a verb (or a noun) denoting a motion event, and that Path itself often behaves like a selected argument. The following comparison with direct and indirect objects demonstrates that all three are necessary in certain contexts and optional in others.

- (42) (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)
- (43) (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)

Either way, the main claim of the current paper is that only place prepositions project an internal subject, and that this is determined at the lexical level even if the overall meaning is a directional one.⁵

A final piece of the puzzle is that Hebrew derived goals may be ambiguous not only with respect to stative readings, but also with respect to path readings. In Hebrew, prepositions like *me'al* 'above, over', *mitaxat* 'under' and *misaviv* 'around', *al* 'on, at', and possibly *me'axore* 'behind' and *lifne* 'in front of', may code either a place (stative or goal) or the path of motion, as demonstrated in (44)-(45).

- (44) sara kafca me'al ha-brexa.
 S. jumped over the-pool
 'Sara jumped above the pool.'

Meaning A (locative): Sara jumped in a location above the swimming pool.

Meaning B (path): Sara jumped to the other side of the pool through the space above it.

- (45) sara raca mitaxat la-gešer.
 S. ran under the-bridge
 'Sara ran under the bridge.'

Meaning A (locative): Sara ran in a location under the bridge.

Meaning B (path): Sara ran to the other side of the bridge through the space below it.

Along with the structural ambiguity already presented between paths and derived goals, Hebrew spatial PPs may therefore give rise to three-way ambiguous sentences, as in (46).

- (46) mitzi gilgela et ha-kadur mitaxat la-sapa.
 M. rolled ACC the-ball under the-sofa

⁵ More lexically-driven contrasts are shown in Rothstein (2006), Botwinik-Rotem (2008), den Dikken (2010), Breuning (2018).

‘Mitzi rolled the ball under the couch.’

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

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)

This explains cases which were presented but unattended, where Hebrew prepositions allow pronouns and anaphors to interchange in a seemingly logophoric setting, as in (47).

(47) (a) sara zoreket et ha-kadur {me'al-ea/ me'al acma.}

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

‘Sara throws the ball over her/herself.’

(b) sara gilgela et ha-štixim {misviva/ misaviv le-acma}.

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

‘Sara rolled the carpets over her/herself.’

Similar sentences in English are explained via a logophoric analysis, where the reflexives are used to express the first-personal perspective of the subject. In Hebrew, logophoric interpretation of the reflexive is generally unavailable, and it can be shown that inanimate anaphors also interchange with pronouns under the same prepositions, as in (48).

(48) zramim xašmalijim₁ yocrim sadot magnetiyim {misvivam₁/ misaviv le-acmam₁}.

streams electric generate fields magnetic around.them around to-themselves

‘Electric streams generate magnetic fields around them/themselves.’

This variation can therefore be explained as a case of lexical ambiguity between path and place meanings. Table 6 summarizes all the possible combinations of verbs and prepositions presented thorough the paper.

V	P	Pron.	Refl.	Example
(a) Ditransitive	Dative	*	✓	Sara ₁ šolaxat {*la ₁ /le-acma ₁ } et ha-mixtav ‘Sara sends the letter to *her/herself’
(b) Stative	Place	✓	*	Sara ₁ šomeret et ha-kadur {leyada ₁ /*leyad acma ₁ } ‘Sara keeps the ball with her/*herself’
(c) Motion	Place Endpoint	✓ ✓	* *	Sara ₁ zoreket et ha-kadur {leyada ₁ /*leyad acma ₁ }. ‘Sara throws the ball next to her/*herself’

(d) Motion	Endpoint	✓	*	Sara ₁ zoreket et ha-kadur {meale'a ₁ / me'al acma ₁ }.
	Path	*	✓	'Sara throws the ball over her/*herself'
(e) Motion	Path	*	✓	Sara ₁ zoreket et ha-kadur {*ele'a ₁ /el acma ₁ }.
				'Sara throws the ball to her/*herself'

Table 6: Licensing of coreferential pronouns and reflexive anaphors according to the possible interpretations of the verb and preposition

5. Proposal

The patterns of anaphor licensing presented in previous sections were shown to be resistant to shifts in animacy and point of view, and predictable from their core meaning and syntactic analysis. Following the findings in Section 4, I suggest that the class of spatial prepositions should be divided with respect to the PP-internal-subject hypothesis, as follows:

- (49) (i) Place Ps project an internal subject and define an independent binding domain.
(ii) Path Ps are part of the binding domain defined by the nearest subject.

Since the notion that spatial PPs stand out among other prepositions in their predicative traits is already widespread in the literature, the essence of the current suggestion is restricting these properties to the set of place prepositions, and linking it with the binding facts.⁶ An immediate prediction a narrower distribution of Path Ps comparing to Place Ps, since the former are selected by motion predicates while the latter can potentially modify any event. This is consistent with the well-known observation that only place prepositions appear freely in predication constructions, while path prepositions are only acceptable if the subject itself denotes a motion event:

- (50) (a) {The students/the trips} were {in/next to/behind/in front of/around} the valley.
(b) {*The students/the trips} were {to/toward/into/through} the valley.

From a structural perspective, Path PPs merge as complements to V and introduce a path argument, along the lines of *by* phrases (Bruening 2013) and applicatives (Pylkkänen 2008). Place Ps are either two-place predicates projecting a syntactic subject, or one-place predicates selected by *p*, which in turn introduces the subject. With this internal structure, they can merge

⁶ Botwinik-Rotem (2008: fn1) makes a similar suggestion, as she analyzes the directional preposition *le-* on a par with non-spatial prepositions. Note that directional *le-* shares form with the indirect object preposition *le-* (for this reason the current paper uses the unambiguously directional *el* 'to').

either as complements or as adjuncts, in accordance with Gehrke (2008).

For the completion of the analysis, it should be specified whether the statement that the theme of motion (Figure argument) is introduced within the PP means that verbs in derived-goal constructions have no direct objects. In terms of binding, (51)-(52) show that the Figure entity can be locally bound by the verb's subject, which could indicate that they are co-arguments.

(51) sara₁ zarka et acma leyad ha-kadur.

S. threw ACC herself next.to the-ball

'Sara threw herself next to the ball'.

(52) (a) The player₁ threw { *him₁/himself₁ } against the wall.

(b) My graphic processor₁ threw itself₁ off a cliff.

(Web example)

This does not necessarily mean that the direct-object position is realized, as the phase impenetrability condition (Chomsky 2001), and the definition of binding domains as spell-out domains (Charnavel 2019) say that the edge of the phase is accessible for operations beyond the spell-out domain. This means that the PP's subject could be accessible to operations in the VP, and that assuming an additional direct object position is redundant in this respect.

However, there is also thematic indication that the Figure is not separate from the verb. First, it takes accusative case, which is marked in Hebrew by the morpheme *et*. Second, (60) shows that the Figure has a thematic relation with the verb that cannot be cancelled, in contrast with classic small-clause constructions like the complement of to the verb *make*.

(53) (a) The player threw the ball against the wall (# but she didn't throw the ball).

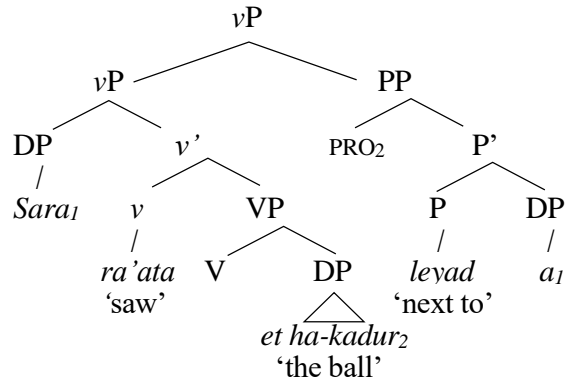
(b) Mary made the dress fit (but she didn't make the dress).

(Rothstein 2006 p.214)

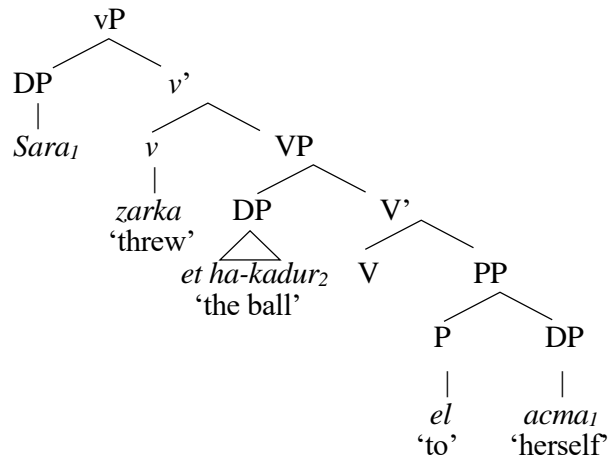
The theme of motion/figure argument therefore seems to occupy both positions, which points to a configuration of raising from the lower position or control over a covert argument. Since raising operations normally target non-thematic (subject) positions, which is not the case here,

I adopt a control analysis for the purposes of this paper. Schematic representations of the three suggested structures are given in (54)-(56).^{7,8}

(54) Location (Place P)



(55) Direction (Path P)

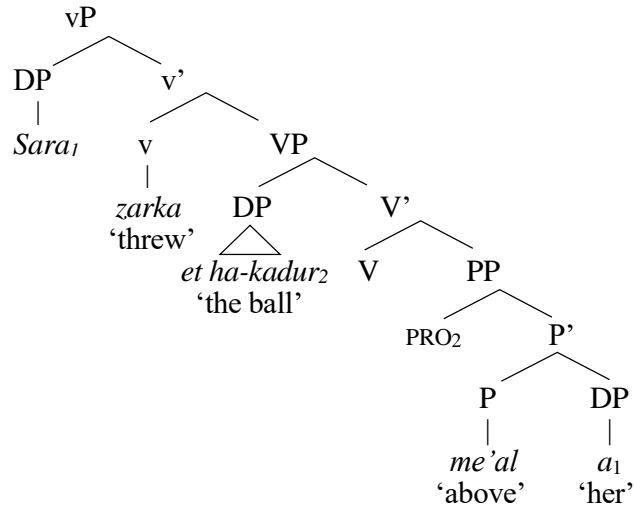


⁷ Raising to object was justified by Postal (1974), Lasnik & Saito (1991) and Runner (2006) for complements of ECM verbs. A raising analysis for the constructions discussed here, as in (i), is compatible with Mateu & Acedo-Matellán's (2012) structure for resultatives, demonstrated in (ii).

- (i) Sara throws the ball₁ [t₁ toward herself].
- (ii) Joe₁ climbed [t₁ out of the tunnel].

⁸ Spec, VP position is not regarded as a subject position, since V and *v* behave as one domain in terms of binding (i.e. VP is not a phase). Though the distinction between *v* and V is a theoretical standard, this split is often overcome in order to account for various syntactic and semantic phenomena that relate to *v* and V as one object, by means of describing vP as the maximal projection of V (Chomsky 2008, Bruening 2014), assuming that the direct object raises from VP to vP (Charnavel & Sportiche 2016), or eliminating *v* as a separate projection (Horvath & Siloni 2002, 2016).

(56) Derived goal (Place P)



I adopt Charnavel's version of Condition A, stated in (57), which identifies the binding domain with the spell-out domain of the phase. Since place prepositions were shown to systematically block binding, it follows that PlaceP is a phase projected either by the P head or by the head little *p* assumed by Svenonius (2003), including in contexts of derived goal, and that PathP is not a phase.

(57) Condition A: a plain anaphor must be interpreted within the spell-out domain containing it.

(Charnavel and Sportiche 2016 p.30)

The binding domain of path prepositions therefore includes the VP/*vP* and any associated arguments, while the binding domain of place prepositions is restricted to the PP and the PP internal subject. The analysis accounts for the Hebrew facts, as well as some of the contrasts observed by Wechsler (1997) and Lederer (2013) for English. It also provides a possible explanation to the long-standing puzzle in Lees and Klima (1963), repeated again as (58)-(59).

(58) (a) The men₁ cast a smokescreen around themselves₁.

(b) The men₁ found a smokescreen around them₁.

(59) (a) John₁ smeared the oil on himself₁.

(b) John₁ ignored the oil on him₁.

In both pairs, a reflexive occurs when the verbs (*cast, smear*) denote motion events which select a path argument, and a pronoun is used with stative verbs (*find, ignore*) that block path readings of prepositions.

The remainder of this section outlines a number of predictions of the proposed analysis, some of which partially discussed in previous sections:

- (i) Local binding between the located entity (Figure) and the location is always available.
- (ii) Result state meaning is part of the semantics of derived-goal constructions, but not paths.
- (iii) Interchangeability of pronouns and (local) anaphors indicates that the preposition has both a place and a path reading, one of which is cancelled upon disambiguation.

5.1 Prediction I: The Figure is always local

The proposed structures place the Figure argument as a local antecedent for the preposition's object in all possible configurations. In particular, the structures of Place and Derived Goal suggest that the preposition itself is not a barrier to binding, as, for example, a complementizer would be, but it rather defines a binding domain which includes the PP internal subject.

Examples that indicate the locality of the Figure argument in place PPs do not often occur naturally, since binding between the subject and the object of a locative preposition tends to be blocked by world knowledge.⁹ It can nonetheless be shown that in contexts that support a proxy reading, a reflexive is used to express coreference with the PP's subject.¹⁰

(60) Context: The owner of Grumpy Cat took it to see its model at the wax museum.

(a) sara {šamra/henixa}et ha-xatul {*leyad-o/ leyad acmo}.

S. kept placed ACC the-cat next.to-him next.to himself

‘Sara kept/placed the cat next to *it/itself.’

(b) sara₁ yoševet {leyad acma₁/ *leyada₁}.

S. sits next.to herself her

‘Sara sits next to herself/*her.’

⁹ But see Sentence (30c) in Section 3.

¹⁰ For a discussion of proxy readings see Jackendoff (1992), Reuland & Winter (2009); Sportiche (2014), *inter alia*.

5.2 Prediction II: Paths are not results

The distribution of result meanings can be shown to independently support a small-clause analysis of place phrases. In Hoekstra (1988), small-clause constituents correspond with result state meanings, which in the context of spatial PPs refers to the state of arrival at the named location. The analysis proposed here determines that such meanings would only be part of the semantics of place prepositions. While meaning of arrival can follow from various parts of the sentence, including the preposition, the verb, properties of tense and aspect and even broader context, it is predicted that, all else being equal, the meaning of arrival should be harder to cancel in derived goals, comparing to path constructions.

Various evidence 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 the former tend to “emphasizes” the path of motion while the latter emphasizes the goal of motion.

Second, while the traditional literature on spatial PPs relates 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 in (61).

(61) (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)

(Rappaport Hovav 2008 p.29)

Bruening (2018) shows that depictive predicates joining path constructions can only access the path, and not the result state. As a result, it can be negated that an adjective like *wet* in (64a) holds at the state of arrival. The same is not true for a derived-goal configuration including the place preposition *in* (64b).

(62) Albert walked to the flat wet but got there dry.

(adapted from Bruening 2018: 13)

(63) Albert walked in the flat wet # but got there dry.

Martin et al. (2021) showed further in a series of experiments that arrival entailments are generally cancellable for English *to*, German *zu* and French *à*. For example, in a context like (64), 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.

(64) Yesterday Paul had a math test, but wasn't well prepared. He biked/went to the school
(but on the way he ran into a couple of friends who were going to the swimming pool)

Q: How safely can you conclude that Paul reached the school?

Finally, the following minimal pairs demonstrate that path and derived-goal constructions vary systematically with regard to entailments of arrival. Configurations headed by path preposition (a sentences) are compatible with a negative continuation, whereas the same configurations headed by place prepositions (b sentences) resist negation.

(65) (a) She kicked the ball **to** his face (but he dodged it).

(b) She kicked the ball **in** his face (#but he dodged it).

(66) (a) I threw the book **to** Mary (#but aimed badly and it didn't get there).

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

(67) (a) Kim launched a rocket **to** Okinawa (but it blew up before it got there).

(b) Kim launched a rocket **over** Okinawa (#but it blew up before it got there).

(68) (a) zarakti et ha-sefer **la**-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 back yard but it didn't get there.'

(b) zarakti et ha-sefer **ba**-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.'

(69) (a) sara yarta **la**-matara ve-hexti'a.

S. shot to.the-target and-missed

'Sara shot toward the target and missed.'

(b) sara yarta **ba**-matara #ve-hexti'a.

S. shot to.the-target and-missed

'Sara shot the target # and missed.'

5.3 Prediction III: Disambiguation leads to complementarity

Another prediction following from the distinction between paths and derived goals is that co-occurrence of pronouns and anaphors under the same preposition would be indicative of ambiguity between path and place meanings, and that the interchangeability would disappear when one of the meanings is not accessible.

As stated in Section 4, sentences which allow this variation, like the ones repeated in (70), indeed give rise to two distinguishable meanings, which are illustrated in Figure 1. In each pair, the illustration to the left pictures the meaning of the sentences when the PP denotes a general location, and the one to the right pictures the meaning when the PP denotes a path of motion.

- (70) (a) sara zoreket et ha-kadur {me'al-ea/ me'al acma}
 S. throws ACC the-ball over-her over herself
 'Sara throws the ball over her/herself.'

- (b) sara gilgela et ha-štixim {misviva/ misaviv le-acma}.
 S. rolled ACC the-carpets around.her around to-herself
 'Sara rolled the carpets over her/herself.'

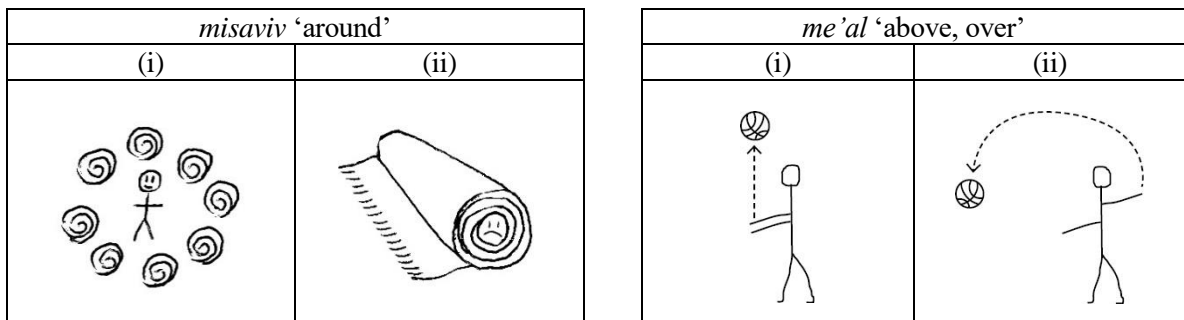


Figure 1: Possible meanings of *misaviv* 'around' and *me'al* 'above, over' in (70)

The same duality is not attested with prepositions like *be-* 'in' or *leyad* 'next to', which cannot give rise to two different interpretations in terms of truth conditions. The sentence in (71), repeated again from (24b), can only describe the outcome pictured in Figure 2.

- (71) sara zarka et ha-kadur {leyad-a/ *leyad acma}
 S. threw ACC the-ball next.to-her next.to herself
 'Sara threw the ball next to her/*herself.'

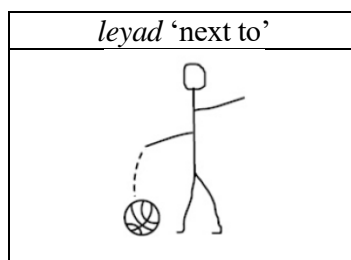


Figure 2: The meaning of *leyad* 'next to' in (73)

The proposed analysis predicts that disambiguating the preposition will result in either the pronoun or the anaphor becoming unacceptable. This can be done through stacking of multiple PPs, which tends to require that the two or more PPs would be of the same meaning type. This is illustrated in (72), where the two place phrases in (72a) can simultaneously describe the location of the sitting event. An additional reading is a reduced relative reading which corresponds to *the park which is in front of the bus station*. Similarly, the two path phrases in (72b) can simultaneously describe the walking event (a reduced relative meaning is impossible because *the park* is not an event). However, in (72c), the path and the place phrase cannot both describe the walking event and only the reduced relative meaning is available.

- | | |
|---|-----------------------------------|
| (72) (a) I set 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] |

The following sentences demonstrate the effect that PP stacking has on anaphor licensing in Hebrew ambiguous prepositions. The sentence in (70a) is repeated twice in (73), 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 strengthens the path and place reading of *me'al*, respectively. In these configurations, the pronoun and the anaphor are not freely acceptable, but rather a reflexive is strongly preferred in the former case and a pronoun in the latter.

- (73) (a) sara₁ zoreket et ha-kadur{??me'ale'a₁/ me'al acma₁}
 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) sara₁ zoreket et ha-kadur ba-avir { me'ale'a₁/?? me'al acma₁ }.

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 the patterns of anaphor licensing is a reliable diagnostics of the presence of path readings. Intuitively, *al* is a place preposition describing a location on the surface of an object. Sentence (74) shows that *al* gives rise to the stative/change of location ambiguity, which is expected of a place preposition which triggers a syntactic ambiguity. However, it is not clear whether Meaning B may also result from a configuration where *al* codes a path of motion toward the stage.

(74) 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 change-of-location reading, the two attested examples in (75) 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 a derived goal and a path reading.

(75) (a) hu₁ zarak al acmo₁ xulca randomalit. (Web examples)

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.'

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 (76) shows that the arrival meaning can be cancelled without causing a contradiction.

(76) sara zarka agvaniot al ha-saxkanim (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 proposed analysis accounts for the distribution of reflexives and pronouns across Hebrew prepositions: Path prepositions are part of the binding domain defined by the verb, and enable local binding by all of its associated arguments; place prepositions project a subject and define an independent domain, whether they merge as complements to the verb or as locative adjuncts. In English, additional logophoric uses of the reflexive are acceptable in place PPs, given that the discourse conditions outlined in Sections 2-3 hold.

6. Conclusion

The paper has shown that the apparent free variation in anaphor licensing across spatial preposition, which is known to be generated by various discourse conditions, hides predictable patterns which follow Binding Theory’s rules of coreference and locality.

Controlling for pragmatic effects by focusing on a language with non-logophoric reflexives like Hebrew, as well as on English inanimate anaphors, was shown to reveal a complimentary distribution of pronouns and anaphors, where subject-oriented coreference is expressed by a reflexive anaphor across path prepositions and a simple pronoun across place preposition. This was shown to be unaffected by the PP’s selection status or its overall meaning, which lead to the conclusion that the distinction is determined at the lexical level, such that place prepositions project an internal subject and path prepositions are interpreted with respect to a higher subject, with the binding domains defined accordingly.

In the absence of logophoric conditions, cases on interchangeability between pronoun and anaphor were shown to be indicative of a lexical ambiguity, where a preposition can denote either a path or place meaning. In such cases, complementarity emerged again when contextual information was used to strengthen one or the other reading of the preposition. The path-place distinction is also expressed in the distribution of result readings, where only place phrases and derived goals generate the meaning of arrival which corresponds with a small-clause constituent regardless of aspectual and contextual factors.

References

- Angelopoulos, Nikos, and Noa Bassel. 2019. "Anaphors in Space: The View from Hebrew and Greek." In *42 Generative Linguistics in the Old World Annual Conference, May 9, University of Oslo (Poster)*.
- Antonenko, Andrei. 2012. "Feature-Based Binding and Phase Theory."
- 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." *Text Representation: Linguistic and Psycholinguistic Aspects* 8 (8).
- . 2008. *Pragmatics and Grammar. In the Series Cambridge Textbooks in Linguistics*. Cambridge: Cambridge University Press.
- Baker, Mark C. 1988. "Incorporation: A Theory of Grammatical Function Changing."
- Bassel, Noa. 2018. "Logophoricity: The Hebrew Perspective." In *Proceedings of the 33rd Meeting of the Israel Association for Theoretical Linguistics (IATL 33). MIT Working Papers in Linguistics* 89, edited by Noa Brandel, 13–32. Cambridge, Mass: MIT press.
- Botwinik-Rotem, Irena. 2008. "Why Are They Different? An Exploration of Hebrew Locative PPs." *Syntax and Semantics of Spatial P* 120: 331–331.
- Bruening, Benjamin. 2013. "By Phrases in Passives and Nominals," no. March: 1–41. <https://doi.org/10.1111/j.1467-9612.2012.00171.x>.
- . 2014. "Precede-and-Command Revisited." *Language*, 342–88.
- . 2018. "Depictive Secondary Predicates and Small Clause Approaches to Argument Structure." *Linguistic Inquiry* 49 (3): 537–59.
- Bryant. 2021. "Location, Location, Location: Anaphor Selection in English Locative Prepositional Phrases." Presented at the LSA 96 annual meeting.
- Büring, Daniel. 2005. *Binding Theory*. Cambridge University Press.
- Canac-Marquis, Réjean. 2005. "Phases and Binding of Reflexives and Pronouns in English." In , 482–502. CSLI Publications Stanford, CA.
- Cantrall, W. 1974. "Viewpoint, Reflexives, and the Nature of Noun Phrases."
- Charnavel, Isabelle. 2019. *Locality and Logophoricity: A Theory of Exempt Anaphora*. Oxford University Press.
- . 2020. "Logophoricity and Locality: A View from French Anaphors." *Linguistic Inquiry*, 1–53. https://doi.org/10.1162/ling_a_00349.
- 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. 1965. *Aspects of the Theory of Syntax*. MIT press.
- . 1981. *Lectures on Government and Binding*. Dordrecht: Foris.
- . 1986. *Barriers (Vol. 13)*. MIT press.
- . 2001. "Derivation by Phase." In *Ken Hale, a Life in Language*, 1–51. MIT Press.
- . 2008. "On Phases." *Current Studies in Linguistics Series* 45: 133–133.
- Comrie, Bernard. 1999. "Reference-Tracking: Description and Explanation." *STUF-Language Typology and Universals* 52 (3–4): 335–46.
- Déchainé, 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. 2010. "On the Functional Structure of Locative and Directional PPs." *Mapping Spatial Pps* 6: 74–126.
- . 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." University 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. Springer.
- Gehrke, Berit. 2008. *Ps in Motion. ... Syntax of P Elements and Motion Events*. LOT, Utrecht.
- Haspelmath, Martin. 2007. "A Frequentist Explanation of Some Universals of Reflexive Marking *," no. October 2004: 40–63.
- Hestvik, Arild. 1991. "Subjectless Binding Domains." *Natural Language & Linguistic Theory* 9 (3): 455–96.
- Hoekstra, Teun. 1988. "Small Clause Results." *Lingua* 74.2 (3): 101–39.
- Horvath, Julia, and Tal Siloni. 2002. "Against the Little-v Hypothesis." *Rivista Di Grammatica Generativa* 27: 107–22.
- . 2016. "The Thematic Phase and the Architecture of Grammar." *Concepts, Syntax and Their Interface*, 129–74.
- 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. John Benjamins Publishing.
- . 2005. "Emphatic and Reflexive-Self: Expectations, Viewpoint, and Subjectivity." Edited by Dieter Stein and Susan Wright. *Subjectivity and Subjectivisation: Linguistic Perspectives*, 55–55.
- Koopman, H. 2000. "Prepositions, Postpositions, Circumpositions, and Particles. Koopman, H.(Ed.) The Syntax of Specifiers and Heads."
- 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. Citeseer.
- Lasnik, Howard, and Mamoru Saito. 1991. "On the Subject of Infinitives." *Proceedings 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.

- Lee-Schoenfeld, Vera. 2004. "Binding by Phase:(Non-) Complementarity in German." *Journal of Germanic Linguistics* 16 (2): 111–71.
- 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.
- Martin, Fabienne, Margaret Grant, Christopher Piñón, and Florian Schäfer. 2021. "A New Case of Low Modality: Goal PPs." In , 30:562–82.
- 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, OM, and Joost Zwarts. 2019. "Tops and Bottoms: Axial Nominals as Weak Definites." In , 270–80. Cascadilla Proceedings Project.
- Neeleman, Ad. 1994. *Complex Predicates*. LED.
- Nikitina, Tatiana. 2008. "Pragmatic Factors and Variation in the Expression of Spatial Goals." *Syntax and Semantics of Spatial P*, 175–95.
- Pantcheva, Marina Blagoeva. 2011. "Decomposing Path: The Nanosyntax of Directional Expressions."
- Piñón, Christopher J. 1993. "Paths and Their Names." In , 29:287–303.
- 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*. Current Studies in Linguistics. MIT Press.
- Pylkkänen, Liina. 2008. *Introducing Arguments (Linguistic Inquiry Monographs 49)*. Cambridge, Mass: MIT Press.
- Quicoli, Carlos A. 2008. "Anaphora by Phase." *Syntax* 11 (3): 299–329.
- Ramchand, Gillian. 2008. *Verb Meaning and the Lexicon: A First-Phase Syntax*. Vol. 116. Cambridge University Press Cambridge.
- Rappaport Hovav, Malka. 2008. "Lexicalized Meaning and the Internal." *Theoretical and Crosslinguistic Approaches to the Semantics of Aspect* 110: 13.
- Reinhart, Tanya, 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 *Discourse Anaphora and Anaphor Resolution Colloquium*, 69–79. Springer.
- Rooryck, Johan, and Guido Vanden Wyngaerd. 2007. "The Syntax of Spatial Anaphora." *Nordlyd* 34: 2–2.
- . 2011. *Dissolving Binding Theory*. Oxford University Press.
- Ross, John. 1970. "On Declarative Sentences." In *Readings in English Transformational Grammar*, 222–72. Ginn, Waltham, Massachusetts: Roderick Jacobs and Peter Rosenbaum.
- 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.

- 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. 1997. "The Parameter of Aspect (Vol. 43)." *Studies in Linguistics and Philosophy*.
- 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." *Nordlyd* 31 (2).
- . 2006. "The Emergence of Axial Parts." *Nordlyd. Tromsø University Working Papers on Language & Linguistics* 33(2006): 49–77.
- . 2007. "Projections of P," 0–16.
- Talmy, Leonard. 1976. "Semantic Causative Types." In *The Grammar of Causative Constructions (Syntax and Semantics 6*, edited by Masayoshi Shibatani, 43–116. New York: Academic Press Talmy.
- Vanden Wyngaerd, Guido. 2019. "Locative-Directional Alternations." In , 7:117–34. Palacký University; Olomouc.
- Wechsler, Stephen. 1997. "Prepositional Phrases from the Twilight Zone" 20 (2): 127–54.
- Williams, Edwin. 1980. "Predication." *Linguistic Inquiry* 11 (1): 203–38.
- Zribi-Hertz, Anne. 1989. "Anaphor Binding and Narrative Point of View: English Reflexive Pronouns in Sentence and Discourse." *Language* 65 (4): 695.