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Understanding the *Self*: How spatial parameters influence the distribution of anaphora within prepositional phrases

Abstract: This paper investigates the distribution of reflexive and nonreflexive pronouns in the prepositional phrase, concluding that multiple semantic factors play a role in the appearance of one pronoun over the other. The distributional trends in English are explained by referencing the crucial role space plays in grammar, and the resulting implications for Binding Theory (Chomsky 1995) are discussed. The motivating forces for the corpus distribution are based on perceived directionality and location of the denoted event with respect to the body of the event's protagonist. The patterns found in the corpus data are attributed to a range of factors that play a role in the semantic specifications and associations of the pronouns themselves. First, it is argued that the high rate of reflexive pronouns in events that are metaphorically located in the body is due to the reflexive pronoun's close semantic association with the concept of self, a metaphorical body-internal entity. Second, it is argued that the reflexive pronoun is used to signal either an event which is performed on the body (in the referent's personal space) or directed toward the body. Cases of these types are explained by a schematic, semantic parallelism between syntactically complex reflexive events and syntactically simple reflexive events. In both cases, the reflexive pronoun signals a contrastive element. In syntactically complex cases, the PP examples (e.g. *John pushed the box toward himself*), and syntactically simple cases, those with basic clause structure (e.g. *John kicked himself*), the reflexive is used to signal that the direction of the event is counter to the direction of expectation, thus explaining why certain reflexive events (e.g. bathe, or pull something toward you) do not have to, and most often, do not occur with the reflexive pronoun.

Keywords: anaphora, pronouns, prepositional phrases, Binding Theory, reflexivity

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1 Introduction

In verbal object position, English reflexive and nonreflexive pronouns exhibit complementary distribution as shown in (1). The reflexive ‘anaphor’, *himself*, can only be coreferential with its clause-mate subject (John) and the nonreflexive pronoun, *him*, can only refer to an event participant outside of the immediate clause (Peter):

- (1) *Peter_j said that John_i loves himself_{i/*j}/him_{*i/j}.*

This grammatical property has been modeled syntactically based on the structural position the pronoun’s referent holds in relation to the pronoun itself within a specified syntactic domain, a phenomenon famously known as ‘binding’ (Chomsky 1995; Pollard and Sag 1992). The structural model of anaphoric distribution, however, becomes problematic when faced with a syntactic environment in which both pronouns appear to be grammatical. A number of authors have pointed out that some prepositional phrases prefer the reflex pronoun, while others prefer the nonreflexive pronoun, as shown in (2–6):

- (2) *Corporal Crump_i pinned the medal beside him_i / *himself_i (on the wall).*
(Wechsler 1997: 15 #39a)
- (3) *Corporal Crump_i pinned the medal onto *him_i / himself_i.*
(Wechsler 1997: 15 #39b)
- (4) *Kragi the robot placed a sandwich in front of him_i / ?*himself_i.*
(Faltz 1977: 106 #3.20)
- (5) *Kragi the robot unscrewed a panel in his abdomen and placed a sandwich inside himself_i / ?him_i.*
(Faltz 1977: 106 #3.21)
- (6) *Johni pulled the blanket over himself_i / him_i.*
(Kuno 1987: 66 #9.18a,b)

In (6), for example, either pronoun is grammatical, and thus apparently in violation of the conditions of Binding Theory exhibited in (1). Examples such as (2–6) have led researchers like Hestvik (1991) and Reinhart and Reuland (1993) to propose that the prepositional phrase itself potentially constitutes a minimal domain, shielding the pronoun from the binding conditions imposed on it in verbal object position. One challenge for these existing syntactic models is that they do not explain what linguistic factors dictate the choice of pronoun for an individual example. Moreover, these models, having to treat all prepositions as equal members of the functional category, must ignore semantic differences among the spatial terms since they are categorically equivalent.

Based on a collection of over 10,000 examples in the *British National Corpus*, I show that the distribution of reflexive versus nonreflexive pronoun is sensitive to the spatial semantics denoted by the individual preposition and its interaction with the described event. I argue that several spatial factors reliably influence anaphoric distribution: directionality, containment, and proximity to the body. The reflexive pronoun has a higher rate of occurrence when the performed action is directed toward the referent as in (7), when the performed action is metaphorically predicated inside the referent as in (8), and when the action occurs close to the referent's body as in (9):

(7) *He_i could have stuck pins into himself_i and it would have taken ten seconds for his body to complain.*

(FSP 2109)

(8) *For a moment Tuan Ti Fo_i closed his eyes, PRO_i seeking that inner stillness deep within himself_i, his lips forming the chen yen – the ‘true words’ – of the mantra.*

(GUG 2486)

(9) *He_i spends all his time hiding, cloaking and padding things around himself_i.*

(CH1 7617)

Building a case against the explanatory power of Binding Theory, I hypothesize that the incorporation of internalized spatial relations into the grammar of language along with a deeper understanding of the lexical properties of pronouns explain the unique dual occurrence of both reflexive and nonreflexive in peripheral syntactic domains and hint at the viability of a non-syntactic analysis of the core anaphoric distribution shown in (1). Because speakers are limited by a finite set of linguistic tools, intended detailed spatial relations are often open to interpretation by the listener; I propose that pronoun choice is actually one more clue to accurate event simulation (in the sense of Feldman 2006).

2 Background: The grammar of anaphora in PPs

Since the introduction of generative syntax, the distribution of English anaphora has been a central issue in the syntactic literature (Safir 2004: 1). Not only has the question of anaphora been the focus of extensive scholarly literature, but the patterning of anaphora in English has also been theoretically linked to syntactic structures involving ‘control’ and ‘movement’ (see Hornstein 1999 and Kayne 2002 for a full account of these connections). The majority of the literature on anaphora refers to the anaphoric element, *himself*, in (10a) as an ‘anaphor’ and the anaphoric element in (10b), *him*, as a ‘pronoun’:

- (10) a. *John_i criticized himself_{i/*j}.*
 b. *John_i criticized him_{j/*i}.*

Built into the term ‘anaphor’ (as opposed to ‘pronoun’) is an assumption that that lexical item is in some way referentially dependent on an antecedent, (syntactically) dependent in a way that a pronoun is not. Because I want to avoid built-in assumptions about identity assignment, I will avoid using the ‘anaphor/pronoun’ distinction and adopt a distinction with its origins in the semantic notion of reflexivity. I will refer to both *himself* and *him* as pronouns, with the former qualifying as *reflexive* and the later *nonreflexive* by default.

‘Complementarity’ refers to the fact that within the VP the reflexive pronoun *himself* can only be interpreted as having the same semantic value as its clause-mate coargument *John*; whereas the nonreflexive pronoun *him* can only be interpreted as finding its reference outside of the clause; the antecedent of *him* cannot be the coargument *John*. Chomsky (1981), based on Reinhart’s (1976) c-command analysis, first proposed principles A and B to capture these structural relations¹: Principle A: A reflexive pronoun must be bound in Domain D (some locally defined domain); Principle B: A nonreflexive pronoun must be free in Domain D (some locally defined domain). Versions of this basic binding theoretical account of the distribution of the core anaphora data have become the standard in the syntactic literature, and within syntactic theory, few if any researchers question the basic principle that anaphoric distribution is based on some type of command relationship (c-command within Chomskyan syntax; o-command in Head Driven Phrase Structure Grammar [Pollard and Sag 1992])².

2.1 Domain D and binding in PPs

The implementation of binding becomes more complicated when a prepositional phrase forms part of the event predicate. The basic principles outlined above don’t capture the distributional patterns. The following four examples (simplified versions of the general trends found in the English corpus data) demonstrate the problem:

¹ *Binding*: X binds Y if X c-commands Y and X and Y are co-indexed. Y is free if either it is not c-commanded by X or it is not co-indexed with X.

² O-command assumes hierarchy a scale of obliqueness relations in which the less oblique argument commands the more oblique argument.

(11) *John_i kept his true feelings within himself_i.*

(12) *John_i felt the anger within himself_i.*

(13) *John_i offered the chair next to him_i.*

(14) *John_i looked for answers within himself_i.*

These four examples represent three different syntactic configurations. In (11), the verb selects for both an NP object and a locative PP. The PPs in (11) is, thus, a syntactic complement (Hestvik 1991). The other examples are argued to involve PP adjuncts adjoined to the NP object; in (12), one interpretation is that *within himself* identifies the location of the anger not the location of the feeling, and in (13), *next to him* unequivocally identifies a particular chair in the room, not the location of the offering event. In (14) the PP is an adjunct too, eliminating it from the sentence does not make the VP incomplete, nor does it change the semantics of the verb. The following bracketing represents the differences just described in a full set of parallel examples with *within* and *next to*:

(15) a. $IP[NP[John_i] VP[kept_{NP[his\ true\ feelings]} PP[within\ himself_i]]]$

b. $IP[NP[John_i] VP[felt_{NP[the\ anger]} PP[within\ himself_i]]]$

c. $IP[NP[John_i] VP[looked\ for_{NP[answers]} PP[within\ himself_i]]]$

(16) a. $IP[NP[John_i] VP[put_{NP[the\ book]} PP[next\ to\ him_i]]]$

b. $IP[NP[John_i] VP[offered_{NP[the\ chair]} PP[next\ to\ him_i]]]$

c. $IP[NP[John_i] VP[looked\ for_{NP[the\ scissors]} PP[next\ to\ him_i]]]$

Because the PP in (16c) is attached outside the VP, the nonreflexive in this example is free within its local domain, the clause. There is no violation of the binding principles. However *John* binds the pronoun located in the PP in (15a,b) and (16a,b) since the VP is considered the local domain for binding. According to Condition B, the nonreflexive pronoun must be free within its local domain, thus examples (16a) and (16b) should be ungrammatical with the reading that the pronoun and *John* are coreferent. The data in (16) suggest, then, that the local domain for binding, when the 'short-distance pronoun' (Tenny 2003: 1) resides in a PP, should not be the VP, but rather a more local domain such as the PP itself.³ This is in fact the analysis proposed in Hestvik (1991), Reinhart and Reuland (1993), Safir (2004), and Buring (2005). If the PP forms its own domain, then the short-distance pronouns in (16) would not be bound within the local domain and these sentences would not be in violation of Condition B.

³ Tenny is most likely referencing the quasi-opposite phenomenon of 'long-distance' reflexives in the creation of this term.

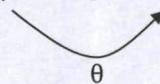
There is an unfortunate consequence to adopting this analytic route. If the PP serves as the local domain for binding in (15a) and (15b), the reflexive pronoun has no local binder unless there is some reason to treat these PPs differently from (16a) and (16b). An unbound reflexive pronoun is in violation of Condition A in the standard Binding Theory. This paradox signals that pronouns in prepositional phrases require either a revision to the standard Binding Theory or some type of amendment to it.

Hestvik (1991) and Büring (2005) amend the standard Binding Theory, arguing that reflexive and nonreflexive pronouns gain their semantic value through different procedural mechanisms. Reinhart and Reuland (1993) and Safir (2004) ultimately abandon the notion that the distribution can be explained by syntactic mechanisms alone. Instead, they concede that examples for which either pronoun is grammatical warrant an explanation from discourse parameters, which function supplemental to the syntax.

Staying true to a syntactic explanation, Hestvik (1991) and Büring (2005) agree that locative and directional PP complements (which receive a theta role from the verb and are syntactically obligatory) form their own syntactic domain; thus allowing the coreferential nonreflexive pronoun to appear as in (17):

- (17) *John_i put the picture_{PP} [behind him_i/himself_i].*

(Hestvik 1991: 463, #11e)



They also agree that the reflexive pronoun in (17) is grammatical and that it is licensed because, in this case, it finds a co-indexed binder, *John*, within the minimal clause. However, Hestvik (1991) and Büring (2005) disagree on the patterning of anaphora in adjunct PPs (which do not receive a theta role from the verb and are not syntactically obligatory) as in (18):

- (18) a. *John_i saw a cat next to him_i/himself_i.*

(Büring 2005: 71 #3.27a)

- b. *??John_i found a dollar bill in front of himself_i.*

(Hestvik 1991: 464 #16a)

- c. *??John_i left Mary behind himself_i.*

(Hestvik 1991: 464 #16b)

Büring treats locative adjunct PPs in the same manner as locative complement PPs: the coreferential nonreflexive is licensed because the PP forms its own

domain, and the reflexive is licensed because it has a co-indexed binder in the minimal clause. Hestvik, on the other hand, disallows the reflexive in sentences such as those in (18). He claims that PP adjuncts form barriers across which the reflexive pronoun cannot find its governing antecedent. Hestvik's model crucially relies on a strict division between PP complements and PP adjuncts.

2.2 Anaphora in Cognitive Grammar

Of course pronominal distribution is not only addressed within traditional syntactic theory, but is also modeled in Cognitive Syntax (Deane 1992) and Cognitive Grammar (Langacker 1993; Van Hoek 1995, 1997). In these theories based on semantic relationships, the complementary distribution of reflexive and nonreflexive is predicated on differing constructional schemas, which authorize their usage. To account for sentences like (10a), Deane (1992: 211) sets up a relational schema structure for prototypical reflexive constructions ("core reflexivization") in which the reflexive and antecedent are predicationally linked to the verb via the verb's semantics (P-linked), and the reflexive is referentially linked (R-linked) to the antecedent, the individual from whose viewpoint we are to interpret the scene named by the predicate. The figure in (19) shows an adapted diagram of Deane's reflexivization schema (1992: 211):

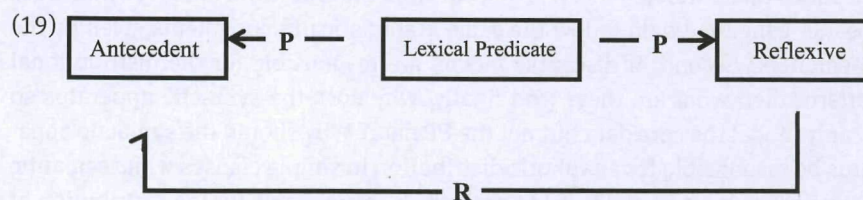


Fig. 1: Adaptation of Deane's (1992) reflexivization schema

The use of the coreferential reflexive in prepositional phrases such as in (15) is presumably analyzed as an extension of the prototype in (19). As Van Hoek (1997:181) argues, following up on Deane's original research, the appearance of the reflexive in examples such as (15) profiles an energistic interaction between the antecedent and the pronoun. Therefore, we can interpret the lexical predicate in Deane's reflexive schema to include information encoded in both the verb and preposition. Alternatively, Van Hoek shows that the existence of the nonreflexive in the same syntactic positions as the reflexive (compare [15] to [16]) signals no

energistic interaction; the PP, in those cases, provides simple backgrounded information about the location of the event. This semantic difference can lead to nuanced divergent interpretations like the one set up in (20):

(20) a. *John_i put the books under him_i.*

(Van Hoek 1997: 181 #16a)

b. *John_i put the books under himself_i.*

(Van Hoek 1997: 181 #16b)

Van Hoek claims speakers of certain dialects of English will interpret (20b) to mean that John is sitting on the books, placed under his body as a booster or for concealment; whereas (20a) will be interpreted to mean John placed the books under a chair, but not in direct contact with his body. Cognitive-based theory introduces alternative semantic parameters that may be dictating the choice of one pronoun over the other – influences on structure not coming from traditional syntactic relationships. These ideas muddy the waters of the clean, clear-cut model offered by traditional syntacticians like Hestvik and Buring.

3 The data: Motivating a corpus-based analysis

That research, which addresses the PP data through a syntactic lens, leaves many questions unanswered. First, it is unclear what the real-world data look like. Does speaker-generated data follow the same grammaticality judgments given by the researchers? Second, if discourse factors are responsible for the distributional pattern, then what are they? And finally, why does the syntactic apparatus so cleanly model the core data but not the PP data? Why should the syntactic apparatus be responsible for anaphoric distribution in simple clauses while semantic factors are at least partially, if not exclusively, responsible for the distribution of anaphora in the PP?

Based on an oppositional scale of adjuncthood, MacDonald (2004) argues that the semantics of the preposition can influence the PP's status on this scale: Specifically, he shows that PPs that denote directionality, Path PPs, tend to be complement-like, patterning differently from non-directional, locative PPs, which pattern more like adjuncts. However, because English spatial prepositions form a closed class of functional heads, the syntactic-based research on the internal semantics of this class has been limited in regard to its effect on anaphoric distribution. (Most syntactic theories (with a few notable exceptions [Svenonius 2004a,b; Tungseth 2003]) do not model the internal semantics of the P head – placing all prepositions in the same category and ascribing differences among

them to external factors such as their node of attachment in the syntactic tree or their functional characteristics in regard to what complements they can or cannot take.)

Like MacDonald, Wechsler (1997: 17) also notes categorical semantic variables that seem to affect the distribution of pronouns. Working in a lexicalist framework, he suggests that English directional prepositions pattern differently from locative prepositions with regard to anaphoric distribution. Sentence (3) shows a directional preposition (*onto*) occurring with the reflexive pronoun, and sentence (2) shows a locative, nondirectional preposition (*beside*) occurring with the nonreflexive pronoun.

This minimal pair indicates that directional prepositions, specifically those which form part of a self-directed action such as *to* and *onto*, pattern with the reflexive pronoun; whereas prepositions that do not lexically imply directionality, such as *behind* and *beside*, pattern with the nonreflexive pronoun.

Idiosyncratic data found in the semantic literature on anaphora suggest a second semantic parameter that may influence anaphoric distribution. When used in contexts that require anaphoric reference, prepositions that denote containment also appear to disproportionately pattern with the reflexive pronoun, as found in Lakoff (1996) in a paper written about metaphors for the self:

(21) *You need to step outside yourself.*

(Lakoff 1996: 99 #17)

These cases involve a metaphorical understanding of the body and mind and isolate another semantic category of prepositions that may influence anaphoric distribution. Taking into account these clues buried in the literature on anaphora, the goal heretofore is to use a substantial body of corpus data to compare how prepositions, representing different semantic classes, pattern in regard to anaphoric distribution.

3.1 Methodology

Prepositional phrases headed by the following prepositions were searched for in the online British National Corpus (see Appendix 1 for detailed description of the BNC's size and content): *next to*, *beneath*, *behind*, *in front of*, *before*, *below*, *above*, *beyond*, *on top of*, *on*, *toward*, *around*, *out of*, *into*, *in*, *inside*, and *within*. The impetus for this specific set of 17 prepositions in English has two explanations. First, the set needs to be large enough for internal comparison across semantic type; that is, the smaller the data set is, fewer are the conclusions that can be

inferred. Second, all the prepositions in this set have at least one sense which is overtly spatial in nature. Unlike the prepositions *to* and *of*, for example, which fall at the functional end of the semantic spectrum (and are often described as semantically inert [as characterized in Buring 2005]), the selected prepositions participate frequently in the description of spatial relations among event participants. The English prepositions were paired with either the 3rd person masculine reflexive or nonreflexive pronoun (*himself* or *him*) or the 1st person reflexive or nonreflexive pronoun (*myself* or *me*).^{4,5}

Data was gathered through roughly sentence-length concordance lines. Sometimes it was necessary to access more context for examples in which coreference was unclear within the sentence alone. For example, in (22), it is initially unclear whether the nonreflexive pronoun *him* refers to the subject, Charles, or to another person:

(22) *Charles drew the bedclothes around him.*

(ACE 3540)

Accessing a larger chunk of textual context reveals that the nonreflexive pronoun is in fact coreferent with the subject:

3535 *Officers sat on the balustrade with their brandy and cigars after dinner, watching the anti-aircraft batteries around Lille piercing the night sky with brilliantly coloured tracer shells.*
 3536 *"Sir! sir! 3537 Wake up, sir!"*
 3538 *"Go away. 3539 It's the middle of the night."*
 3540 *Charles drew the bedclothes around him.*
 3541 *He could hear the dawn chorus in full concert, and when he opened his eyes unwillingly light was filtering faintly through the curtains.*

The scene described in the paragraph of text is compatible with a semantic reading that *him* refers to Charles, not to a different referent, especially since no such possible referent is mentioned in the larger selection of text.

⁴ Plural pronouns (*them*, *themselves*, *us*, *ourselves*) were not collected as spatial semantics are trickier to code for with plural referents; the 3rd person feminine pronouns (*her*, *herself*) were also not collected in order to limit the data, which already totals over 10,000 examples (all hand coded).

⁵ Separating 1st and 3rd person categorically helps investigate how perspective marking plays a role in anaphoric distribution. This paper will not address these differences; however, Lederer (2009) includes a lengthy discussion of the topic.

3.2 Coding

Data was coded using a system of manual tagging (Meyer 2002: 111). Before tagging the data into different semantic and/or syntactic categories, concordance lines were filtered to include only that data relevant to the research questions: cases where the coreferential pronoun refers back to the subject of the clause in which it is contained. Quite frequently the subject of the clause is not overt in the text but rather identified in a preceding clause; for coding purposes only, the convention PRO was used in this scenario. (PRO represents a phonologically null pronoun; thus, in the data, PRO was inserted before overtly subjectless verbs for ease of reference in coding coreferential relationships among pronouns.⁶) Following standard syntactic practice, subscripted letters were used to mark two clause participants as either coreferential or noncoreferential. The following example shows indices marking as well as the marking of PRO:

- (23) *He_i failed to notice the borrowed things that the girls wore, PRO_i looking around him_i instead in dumb bafflement: it was a wedding day, a shining moment in his life, and, except for the dressed children, it could be any ordinary day.*

(A6N 1071)

In this example, the subject of *looking* is not overtly stated in the text; thus, 'PRO' represents the subject and is marked with the subscripted indices to clarify the referential relationship it shares with the pronoun in the prepositional phrase. The judgments were supported by the semantics of the scene described in the text. Sentences in which the pronoun's reference remained ambiguous, even when surrounding text was consulted, were coded as such and eliminated from the analysis.

Because only examples in which the subject of the clause is coreferential with the pronoun in the PP are of interest, examples such as (24) were eliminated from the corpus:

- (24) *I_j shut the door behind him_i and locked it.*

(A08 3108)

⁶ I do not advocate the idea that PRO is a psychologically real, phonologically null pronoun. I use it only for ease of reference identification in the written corpus material.

In all remaining examples, the pronoun, either reflexive or nonreflexive in the event-modifying PP, refers back to the subject of the clause, with four categorical exceptions to this norm. First, “long-distance” reflexives in PPs were eliminated; these are constructions in which the reflexive pronoun does not have a clause-mate antecedent as in (25):

- (25) *Of all George_i went through in his Beatle days, there was this kind of commitment within himself_i to say “I really want to see you”.*

(CBC 7906)

Secondly, reflexive pronouns whose antecedent is the object of the verb as in (26) were eliminated:

- (26) *We are counting on you to take him_i out of himself_i.*

(FU6 1414)

Examples in which the prepositional phrase is unmistakably modifying the location of the object of the action, not describing the location of the event denoted in the clause, were also eliminated. Syntactically, the PPs in these examples are unmistakably adjuncts to the NP object of the verb as in (27):

- (27) *Cziffra_i only occasionally succumbs to that particular devil within him_i but, when he does, it can be either disastrous, as in the middle section to the slow movement of Tchaikovsky’s First Concerto, or it can miraculously work, as in Beethoven’s “Rage over a Lost Penny”, where an unexpected surge of tempo cannot fail to take his listeners with him.*

(BMC 2450)

However, within many predicates, it is often unclear if the PP in a particular example is denoting the location of the object of the event or the event itself; this ambiguity can be seen in (28):

- (28) *He_i “felt a surge of patriotic emotion within him_i” but almost at once he “incontinently began to analyse his wave of emotion and to wonder how much of it was due to the romantic beauty of his surroundings”.*

(EC8 504)

In (28), one interpretation is that the PP *within him* is modifying the location of the emotion, the emotion is located within the referent. However, it is also possible to interpret the PP as designating the location of the event of feeling; it is the

whole event of feeling that is located within the referent not just the particular emotion. Ambiguous cases such as these were included in the main corpus, as at least one interpretation fit the targeted syntactic structure.

Finally, phrasal verbs were excluded from the final data set. The preposition in the phrasal verb is unique to the phrasal verb, forms part of a unique semantic structure, and is not exchangeable with another preposition. As in (29–30)⁷:

(29) *He_i has total faith in himself_i that what he set out to do, he will achieve.*

(HUB 786)

(30) *Mike_i took a grip on himself_i.*

(CMJ 273)

Phrasal verbs pattern identically to regular verbs in regard to anaphora. That is, the pronoun object of the particle in the phrasal verb is the target of the event denoted by the verb-preposition combo.

By removing these four categorical exceptions, a functionally distinct group of data emerges. In this data, the prepositional phrase, whether it is a syntactic argument or a syntactic adjunct, semantically marks the location of the event denoted in the VP.

4 Findings: A Macro-semantic analysis of spatial factors

Table 1 shows the number of examples of reflexive and nonreflexive pronouns that appear within the prepositional phrase headed by each preposition.

Some preposition-pronoun combinations have low counts but do indicate strong preferences for one pronoun over the other as shown in Figure 2, where the prepositions at the top of the list strongly favor the reflexive pronoun, and those at the bottom strongly favor the nonreflexive.

The distribution is clearly not equal among the 17 prepositions; varying widely, some prepositions such as *next to*, *beneath*, *behind*, and *in front of*, almost exclusively pattern with the nonreflexive pronoun and other prepositions such as

⁷ The examples put into this category passed multiple syntactic tests used to categorize prepositions as part of phrasal verbs, including Buring's (2005) deictic adverb test for phrasal verbs, lexical replacement with a single verb such as *have confidence in* = *trust* (Lindstromberg 1998: 248), and fronting: if the PP in question can be fronted to the beginning of the sentence, then the verb-PP sequence is not labeled a phrasal verb, but if the PP cannot be fronted, such as **On him, I am counting* _____ (Lindstromberg 1998: 249).

Table 1: Counts of pronoun distribution according to head preposition

Preposition	Nonreflexive	Reflexive	Total
next to	5	0	5
beneath	24	0	24
behind	593	2	595
in front of	130	2	132
before	58	4	62
below	5	2	7
above	16	11	27
beyond	1	4	5
on top of	4	2	6
on	73	41	114
toward(s)	129	5	134
around	176	23	199
out of	0	13	13
into	0	37	37
in	97	81	178
inside	36	21	57
within	18	54	72
Total	1365	302	1667

into and *out of* show no examples with the nonreflexive.⁸ These proportional differences group into three statistically significant categories (Marascuillo's Procedure [$\alpha = .05$]). Group one prepositions (*next to*, *behind*, *in front of*, *before*, *below*, *above*, *beyond*, *on top of*, *toward[s]*), pattern almost exclusively with the nonreflexive; prepositions in group two (*on*, *around*, *in*, *inside*) pattern with both; and those in group three (*out of*, *into*, *within*) highly prefer the reflexive pronoun. The statistical groupings somewhat mirror the differential distribution we see when semantically similar prepositions are combined into groups based on their image schema properties. Figure 3 shows that prepositions which denote containment and especially containment along with directionality prefer the reflexive

⁸ Since I am evaluating the data through frequency counts, the numbers need to be understood within the context of the larger picture of anaphoric distribution. The individual distributions examined should be interpreted against a backdrop of asymmetrical frequency between the nonreflexive and reflexive pronouns in the English language as a whole. If we look to the BNC for a representation of total frequency difference between all uses of the 1st and 3rd person nonreflexive and reflexive pronouns, *him*, *me*, *himself*, and *myself* (both coreferential and not; in all syntactic contexts), we find that the nonreflexives are overall much more frequent in usage than are the reflexives. The nonreflexives, *him* and *me*, combine to get 284,105 total hits (87.4%) compared to the reflexives, *himself* and *myself*, which combine to get 40,988 total hits (12.6%)

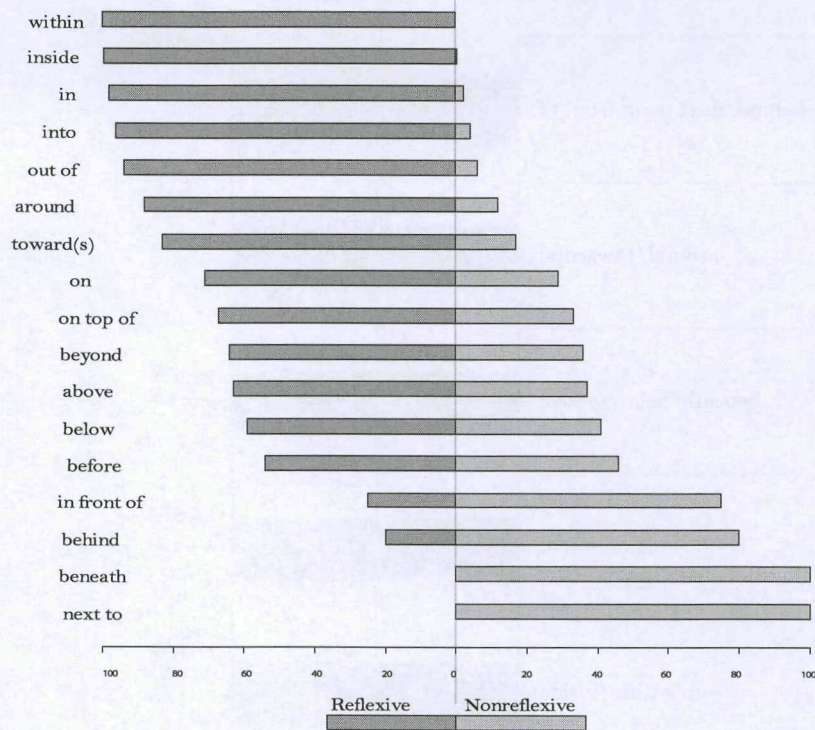


Fig. 2: Percentages of pronoun distribution according to head preposition

pronoun, prepositions that reference horizontal locations around the referent prefer the nonreflexive pronoun, and prepositions that encode other types of spatial categories including verticality allow both.

4.1 Findings counter a syntactic model: Complements vs. adjuncts

The most coherent argument in the syntactic literature is that the PPs which function as syntactic arguments should require the reflexive pronoun; whereas the PPs which function as syntactic adjuncts should require (Hestvik) or prefer (Büiring) the nonreflexive pronoun. For examples in which the PP encodes the spatial semantics of the verb-denoting event, argument/adjuncthood is tested for via the semantic parameter of optionality (Grimshaw 1990); that is when the PP forms part of the event-internal semantics (when it is “theta-marked by the pred-

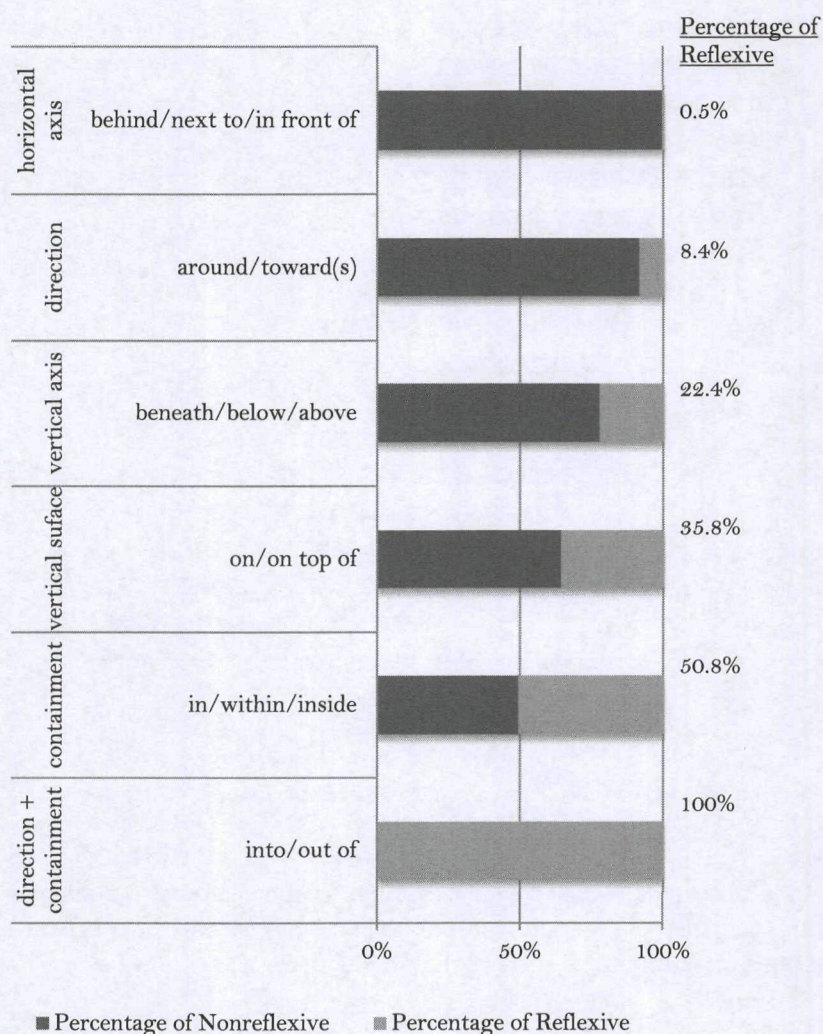


Fig. 3: Percentages of pronoun distribution according to lexical categories of head prepositions

icate as a function of the predicate's argument structure" [Grimshaw 1990: 108]), it is labeled an argument; however, when the PP serves more as a scene-setting descriptor (not theta-marked by the verb), easily replaced with a different PP (without changing the verbal semantics) or left out of the sentence entirely, it is labeled an adjunct. Based on these standard divisions, all of the following sentences (31–36) would be categorized as having PP adjuncts; however, both pronouns are easily found within this syntactic context:

- (31) *As he looked at them walk away, something hard in him revolted and **he_i cried inside himself_i**.*
(A7J 121)
- (32) *Jack could see hard frost gleaming on the windows and **he_i could feel the bleak coldness of the beds inside himself_i**.*
(BPD 2898)
- (33) ***He_i was smiling, but holding a gun out in front of him_i**.*
(HTY 2134)
- (34) *He_i rushed from the cell, **PRO_i shutting the door behind him_i**.*
(FAB 3273)
- (35) ***He_i put the opened bottle down next to him_i** and smelled the top.
(CA3 641)*
- (36) *Another – ; and this is one of the most perfect sights in all cycling – ; is the silken action of one of those men **who_i can sit perfectly still, hands lightly on top of the handlebars, and spin his legs beneath him_i** as though their motions came from a quite different source of power.*
(B35 401)

The difference among (31–36) is not syntactic but rather semantic: examples (31–32) contain prepositions which denote containment, whereas (33–36) do not. Similarly, the examples in (37–40) would be classified as containing PP arguments, yet both pronouns are readily found in this syntactic context contrary to both Hestvik and Büring's analyses:

- (37) ***He_i could have stuck pins into himself_i** and it would have taken ten seconds for his body to complain.*
(FSP 2109)
- (38) *He_i fell silent, **PRO_i looking into, himself**.*
(H84 2873)
- (39) ***He_i gazed around him_i** at the late afternoon sky.
(HWA 97)*
- (40) ***He_i gathered his own particular circle of close advisers around him_i** and was prone to discount views that did not reflect those prevailing in his own circle.*
(EDP 1205)

Examples (39) and (40) are in violation of the supposed syntactic constraint against nonreflexives in argument PPs.

At this point, further discussion of an argument/adjunct distinction will be put on hold. There is good reason to believe that a semantic version of the syntac-

tic notion does contribute to the distribution of anaphora, but by its pure syntactic definition, this categorical boundary is not a good predictor.

If argument- or adjuncthood does not serve as a good predictor variable, then what categories do make a difference in the distribution?

4.2 Semantic parameters: Containment

Faltz (1977) inadvertently implicates ‘containerhood’ as a potential semantic influence on pronoun distribution with the following author-generated examples:

(41) *Krag_i the robot placed a sandwich in front of him_i/?*himself_i.*
(Faltz 1977: 106 #3.20)

(42) *Krag_i the robot unscrewed a panel in his abdomen and placed a sandwich inside himself_i/?him_i.*
(Faltz 1977: 106 #3.21)

He argues that the reflexive pronoun seems more grammatical after the container preposition *inside* than it does after the noncontainer preposition *in front of*.

This intuition is confirmed in the BNC data: prepositions which denote containment (*in, inside, within, into, out of*) much more readily allow for the reflexive pronoun and in some instances seem to prefer it. In fact, through a calculation of the risk ratio (Agresti 2007: 27), we can conclude that the reflexive is six to nine times more likely to be found in these prepositional phrases than in the non-container prepositional phrases (95% confidence interval for the relative risk, $rr = p_1/p_2$ is [6.37, 9.73]).⁹ By default, all the cases in the corpus with a container preposition reference the human body as a metaphorical (and in very few cases literal) container as illustrated in (37) and (38) and here in (43):

Container Prepositions

(43) a. *He_i remembered sitting at his desk in the bothy before Bicker arrived, **PRO_i trying to tear the story out of himself_i** and filling pages with blizzards and killing.*

(GWF 1208)

⁹ Total Counts: container preposition: 206 reflexives; 151 nonreflexives; noncontainer prepositions: 96 reflexives; 1214 nonreflexives. The estimates for relative risk for p1 is 206/(206 + 151) and estimate for p2 is 96/(96 + 1214); the rr estimate is 206/(206 + 151)/(96/(96 + 1214)).

- b. *In the last chapter, in prison, he says that without the crime **he_i would not have found within himself_i** such questions, desires, feelings, needs, strivings, and development.*
(A18 201)
- c. *This extraordinary man, explorer, farmer, writer and mystic, taught **Charles_i to seek the depth and strength within himself_i**, to use the experience of Mounthatten's death, to use the suffering and learn from it: to grow in the spiritual sense; and above all, to ensure that his great-uncle had not died in vain.*
(A7H 295)
- d. ***The researcher_i who is really at home as one of the natives must seek inside himself_i** to create his 'remote areas'. (E. Ardener 1987).*
(AOK 81)
- e. *And it illumines too the politics of personal relations: the vital fabric of social life that exists in the silence between people – ; exactly that space which is filled by music: 'As the person talked to me in a conventional conversation, I knew, I heard that, **inside himself_i, the person_i, perhaps wept.***
(A35 167)
- f. *As he looked at them walk away, something hard in him revolted and **he_i cried inside himself_i.***
(A7J 121)
- g. *Jack could see hard frost gleaming on the windows and **he_i could feel the bleak coldness of the beds inside himself_i.***
(BPD 2898)

In each example the protagonist's body serves as a landmark for some type of event (usually metaphorical), which occurs inside of it. Sentences (43b,e,f) refer to emotions, which occur inside the body. Sentences (43b,c,d) evoke the notion of self-introspection; the metaphorical idea that a person can look for certain truths stored within his interior.

In all the corpus data with container prepositions, the protagonist is understood as a container, which houses his subjective self, his consciousness, and it is this metaphor, in fact, that explains the greater use of the reflexive in these contexts. The metaphorical conception that humans house internal divisible parts of the self is not unique to present history, nor English for that matter. For example, the metaphor shows up in Freud's 1923 theory of the *Id*, *Ego*, and *Superego* (Freud 1986: 450). In the cognitive literature this metaphor is referenced as the "Divided Person Metaphor" (Lakoff 1996: 100) or the "Divided Self" conceptualization (Talmy 2000: 431) outlined in (44):

(44) **The Divided Person Metaphor****Mappings:**

- a. A person is an ensemble (containing one person, the Subject, and at least one other entity, a Self).
- b. The experiencing consciousness is the Subject.
- c. The bodily and functional aspects of a person constitute a Self.
- d. The relationship between Subject and Self is spatial: the Subject is normally either inside, in possession of, or above the Self.

(Lakoff 1996: 100)

Apart from the examples with container prepositions, other, even more explicit examples of the metaphor are readily found in the BNC data, shown in (45). In (45a,b), the Subject, the referent's judgment and consciousness, is predicated to be above the Self, the referent's 'real-world' status, yielding an idiomatic meaning that the referent is conceited. In (45c), the referent's Subject, his consciousness, is predicated to be either inside of outside of his Self, his brain/body, yielding a meaning in which the referent is able to both understand his own actions internally and external perspective:

- (45) a.
- He_i was getting above himself_i.*

(FRF 2884)

- b. *With a face like that he_i would naturally be constantly above himself_i, and he wasn't English, that was for sure.*

(HGK 63)

- c. *He was at an age when he_i could be both inside himself_i and outside himself_i at the same time: he knew he was only playing a game, but the game still remained real to him.*

(HH9 2452)

As Lakoff suggests, in each case in (45), the reflexive pronoun cannot be construed as containing the exact same semantic value as its antecedent. (This inequality provides evidence for the argument that coindexation should be used as a formal tool for imprecise, basic identity relations only, not as an indicator that coindexed elements are exactly the same.) In this type of construction, a metaphorical spatial relationship is set up between the two parts of the self. The reflexive pronoun is required to maintain the interpretation that both aspects of the self match the same human referent. These examples are similar to the 'proxy' use of the reflexive pronoun in which two separate referents share the same identity as in (46):

(46) *Ringo_i (the man) fell on himself_i (the statue).*

Just as the reflexive is needed in (46) to assert identity between a human referent and a proxy, the reflexive is needed in (45) in order to assert identity between the Subject and Self of the human referent¹⁰. For this reason the reflexive pronoun is obligatory in these cases. If *him* were substituted for *himself* in (45a), for example, the coreferential construal is eliminated. *Him* must refer to a second party:

(47) *He_i was getting above him_i.*

These examples of a divided self, such as (45a), parallel Reinhart and Reuland's semantically reflexive P-predicates in (48):

- (48) a. **Max rolled the carpet_i over it_i.*
 b. *Max rolled the carpet_i over itself_i.*

(Reinhart and Reuland 1993: 689 #67)

Although the syntax of the examples in (45) is different from the examples in (48) (the antecedent in (48) is the direct object of the verb, whereas the antecedent in (45) is the subject), the metaphorical (45) and literal (48b) spatial relationships are the same. In both cases one aspect of the referent is construed as separated from the other aspect. The carpet as a whole is construed as multiple entities, with one part on top of the other, and the person as a whole is construed as multiple entities with one part of the self above the other. This data suggest that the reflexive pronoun itself is associated with the activation of a metaphorical understanding of the divided person.

This association may come from the lexical semantics of the reflexive pronoun. The reflexive pronoun in English contains the word *-self* within it and is derived from the word *self* (König and Siemund 2000). Quite frequently, cross-linguistically, reflexive pronouns derive from words referencing the mind or body. In his cross-linguistic analysis of reflexivity, Faltz (1977: 31) explains:

¹⁰ The following distinction is noted by a reviewer: (45a) and (46) are dissimilar in one respect: in (46) (*Ringo fell on himself*), the "real" self is Ringo, the man (antecedent), and the reflexive pronoun *himself* refers (metonymically) to a sculptural representation of Ringo. In contrast, in (45a) the normal self is the referent of the reflexive pronoun and the antecedent refers to a somewhat "deviant" self, the conceded self in this case.

In some languages with head reflexives, the reflexive nominal stem is identical to some ordinary noun stem, suggesting that the ordinary noun has been impressed into special service as a reflexive head. Commonly found used in this way are noun roots meaning “body”, “soul”, and “head”.

Although the English reflexive forms have a diachronic link to *self*, the reflexive pronouns nowadays are often referenced in the literature as ‘semantically vacuous’ markers of reflexive actions (Hellan 1988) or ‘empty’ lexical items that receive their semantic input solely from their syntactic binder (Hestvik 1991). However, two different types of evidence below suggest that the reflexive pronouns in English have a synchronic semantic connection to *self*.

Psycholinguistic research over the past several decades indicates that the mental lexicon is structured via various forms of lexical fields (Aitchison 1994: 90; Langacker 2002: 56), in which both semantically and phonologically related word representations are linked via neurological connections (Feldman 2006). It may be the case that, in a neural connectionist framework, reflexive pronouns of the form *-self/-selves* share a close and strong connection to the word *self*. Evidence for this synchronic connection is shown below; the word *self* often appears in the same syntactic and semantic context as the reflexive pronoun. Texts found in the BNC demonstrate that speakers blur the line between the reflexive pronoun and the possessed self:

(49) *Hm, said her friends, and hmmm said Jay herself to **her self** when she was alone.*

(AOL 1396)

(50) *She felt every one of her thirty some years sitting on her face, and stared at this disoriented stranger, **her self**.*

(AOL 3276)

(51) *I was happy in London, free, mistress of **my self** and my pocket. Here it was impossible not to be happy.*

(AOU 1562)

In (49–51), the possessive pronoun is orthographically separate from *self*, indicating that the self should be understood as a separate entity from its possessor; however, replacing the D-N structure with the reflexive pronoun does not significantly alter the semantics of these examples, because, as argued, the reflexive pronoun includes the semantics of a possessed self as it shares a close semantic connection with the individual word *self*.

Evidence from African American English (AAE) also hints that the *-self* input of the reflexive pronoun is both morphologically and semantically separable from

the preceding pronoun. Reflexives in AAE can be syntactically separated and internally modified by an adjective as well as quantified with *all*. Based on the following examples, Pycha et al. (2005) argue that reflexives in AAE behave more like [[pronoun][NP]] structures¹¹:

- (52) a. *they buy their own stuff an' provide for **their own self**.*
 (Pycha 2005: 6 #25a)
- b. *I guess ih's more real 'cause you, you, you 'on', you showin' **your real self**.*
 (Pycha 2005: 6 #25b)
- c. *You know, but you should definitely be **your reg'lar self**.*
 (Pycha 2005: 6 #25c)
- d. *your frien' make comments like, um, "Shut **your little boney self** up." or sum'in like that.*
 (Pycha 2005: 6 #25d)
- (53) a. *Like they trying to put **all theyself** on they boyfriend.*
 (Pycha 2005: 6 #26a)
- b. *you sat there an' worked **all yourself** up thinkin' tha' tha' was the person an' it wasn't.*
 (Pycha 2005: 6 #26b)

It's clear that in (52b–c) and (53b), *-self* refers to the inner character of the referent, *-self* is not semantically vacuous, and yet, the distribution of these modified reflexives is no different from the typical use of a regular reflexive pronoun.

Returning to Krag, the robot in (41–42), an explanation for Faltz's judgment emerges. Both PPs are syntactic arguments and of the same verb, re-confirming the fact that syntactic argument/adjuncthood is not a good predictor of pronoun distribution. We can now speculate that (42) sounds more natural to Faltz with the reflexive pronoun because the Divided Person, or in this case, Divided Robot, understanding is active. Krag is understood as a human like entity whose body demarcates an interior and exterior boundary. Since the reflexive pronoun is linked to the self, housed in the interior of the body, its use with body-internal predication is natural in (42). On the other hand, in (41), there is no mention of Krag's interior, no evocation of the Divided Person metaphor; the reflexive sounds unnatural in this context because the Divided Person metaphor is not evoked.

Additionally, this quasi-minimal pair highlights the spatial underpinning of the divided person construal. In this case, because Krag is a robot, the interior

¹¹ This type of reanalysis can be closely tied to the use of *hisself* versus *himself* in AAE.

of the protagonist serves as a literal spatial predication. In the cases from the BNC data, the body-internal predication is metaphorical. Nevertheless, even the metaphorical predication of the corpus data sets up a spatial relationship between the protagonist (external and internal) and the entity on which he is acting (internal).

4.3 Semantic parameters: Peri-Personal space

In his detailed semantic analysis of reflexivity, Kuno (1987) addresses cases of anaphora in the PP, which allow for either the reflexive or nonreflexive pronoun as in (54):

(54) a. *John_i pulled the blanket over himself_i.*

(Kuno 1987: 66 #9.18a)

b. *John_i pulled the blanket over him_i.*

(Kuno 1987: 66 #9.18b)

Kuno argues that the use of the reflexive in (54a) implies that John is more affected by the event than he is when the nonreflexive is used in the same position. Kuno's intuitions may, in part, be explained by a spatial parameter.

The term *peri-personal* space refers to the motor space around the body in which the body's effectors (hands, arms, feet and head) freely move during action events (Gallese and Lakoff 2005). Thus, peri-personal space can be understood as a region of space around the body whose outer limits are defined by the distance one can extend the body's limbs to perform an action. Actions occur at locations, and Gallese and Lakoff (2005) demonstrate that the semantic relation between an action and its location is part of a conceptual structure which is characterized neurally by specific firing relations (for more explanation and a summary of the "mirror neuron" phenomenon see Feldman 2006: Chapter 13). Hence, the region around the body defined as peri-personal space forms a neurologically recognized and encoded spatial category.¹² Example (55) illustrates an action performed within the referent's peri-personal space:

¹² The spatial parameter of peri-personal space may be the neural basis for the abstract notion of *personal sphere* (Dabrowska 1997: 17), which comprises the "persons, objects, locations, and facts sufficiently closely associated with an individual that any changes in them are likely to affect the individual as well." Dabrowska applies this notion to understand the use of the dative in Polish.

- (55) *He_i spends all his time hiding, cloaking and padding things around himself_i.*
(CH1 7617)

Whereas, example (56) shows an event that is most likely not construed as occurring within the referent's peri-personal space:

- (56) *He_i gathered his own particular circle of close advisers around him_i and was prone to discount views that did not reflect those prevailing in his own circle.*
(EDP 1205)

Apart from its status as a nonlinguistic spatial category, there is ample linguistic evidence to treat peri-personal space as a spatial category to which the grammar is sensitive. The reflexive clitic in Spanish is one such example. Maldonado (1999) discusses several examples of the reflexive clitic *se* in which its use is related to the so-called 'dative of possession'. These cases occur when the reflexive clitic is used for verbal actions which are performed on the body or on inalienable objects as in (57):

- (57) *Se lavó los dientes.*
Refl. wash-past-3rdP the teeth
'He brushed his teeth.'

In (57), the teeth are considered an inalienable part of the body and so the verb must appear in its reflexive form, with the reflexive clitic. However, if the object of the verb is alienable, and not part of the body, such as the car in (58), the non-reflexive verb is the only grammatical choice:

- (58) *Lavó el carro.*
wash-past-3rdP the car
'He washed the car.'

The use of the reflexive in (57) is related to another category of reflexive use in which the reflexive clitic indicates that the object of the action is located on the Initiator (Maldonado 1999: 183) of the action. These examples are particularly interesting because the parameter of alienability is neutralized. The following minimal pairs demonstrate this difference:

- (59) a. *Doña Maru guardó el cambio.*
 Doña Maru put-away-past-3rdP the change
 'Doña Maru put away the change.'
 (Maldonado 1999: 183 #135a)
- b. *Doña Maru se guardó el cambio.*
 Doña Maru refl. put-away-past-3rdP the change
 'Doña Maru put away the change.'
 (Maldonado 1999: 183 #135b)

The example in (59a) without the reflexive clitic can mean that Doña Maru put the money in her drawer or in her closet, whereas in (59b) the only reading possible is that of Doña Maru putting the money directly into her pocket. The same contrast is represented in the following pair of sentences in (60):

- (60) a. *Mari Carmen guardó el boleto en la bolsa del pantalón*
 Mari Carmen put-away-past-3rdP the ticket in the pocket of the pants
 'Mari Carmen put the ticket away in the pants' pocket.'
 (Maldonado 1999: 183 #136a)
- b. *Claudia se guardó el boleto en la bolsa del pantalón*
 Claudia refl. put-away-past-3rdP the ticket in the pocket of the pants
 'Claudia put the ticket away in her pants' pocket.'
 (Maldonado 1999: 183 #136b)

The interesting contrast is that (60a) presupposes that *Mari Carmen* isn't wearing the pants; whereas, because of the reflexive *se*, the only possible reading in (60b) is that *Claudia* is wearing the pants. Maldonado explains that the notion of proximity presupposes the presence of containment and control on the part of the subject.

A further example illustrates this idea. In (61), the object is not only within the subject's control, but the subject's body demarcates and restricts the placement of the object:

- (61) *En Los siete samurais, Toshiro Mifume se (*Ø) saca una bala*
 In *The seven samurais* Toshiro Mifume refl. pull-out-pres.-3rd from-
del brazo con los dientes.
 the arm with the teeth
 'In The Seven Samurais, Toshiro Mifume pulls a bullet out of his arm with his teeth.'
 (Maldonado 1999: 184 #137)

In (61), the absence of *se* would make the sentence ungrammatical. It is clear from these examples that Spanish speakers have extended their understanding of reflexivity to encompass situations in which there is a very close spatial connection between event participants and the objects they manipulate; the reflexive clitic is used when the actor's body is identified as the landmark for the action and the trajector remains within the peri-personal space of the human landmark, and it is the grammar that conveys these spatial semantics with the addition of the reflexive clitic.

If the same semantic connection between the reflexive marker and peri-personal actions holds for English, then one would expect to find a higher rate of reflexive pronouns in contexts which encode an action performed within the referent's peri-personal space than in contexts which encode an action performed outside of the referent's peri-personal space.¹³ This hypothesis is confirmed in the BNC data: The reflexive is roughly two to four times more likely to be found when the event occurs within the referent's peri-personal space than outside of this region (95% confidence interval for p_1/p_2 is [1.65, 3.9])^{14,15}. (Note that the *nonreflexive* is still used more often even when the action is performed in the referent's peri-personal space (hence giving an explanation as to why Faltz judges the nonreflexive to be grammatical in [41]). The important distinction I want to highlight is the relative use of the reflexive pronoun: the fact that it is used *more often* in an in-peri-personal space construal than in an out-of-peri-personal space construal.)

Returning to Kuno's examples in (54) and others below, we can now suggest that peri-personal space provides a spatial explanation for Kuno's semantic notion of affectedness.

¹³ Note that examples coded as in the referent's peri-personal space excluded container examples in which the referent's body is understood as a metaphorical container. Thus, the examples discussed here involve actions that are performed outside the body but within the immediate vicinity of the body.

¹⁴ Many examples were concluded to be indeterminate as to whether they fit one of the two categories and were thus eliminated for the overall count. For example in (i), it is unclear if John is looking for the keys near his body or farther away on the floor:

(i) *John looked in front of him for the keys.*

¹⁵ Total counts: inside the referent's peri-personal space: 59 reflexives; 364 nonreflexives; outside the referents peri-personal space: 28 reflexives; 482 nonreflexives.

- (62) a. *John_i put the blanket next to himself_i.*
(Kuno 1987: 66 #9.19a)
b. *John_i put the blanket next to him_i.*
(Kuno 1987: 66 #9.19b)
- (63) a. *John_i put the blanket under himself_i.*
(Kuno 1987: 66 #9.20a)
b. *John_i put the blanket under him_i.*
(Kuno 1987: 66 #9.20b)
- (64) a. *John_i pulled the rope toward himself_i and won the game.*
(Kuno 1987: 66 #9.21a)
b. *John_i pulled the rope toward him_i and won the game.*
(Kuno 1987: 66 #9.21b)
- (65) a. *John_i strung the rope around himself_i.*
(Kuno 1987: 67 #9.23a)
b. *John_i strung the rope around him_i.*
(Kuno 1987: 67 #9.23b)
- (66) a. *John_i spilled gasoline all over himself_i.*
(Kuno 1987: 67 #9.24a)
b. *John_i spilled gasoline all over him_i.*
(Kuno 1987: 67 #9.24b)
- (67) a. *John_i poured the gasoline all over himself_i.*
(Kuno 1987: 67 #9.25a)
b. *John_i poured the gasoline all over him_i.*
(Kuno 1987: 67 #9.25b)

In (63a), Kuno would argue that John is more affected by the event of pulling the blanket than he is in (63b); the blanket would be interpreted as covering more of John's body with the reflexive than with the nonreflexive. A different way to characterize Kuno's semantic intuitions is to reinterpret them through the lens of peri-personal action construal. Kuno's examples with the reflexive pronoun may be focusing the close spatial relationship between trajector and landmark (Langacker 2002) to a level that is not achieved with the use of the nonreflexive pronoun. All the events in (62–67) can be interpreted as occurring within John's peri-personal space, but if the reflexive pronoun is used, the event *must* be understood as taking place within the referent's peri-personal space. This inference can be teased out of the data in two ways. First, it is shown in (68) that the nonreflex-

ive pronoun is natural in a scenario in which the action and object are distanced from the referent's body:

- (68) *John had to perform an enormous feat in order to win the money. First he was locked in the cage; then the rope was placed outside the cage. He was instructed that he had to form a circle around the cage with the rope. Somehow John_i managed to string the rope around him_i, so that it lay in a circle shape outside of the cage.*

The nonreflexive does not imply that the action is performed in the referent's peri-personal space. Because the reflexive does implicate a within peri-personal space construal, it sounds unnatural in the same scenario in (69):

- (69) *John had to perform an enormous feat in order to win the money. First he was locked in the cage; then the rope was placed outside the cage. He was instructed that he had to form a circle around the cage with the rope. Somehow John_i managed to string the rope around ??himself_i, so that it lay in a circle shape outside of the cage.*

In (69), the use of the reflexive triggers an event simulation (in the sense of Bergen 2005) in which John is tying the rope around his body; this action is inconsistent with the subsequent information that the rope lays outside of the cage. There is no way for John to tie the rope around his body if the rope sits beyond a physical barrier.

The reflexive's suggestion of an in-peri-personal space construal is secondarily demonstrated by the use of the long-distance reflexive. The long-distance reflexive sounds natural in (70):

- (70) *John reached out, grabbed the can, and the gasoline spilled all over himself.*

The reflexive is natural in (70) because it is implied that the gasoline covers John's body. If the gasoline spills onto a location near John, but not onto his body, as in (71) the reflexive becomes ungrammatical:

- (71) **John reached out, grabbed the can, and the gasoline spilled next to himself.*

These pragmatic differences suggest that the use of the reflexive pronoun in these contexts requires an in-peri-personal space construal.

4.4 Spatial parameters: Directionality

Wechsler (1997), like MacDonald (2004), notes that English directional prepositions pattern differently from locative prepositions with regard to anaphoric pronoun distribution. Sentence (72a) and (73a) show nondirectional prepositions occurring with the nonreflexive pronoun, and (72b) and (73b) show directional prepositions occurring with the reflexive pronoun:

- (72) a. *Bubba_i tossed the beer can behind him_i / *himself_i.*
(Wechsler 1997: 15 #38a)
- b. *Bubba_i tossed the beer can to *him_i / himself_i.*
(Wechsler 1997: 15 #38b)
- (73) a. *Corporal Crump_i pinned the medal beside him_i / *himself_i (on the wall).*
(Wechsler 1997: 15 #39a)
- b. *Corporal Crump_i pinned the medal onto *him_i / himself_i.*
(Wechsler 1997: 15 #39b)

The same contrast is evident in the BNC data shown in (74):

- (74) a. *He_i could have stuck pins into **himself_i** and it would have taken ten seconds for his body to complain.*
(FSP 2109)
- b. *He_i put the opened bottle down next to **him_i** and smelled the top.*
(CA3 641)

As a semantic predictor of pronoun distribution, directionality is a far more complex schematic category than containerhood and peri-personal space, and the analysis of directionality needs to be situated at various levels of event semantics. The first complicating factor is the fact that verbs, as individual lexical items, come with an inherent and canonical direction of their own. Secondly, some prepositions are lexically directional and others are recruited into a directional function based on the semantics of the event. In the analysis of directionality as a macro-semantic parameter, care is required in the assignment of directionality to any one particular syntactic and/or semantic level.

The idea that directional PPs generate a different syntax than nondirectional PPs has made its way into several formal theories of syntax (Svenonius 2004; Tunsteth 2003). These theories utilize functional projections and aim to incorporate basic spatial semantic categories into the syntactic model. This research focuses on two issues: what types and classes of words should be included in the

category P as well as how to formally model the internal semantic structure of these PP heads (Svenonius 2004). Within this model head Ps are allowed functional projections such as PATH or PLACE, which are meant to capture the categorical semantics of spatial adpositions and are used to model distributional regularities found among spatial systems. Functional projections have also served as a theoretical tool to explain certain interactions between spatial terms and other areas of the grammar. Tungseth (2003), modeling pronominal distribution in Norwegian, argues that directional prepositional phrases differ structurally from nondirectional, locative PPs. She uses the *do-so* substitution test to suggest that goal PPs are complements of the verb, whereas locative PPs attach as adjuncts outside the VP, mimicking the similar claim made by MacDonald (2004) for Spanish and Buring (2005) for English.

Analyses such as these rely on strict categorical divisions between PP adjuncts and PP complements. I have already shown this division to be problematic. Many BNC examples contradict the strict division to which these researchers allude. The reflexive pronoun certainly does occur in contexts in which the referent directs an action toward his body as shown in (75):

- (75) a. *The boat was wedged across a rock where the current was not as bad as that elsewhere, and they threw a rope across to McCandless_i who_i tied it around himself_i and the near-unconscious woman.*
(BM9 874)
- b. *He_i wraps around himself_i the dusty patchwork cloak of his invisibility and the heralds gallop hither and yon in vain.*
(ECU 2345)

Yet, more examples involving body-centered directional actions occur with the nonreflexive pronoun as in (76). (In a syntactic theory like Tungseth's these directional PPs would have to be treated as complements, therefore violating Condition B.)

- (76) a. *He_i pushed the pad aside, PRO_i drew the typewriter toward him_i and began to type again, squinting down at his friend's tiny handwriting.*
(A08 449)
- b. *He_i pulled the notebook toward him_i and wrote: Check early drypoint, Heroin for a Penny, refs.*
(A08 486)
- c. *He_i stopped and turned her toward him_i and tried to kiss her on the mouth.*
(A0N 1858)

“Directionality”, the semantic descriptor used by Wechsler, MacDonald, and Tungseth, incorporates a large number of corpus examples and includes a broad range of prepositions: those that are always directional (*around, toward, into*, etc.) and those that are sometimes directional (*in, on*, etc.). Examples in my corpus were coded as ‘directional’ not by the inherent ‘directionalness’ of the preposition, but according to the ‘directionalness’ of the PP in the context of the entire predicate.

At the macro-semantic level, directional PPs do pattern with a slightly higher rate of reflexive pronouns than the rate of reflexives in nondirectional contexts. In fact, we find the reflexive is roughly one and a half times more likely to be found in these prepositional phrases than in the nondirectional prepositional phrases (95% confidence interval for p_1/p_2 is [1.08, 1.65] [Agresti 2007: 27]). Still, contrary to intuition, within the directional data, the nonreflexive pronoun is actually more common¹⁶.

The sharp dichotomy suggested by Wechsler (and MacDonald 2004) is not only unconfirmed but the data actually demonstrate a pattern opposite to what would be their prediction since, within the BNC sample, 78% of directional PPs pattern with the coreferential nonreflexive pronoun.

Wechsler, MacDonald, and Tungseth’s claims of an association between directional PPs and argument PPs, although simplistic, are not without merit. When the semantic parameter of directionality is combined with containerhood, the occurrence of the reflexive pronoun is extremely high and significantly differs from the reflexive distribution in container contexts that are not directional: in PPs headed by the prepositions which combine both directionality and containment (mostly *into, out of*, and sometime *in*), the reflexive pronoun patterns 96% of the time, compared to 52% in all the other container contexts.¹⁷ So, although directionality on its own is not a very strong predictor of a high distribution of reflexive pronouns, its predictive value is increased once it is combined with other schematic variables.

¹⁶ Total counts: directional events: 111 reflexives; 394 nonreflexives; nondirectional contexts: 191 reflexives; 971 nonreflexives.

¹⁷ Total counts: directional contexts including containment: 45 reflexives; 2 nonreflexives. Container contexts with no directionality: 161 reflexives; 149 nonreflexives.

4.5 The symbiotic relationship of directionality, containerhood, and peri-personal space

I suggest that the semantic factors outlined here are not independent predictor variables, but are highly related to each other. Of primary interest, some examples that conflate all three semantic factors seem to require the reflexive pronoun in order for coreference to be assumed as in (77):

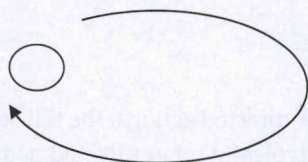
(77) *John_i stabbed the knife into himself_i/???him_i.*

Without proper context, the nonreflexive pronoun in (77) would most likely be interpreted as referring to someone other than John. In this case, John performs a directional action toward his container-construed body, all carried out within his peri-personal space. Although syntactically different, (77) is semantically similar to a reflexive action like in (78):

(78) *John stabbed himself with a knife.*

In both (77) and (78), John fills both agent and patient/experiencer roles: the very definition of a prototypical reflexive action (Faltz 1977). From a more schematic perspective, Kemmer (1993:52) represents the prototypical direct reflexive situation as an event which involves only one participant, who serves as the Initiator and the Endpoint of the event. She uses the following diagram to illustrate this idea:

(79) Initiator + Endpoint



Unlike a transitive event schema in which two separate entities fill the Initiator and Endpoint roles, a reflexive event schema requires the same entity to fill both roles.

Van Hoek (1997) further elaborates Kemmer's characterization of reflexivity. In applying event semantics to anaphoric distribution, Van Hoek (1997: 181) directly addresses examples in which one of the two pronouns is found in a PP:

For some speakers the object of a preposition will be coded as a reflexive (rather than a nonreflexive pronoun) only if it is construed as elaborating a participant in the energetic interaction profiled by the verb; if it describes part of the setting, so that there is no energetic connection linking the antecedent and the anaphor, a pronoun will be used instead.

Although the BNC corpus suggest that Van Hoek's observation should be qualified as a tendency rather than a rule, her insight holds for examples such as (77) in which the "energetic interaction" of stabbing a knife flows from John, the agent, to John, the patient. Van Hoek's characterization of when a reflexive is used in the PP establishes a parallel between the directional PP data and Kemmer's portrayal of a reflexive event prototype. Both involve the circular energy schematic in (79). This hypothesis, however, is not so simple. If, as Van Hoek suggests, the reflexive pronoun signals this self-directed energetic relation, then why do so many directional actions, nevertheless, pattern with the nonreflexive pronoun? To answer this puzzle, it is useful to investigate how the semantics of directionality encoded in the PP interact with the semantics of directionality encoded in the verb.

4.6 Directionality of the PP and directionality of the verb

The analysis above serves as a hypothesis as to why the reflexive is obligatory in example (80), but why is it less common in (81) and (82), and, for that matter, why is the nonreflexive in (81) and (82) not only grammatical, but also more frequent?

- (80) *John_i hurled insults at himself_i/*him_i.*
 (81) *John_i drew her toward him_i/himself_i.*
 (82) *John_i threw the can away from him_i/himself_i.*

Within the set of English verbs that denote other-directed actions, the reflexive is required in the simple clauses when the prototypically other-directed action is self-directed. These predicates, which I will call 'extrinsically reflexive' (following Stojanovic 2002: 313), need the reflexive pronoun to indicate that the event is in fact reflexive in nature as in (83–85):

- (83) *John_i attacked himself_i.*
 (84) *John_i bit himself_i.*
 (85) *John_i loves himself_i.*

Forming a different English category of verbs, there are a small number of canonically self-directed predicates, which I will call 'intrinsically reflexive' (following Stojanovic 2002: 313) (Reinhart and Reuland (1993) term these predicates 'lexically reflexive'). For example, the predicates *bathe* and *shave* are most often performed on one's own body, and often show up as intransitives in the syntax. However, these verbs are different from other intransitives, e.g. *cry*, *sleep*, etc. since they can co-occur with an object, and are construed as semantically transitive – there is a patient involved. These verbs are also different from other semantically transitive verbs because contrary to typically other-directed, outwardly-directed actions, these actions are canonically inwardly-directed and are often not marked with the reflexive in English:

(86) *John bathed.*

(87) *John shaved.*

We can see how these verbs, optionally intransitive, are still understood to have a patient/landmark (the subject), but since they are canonically self-directed, that patient doesn't have to be syntactically expressed. (Notice how this is different from a canonically outwardly-directed action like kicking, which cannot ever appear in an intransitive construction with a reflexive interpretation: **John kicked [himself]*, and, for that matter, can appear only as an intransitive with a very specific meaning like 'move leg in an outward motion'.)

Examples from the BNC corpus indicate that the nonreflexive pronoun is perfectly grammatical and more frequent than the reflexive when the direction of the verb coincides with the direction encoded in the PP (both are inwardly-directed in this case) as in the representative example constructed in (88):

(88) *John_i pulled the book toward him_i.*

The action of pulling is typically self-directed and would most likely be performed in the direction toward the puller's body. Schematically, this complex predicate functions similarly to an intrinsically reflexive verb like *shave* since the act of pulling, like shaving, is most likely directed at John's own body. (Prepositions denoting overt spatial relationships of the type in (88) require an object in the syntax; they have to be syntactically transitive. To be used in the description of an event that is self-directed, they must be followed by one of the two pronouns; otherwise they are ungrammatical: **John_i pulled the book toward*. In this way they are unlike the verbs in (86–87), which can appear as syntactically intransitive.) So why, then, in these cases, is the nonreflexive the preferred pronoun, and why is the reflexive not required but rather optional?

The answer to this question may come from historical uses of the reflexive. The reflexive pronoun began life as a marker of contrastive focus (König and Siemund 2000). In modern-day English it retains this purpose as in (89):

(89) *John, himself, wants to finish the job.*

Here, the reflexive focuses John as the agent of wanting to finish the job; the reflexive contrasts John from a set of other possible agents. I suggest that the same semantic feature of contrast marking is signaled with the reflexive in simple clause structure shown in (83–85). In these examples the contrastive element is the fact that John, himself, fills the patient role which would canonically be filled by a different participant. These are examples in which an other-directed verb, contrary to expectation, contrary to typicality, is self-directed. Importantly, the reflexive is needed since it is the only marker of reflexivity and the only marker of inward directionality.

Returning to the PP data, we see that the reflexive is not needed in (81), as it is not needed with an intrinsically reflexive verb, because the action is already assumed to be self-directed. However, just as it is optionally used with an intrinsically reflexive verb, the reflexive can be used with no effect on grammaticality.

Inward-directed actions can be compared to an outward-directed action as in (90):

(90) *John_i pushed the book away from him_i.*

The action of pushing is typically other-directed and would most likely be performed in the direction away from John's body. In this case there is no contrast to mark. The outward direction of the verb coincides with the outward direction of the PP, and together this complex predicate functions just like a syntactically simple outwardly directed predicate. So here too, the reflexive is not needed since the directionality of the action coincides with the directionality of the preposition.

Under specific (and infrequent) contexts, these directional verbs might be switched to co-occur with a PP whose internal semantics indicates an oppositional direction. In these cases, the reflexive pronoun is, almost obligatorily, needed to indicate coreference as in (91) and (92):

(91) *John_i pulled the book away from himself_i/??him_i.*

(92) *John_i pushed the book toward himself_i/??him_i.*

The reflexive here serves two functions. It ensures a coreferential relationship between Initiator and Endpoint of the action, and the contrastive semantic element signaled by the reflexive highlights in (91) the fact that the typically self-directed action is actually directed away from the referent's body and, in (92), the fact that the typically other-directed action is actually directed toward the referent's body.

Inward and outward directionality need to be evaluated at the level of the predicate as a whole. Moving even further beyond the combinatorial semantics of the verb and preposition, some examples demonstrate that the verbal object too may be important in the choice of reflexive or nonreflexive pronoun. The following minimal pair shows the importance of the predicate as a whole in determining the choice of pronoun:

(93) *John_i stabbed the knife into himself_i/???him_i.*

(94) *John_i stabbed the needle into himself_i/?him_i.*

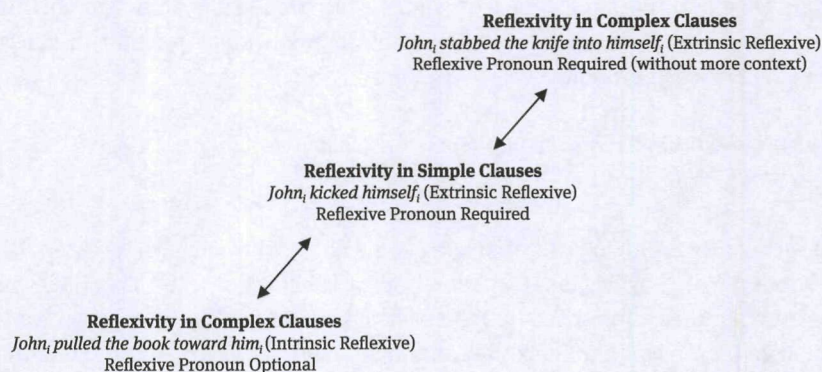
It seems that the action of stabbing a needle allows the coreferential nonreflexive pronoun more easily than does the action of stabbing a knife. This difference is presumably accounted for by the expected directionality of the two different predicates. We will assume knife stabbing is canonically and more commonly an other-directed action. Injecting oneself with a needle occurs more frequently as a self-directed action. The reflexive is needed to reinforce the notion that the action is reflexive in nature. It is less necessary in (94) because the predicate itself is more likely to already be self-directed and reflexive. The contrast between these two examples demonstrates that a lexically non-reflexive verb (in Reinhart and Reuland [1993] terms) such as *stab* is not evaluated individually, rather it is evaluated for reflexivity at the level of the predicate as a whole which includes verb, preposition, and object.

4.7 Reflexive predicates and nonreflexive predicates

I have argued that self-directed actions, performed on the referent's body or within the referent's body, very much resemble the semantics of the prototypical reflexive use in simple clauses. The two clause types share abstract spatial schematics. They are both cases that involve a circular energy transfer in which there is an alignment between the Initiator and Endpoint of the event. Reflexive actions of this type fall into two distinct categories in English: those that are intrinsically reflexive (reflexive marking is optional) and those that are extrinsically reflexive (reflexive marking is required). In a construction-based semantic network, such

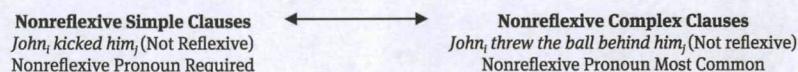
as that proposed in Cognitive Grammar (Langacker 2002; Van Hoek 1995, 1997), structurally different expressions of reflexive actions are related to one another in a network. In a network such as this, simple and complex predicates (predicates of different form), which share basic spatial schematics, are hypothesized to be part of the same network vis-à-vis shared function. The diagram in (95) illustrates this proposed network for the semantic domain of reflexivity:

(95) **Network of Reflexive Clauses**



The network diagram captures the idea that intrinsically reflexive predicates are optionally marked with the reflexive pronoun and extrinsically reflexive predicates require the reflexive pronoun. If the reflexive pronoun, in an extrinsically marked reflexive predicate, were replaced with the nonreflexive pronoun, the predicate would cease to be reflexive. The corpus data is, of course, also comprised of these nonreflexive predicates. These are cases where the pronoun and subject are coreferent, but the Initiator and Endpoint are not the same entity. These denote outwardly directed actions that have no circular energy transfer. The event, from start to finish, is construed as an outwardly directed action. In this sense, these complex predicates are similar to simple outwardly directed clauses as shown in the relational diagram below:

(96) **Network of Nonreflexive Clauses**



If an event is not reflexive in nature, we expect to find the nonreflexive pronoun in the prepositional phrase, since the reflexive pronoun is a marker of reflexivity.

5 Repercussions for syntactic theory

The spatial characterization of reflexive events discussed above assumes that a reflexive event is defined by referential identity between the Initiator and Endpoint of the action. The person or entity that initiates the event is the same person or entity that is affected by the event. In English, there are several ways to mark this symmetry. Rarely it is marked on the verb as in (97):

(97) *Some narcissists self-loathe unconsciously.*

Sometimes it is present in a description:

(98) *John is a self-hater.*

And, as discussed above, intrinsically reflexive events show this symmetry with no required marking at all:

(99) *John shaved this morning.*

(100) *John pulled the book toward him.*

Finally, of course, and most commonly, the shared identity between Initiator and Endpoint is marked with the reflexive pronoun as either the object of the verb or of the preposition in an extrinsically reflexive event:

(101) *John stabbed himself.*

(102) *John stabbed the knife into himself.*

These examples show, crucially, that a reflexive event may be marked with the reflexive pronoun, but that marking is not a requirement for the event to be construed as reflexive. Needless to say, the reflexive semantics in the examples given above affect the event's construal. So, how does semantic reflexivity interact with the syntactic model of anaphora?

Safir (2004: 3) states, "Binding Theory remains at the heart of most current approaches [to anaphora] in generative grammar". One of the syntactic arguments for the need for Binding Theory comes from examples of ellipsis. In syntactically simple clauses, binding has been used to explain why the reflexive semantics of Clause 1 carry over to the *vp*-elided reconstruction in Clause 2 as in (103):

(103) *John kicked himself and then Larry did too.*

(Sloppy Reading: Larry kicked Larry.)

(Strict Reading: Larry kicked John.)

In the sloppy reading Larry kicked Larry not John. The syntactic explanation of the sloppy interpretation is that both the structure and identity relationships of the subject and object in Clause 1 are copied to Clause 2 (along of course with the specified verbal semantics): *Larry* fills the specifier position of Clause 2 and his identity automatically fills the object position as well, thus providing the semantically reflexive interpretation that Larry kicks himself. In the “strict” reading of (103), Larry kicks John. The syntactic explanation of the strict interpretation is that only the structural relationship of the subject and object in Clause 1 is copied to Clause 2. The identity relationship between subject and object positions is not copied; therefore the assignment of John as Patient in Clause 1 is carried over to the interpretation of Clause 2. In Clause 2, Larry fills the Agent role, but John remains as the Patient; the reflexive interpretation of Clause 1 is not carried over to Clause 2.¹⁸

The corpus trends display interesting properties when tested with syntactic copying. Context free VP ellipsis tests of the PP data indicate that for many examples, one interpretation (strict or sloppy) is more “available”, more natural, than the other. The data suggest that binding between antecedent and pronoun is affected by reflexive semantics, which are in turn understood (as we have established) by spatial schematics. In order to demonstrate this intriguing interaction, the PP data has been divided below by pronoun type.

We can first examine binding relationships through Principle A: the reflexive must be bound within the relevant minimal domain. One reason the reflexive appears in the PP is to signal a syntactically complex event is in fact reflexive in nature: a canonically outward directed action is directed toward the referent’s body, as in (104):

(104) *John_i pushed the box toward himself_i.*

A second reason the reflexive might occur is to reflect the metaphorical understanding of the human body as a container as in (105):

(105) *John_i found the truth within himself_i.*

¹⁸ Safrir (following Fiengo and May 1994) calls this type of reading an example of ‘vehicle change’ (2004: 133).

A third reason the reflexive might occur is to signal that the action is performed within the referent's peri-personal space as in (106):

(106) *John_i put the blanket around himself_i.*

In all of these cases, *John* and *himself* are co-indexed and their relationship follows the definition of binding: *John* binds *himself* if *John* and *himself* are co-indexed and *John* c-commands *himself* within the relevant minimal domain. We can speculate that Büring and Hestvik would conclude that the relevant minimal domain is the clause, not the PP, in these cases since the PPs in (104–106) are complement-like in nature. In fact, the *VP ellipsis* test performed on (104–106), confirms the special relationship between the antecedent and the reflexive pronoun, in each case whatever spatial relationship is set up between antecedent and pronoun in the first clause holds for the second:

(104) a. *John_i pushed the woman toward himself_i, and Larry did too.*

(Most available reading: Larry pushed the woman toward Larry.)

(105) a. *John_i found the truth within himself_i, and Larry did too.*

(Most available reading: Larry found the truth within Larry.)

(106) a. *John_i put the blanket around himself_i, and Larry did too.*

(Most available reading: Larry put the blanket around Larry.)

In (104a–106a), the sloppy reading is most available; it is assumed that Larry performs the same actions in reference to his own body, not in reference to John's body. Example (104a) shows that the reflexive semantics established in Clause 1 of (104a) have a strong tendency to carry over to Clause 2. Example (105a) shows that the protagonist's body-internal actions in Clause 1 carry over to the reconstructed event in Clause 2. And, example (106a) confirms that a self-directed action in Clause 1 is reconstructed as a self-directed action in Clause 2. It should not be surprising that these facets of semantic reflexivity from Clause 1 are carried over to Clause 2 if we postulate that the syntactic binding relationship between antecedent and reflexive is also copied.

The more surprising results come from the canonical uses of the nonreflexive in the PP. In (107) the nonreflexive occurs because the syntactically complex event is already reflexive in nature, the action is canonically performed toward the referent's body and the reflexive pronoun is not needed to signal reflexivity:

(107) *John_i pulled the woman toward him_i.*

A second reason the nonreflexive might occur is in a case in which the action is literal and not metaphorically performed within the referent's body as in (108):

(108) *John_i put the book next to him_i.*

And a third reason the nonreflexive might occur is to signal that the action is not necessarily performed within the referent's peri-personal space as in (109):

(109) *John_i constructed the fortress around him_i.*

Of interest in this set is example (107). It is example (107) that seems to conflict with the principles of binding when subject to an ellipsis test. Here, the relevant question for a theory of syntax is, does the nonreflexive pronoun gain its reference through binding or through independent coreference? The nonreflexive, according to Principle B, should be free in the minimal domain; that is, the nonreflexive can be co-referent with the subject, but its reference should be attained independently; it should not be bound by the subject. Yet, the same VP ellipsis tests performed above in (104a–106a) to show that the reflexive is bound, clearly show here in (110) that the nonreflexive can also be bound within the same syntactic domain:

(110) *John_i pulled a woman toward him_i, and Larry did too.*

(Most available reading: Larry pulled a woman toward Larry.)

In (110), the first and most available interpretation is the sloppy reading in which Larry is performing the same exact action as John; the action is performed in reference to Larry's body (not John's), and in this interpretation, the same spatial relationships between the referent and the pronoun set up in the first clause hold in the second. In Clause 1 of this sloppy reading, the subject position c-commands the PP object position and they are co-indexed, therefore the pronoun is bound. From a syntactic perspective, this structure-identity relationship is copied to Clause 2 yielding the reflexive interpretation of Clause 2. Example (110) suggests that canonical uses of the coreferential nonreflexive in a reflexive event may trigger a bound relationship between antecedent and pronoun more easily than its use in a nonreflexive event. So, for example, in (111) below, in which the coreferential nonreflexive is used in a spatial context that is not reflexive, the unbound (strict) interpretation is equally available with the bound (sloppy) interpretation. In the strict interpretation *John* and the pronoun are co-referent, but in the "reconstructed" event in the elided VP, John is assumed to still be the spatial landmark for the event, not Larry:

(111) *John_i pushed a box away from him_i, and Larry did too.*

(Possible interpretation: Larry pushed a box away from John.)

(Possible interpretation: Larry pushed a box away from Larry.)

What these examples show us is that the interpretation of an elided VP is sensitive to the event's semantics and whether or not the event is reflexive in nature. The reflexive semantics of a reflexive event, even one that is not marked with the reflexive pronoun, will likely be reconstructed under VP ellipsis as a reflexive event. This example set, as a whole, supports the idea that binding, as a structural relationship between pronoun and referent, may not be necessary to explain why reflexive semantics in first clauses carry over to "reconstructed" reflexive semantics in second clauses. We can make this conclusion because, within the appropriate semantic context, the bound interpretation is possible with either the reflexive or the nonreflexive pronoun. The data here can thus be added to a group of research, including Hardt (2003), that argues against a pure syntactic explanation of copying phenomena.

If a bound interpretation is sensitive to canonical spatial relationships and the conditions on binding are not the defining factor determining which pronoun will occur in a complex predicate, then an important question is raised as to Binding Theory's explanatory power for the complementary distribution of the two English pronoun types in syntactically simple predicates. Does Binding Theory explain the core distribution? As Safir (2004: 15) puts it, are binding conditions simply "stipulations" on domains or are they actually "about" the reflexivity of predicates? However, any potential answer to Safir's question begs the larger more fundamental question, which is: How should the semantic understanding of reflexivity be modeled in the grammar of English? Is Binding Theory needed to model the distribution of reflexive and nonreflexive pronouns? How can the difference between a reflexive and a nonreflexive interpretation, namely the fact that there are two interpretations, be explained without referencing the syntax?

The answer to this question lies in one's opinions about the fundamental primitives of grammar. If those primitives are based on spatial relations, energy dynamics, and abstracted schematic simulations, then the answer is relatively simple. We can now return to the core data in (103), repeated here in (112):

(112) *John kicked himself and then Larry did too.*

(Sloppy Reading: Larry kicked Larry.)

(Strict Reading: Larry kicked John.)

In Clause 1, John performs a reflexive action where he kicks his own body, and that action is simulated as such. Clause 2 is more open to interpretation because

its lacks essential semantic information. In one case the actor, Larry, is simulated performing a reflexive action himself; thus Larry carries out the same kicking action that John does on Larry's own body. Larry, like John in Clause 1, is both the Initiator and Endpoint of the action. In another case, Larry is simulated to kick John. John has been identified as the target of the kicking in Clause 1 and so he can serve as a possible target of kicking in Clause 2 because not enough information is provided to rule out that simulation. Clause 2 allows for two possible energetic relationships and thus two possible simulations of the event.

6 Conclusion

Syntactic approaches to binding always reference the way in which the theory cleanly models the core, simple clause complementarity of reflexives and nonreflexives. However, within this literature there is no explanation given as to why. With the proposed enriched model of semantic reflexivity we can now give a semantic explanation as to why Binding Theory predicts complementarity in syntactically simple clauses.

We have seen from the data that the reflexive pronoun is just one of several signals of a reflexive event. It is argued here that binding should be decoupled from semantic reflexivity, that, to use Safir's words, the conditions on binding are not "about" reflexivity per se, but rather denote an ad hoc structural relationship that exists within the English data. The reason an event is construed as reflexive is not because the reflexive pronoun is dependent on its antecedent for reference, but because the reflexive pronoun signals an Initiator-Endpoint alignment in the construal of the event. As we have seen, this same Initiator-Endpoint alignment can also occur even with the use of the nonreflexive pronoun when a syntactically complex predicate is canonically inwardly directed.

Of course addressing some questions raises others. This paper has focused on *trends* in the use of the reflexive versus the nonreflexive pronoun in the PP. All of our data point to levels of frequency in corpus data, which we translate to likelihood of usage by an individual speaker. One question this methodology raises and does not answer is the following: If we actually understood every single piece of what constitutes a speaker's linguistic apparatus and what dictates the choice of one pronoun or the other (e.g. detailed spatial schematics, intended meaning, perspective marking, priming effects, memory, etc.), would we be able to predict with certainty which pronoun would be chosen in a given discourse environment? Or, is our data representative of a linguistic phenomenon which is truly unpredictable; in other words, is the distribution of pronouns in the PP an area of grammar that is best characterized by theories which incorporate probabilities of

occurrence, but not absolute prediction? For now these questions will have to await further investigation. What is clear from the research presented here is that the grammatical encoding of spatial relations is a central piece of this puzzle.

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Appendix 1: British National Corpus

The BNC is comprised of 100,106,008 words. The corpus covers 4,124 texts, of which 863 texts (5%) are transcribed from spoken conversations or monologues. Of the spoken texts, 762 (6,154,248 words) are transcriptions of spoken texts collected from a pre-defined set of domains or contexts: educational, business, institutional, leisure, and unclassified. A total of 153 texts (4,211,216 words) are transcriptions of spoken texts collected by recruits identified by demographic sampling of the UK population, and the speakers represent different ages, social classes, regions of the UK, and sexes. Each text has been segmented into orthographic sentence units. Because of copyright laws, full published works are not included in the Corpus (Meyer 2002); rather small excerpts of published materials reside in the database. The Corpus was completed in 1994, and mostly includes texts from 1975–1994 and a few texts dating back to 1964. 75% of the written texts were chosen from *informative* writings: of which roughly equal quantities were chosen from the fields of applied sciences, arts, belief and thought, commerce and finance, leisure, natural and pure science, social science, world affairs. 25% of the written texts are *imaginative*, that is, literary and creative works. The type of published material included (the *medium*) is comprised of 60% books, 25% periodicals (newspapers and magazines etc.), between 5% and 10% miscellaneous published material (brochures, advertising leaflets, etc.), and between 5% and 10% unpublished written material such as personal letters and diaries, essays and memoranda, etc. I did not specify my searches, and thus my search findings include written and spoken data from all mediums and topics represented in the corpus.

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