

The Syntax of Spatial Anaphora

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Abstract

In this paper, we provide a comprehensive Minimalist analysis of the apparent free variation between pronouns and anaphors in *snake*-sentences. Three sets of data provide the basis for the analysis: hitherto unobserved restrictions on quantifier-pronoun relationships, classical observations about the role of perspective or point of view (Cantrall 1974), and interpretive effects concerning the nature of the locative relationship (Kuno 1987). We propose an analysis of spatial prepositions in terms of Svenonius' (2006) AxPartP. Spatial interpretations may be object-centered or observer-centered. We correlate these two interpretations with two distinct grammatical representations. The object-centered interpretation involves an Agree relation between AxPart and the complement of P, the observer-centered interpretation is the result of a binding relationship between AxPart and the Speaker, represented in Mood_{Evid}P. An Agree relation requires the presence of the complex anaphor *himself*, whereas binding of AxPart by the Speaker is only compatible with the pronoun *him*.

1. Introduction

The usual complementary distribution between pronoun and anaphor predicted by the binding theory is lacking in so-called *snake*-sentences as in (1):

(1) Tony saw a snake near him/himself.

We take *snake*-sentences to be characterized by the following properties:

- the preposition has locative meaning.
- in many (though not all) cases, pronoun and anaphor are both possible, sometimes with a difference in meaning.

As such, these sentences constitute a unique environment for studying minimal contrasts between anaphors and pronouns that remain obscured in other contexts.

There are three sets of facts we would like to discuss in connection with *snake*-sentences: the binding of pronouns by a quantifier, perspective

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or point of view, and the nature of the locative relationship. Although many of the facts belonging to the latter two areas have been noticed and described in the literature, no serious attempt that we know of has been made so far to provide a formal account of them.

1.1. Quantifier-pronoun binding

A fact that has hitherto gone unnoticed in the literature is that *snake*-sentences display unexpected behavior when it comes to the binding of a pronoun inside the PP by a quantifier in subject position.

- (2) a. Everyone/ Nobody saw a snake near them/*him.
 b. Everyone saw a snake near himself.

In (2a) the pronoun *him* is *c*-commanded by the quantifier in subject position, but it cannot be bound by the latter. A plural pronoun is possible, however, as is the singular *self*-form in (2b). The facts in (2) are unexpected, since *c*-command is normally a sufficient condition for variable binding, as in (3):

- (3) Everyone/Nobody thought that he was going to win the prize.

The facts are slightly more complex: if the quantified subject occurs in a generic sentence, binding of the singular pronoun becomes possible again:

- (4) Every player puts a pawn near him. (rule in a game)

The plural pronoun in (2) appears to function in the manner of an E-type pronoun, as described by Evans (1980) for cross-sentential anaphora, as in (5):

- (5) a. Everyone came in. They/ *He sat down.
 b. Every congressman came to the party. *He/?They had a marvelous time (Evans 1980:341)

The possibility of having a singular pronoun bound by the quantified subject in generic *snake*-sentences (see (4)) is mirrored by cross-sentential anaphora in generic contexts as well (Groenendijk and Stokhof 1991):

- (6) Every player chooses a pawn. He puts it on square one.

The occurrence of the plural pronoun in cross-sentential anaphora with a downward-entailing quantifier like *nobody* is subject to the possibility of assigning a D-linked or partitive interpretation to the quantifier, as the contrast in (7) reveals:

- (7) a. Nobody came to the party. They/*He all stayed home.
 b. Nobody is perfect. *He makes/*They all make mistakes.

In (7a) the plural pronoun can refer back to a contextually given group of people, of whom no-one came to the party. When such a non-D-linked interpretation is excluded, as in the generic (7b), the plural pronoun is ruled out as well. Interestingly, the same pattern can be observed with *snake*-sentences:

- (8) a. None of our friends saw a snake near *him/them
 b. Nobody always sees snakes near *him/*them.

We therefore conclude that the binding of a pronoun in *snake*-sentences surprisingly obeys conditions on cross-sentential anaphora.

We will propose an analysis that relates the three phenomena discussed above, and derives them in a principled way from configurational properties.

1.2. Perspective

Cantrall (1974:148-49) observes that the choice of anaphor or pronoun correlates with the perspective taken (see also Kuno 1987:Ch2, van Hoek 1997:176ff).

- (9) a. They placed their guns, as they looked at it, in front of themselves/*them.
 b. They placed their guns, as I looked at it, in front of *themselves/them.

If the perspective is that of the subject, as in (9a), only the anaphor is possible. If the perspective is that of the speaker, as in (9b), only the pronoun is.

Poutsma (1916:20) (as quoted by Cantrall 1974:149) mentions the following examples revealing another difference in perspective of the kind discussed above.

- (10) a. It distressed me to see him (i.e., the German Emperor) sit, working listlessly, and now and again staring in front of himself. (*Times* No. 1988:115c)
 b. A simple aged officer staring earnestly in front of him that is the impression which the portrait (i.e., of the Kaiser) makes. (Ib.)

In (10a), the reflexive triggers a subject-centered interpretation, in this case the subject of *staring*, i.e., the Emperor. As a result, the hearer is invited to identify with the perspective of the Emperor. In (10b), by contrast, we are dealing with the observer-centered perspective. The observer-centered perspective is favored by the inclusion of the sentence *that is the impression which the portrait makes*.

The generalization that emerges on the basis of both (9) and (10) is that speaker perspective correlates with the pronoun, subject perspective

with the *self*-form. While the effect of perspective does not come to the fore quite as noticeably in every *snake*-sentence, we find that, when it is there, the facts are consistently in line with the generalization just made. We will discuss more cases like (9) below in §3.1.2

1.3. The nature of location

An interpretive effect of a different nature is illustrated by the case in (11):

- (11) a. Mary kept her childhood dolls close to her. (= proximity/vicinity)
 b. Mary kept her childhood dolls close to herself. (= against her body)

The difference between the use of the pronoun or anaphor correlates with a difference in the nature of the location of the dolls with respect to Mary. The use of the pronoun allows for a relatively abstract location of the dolls: the dolls could be at her home, for example, although Mary might be out of the house at the moment (11a) is uttered. In contrast, the use of the anaphor forces a very concrete locative interpretation, where the dolls are in contact with Mary's body.

A similar contrast can be observed in (12):

- (12) a. Zelda examined the floor under her.
 (while standing on the lawn in front of her building)
 b. Zelda examined the floor under herself.
 (*while standing on the lawn in front of her building)

In (12a) *the floor under her* refers to Zelda's neighbor's apartment. The location of the apartment with respect to Zelda is abstract in the sense that, at the (past) reference time of (12a), the neighbor's floor need not be physically under Zelda. The sentence (12b), by contrast, requires a concrete interpretation: *the floor under herself* refers to the floor Zelda is standing on at the reference time.

Kuno (1987) was the first to note these interpretive effects regarding the nature of the location (cf. also Levinson 1991, van Hoek 1997:181), quoting examples like the following:

- (13) a. John hid the book behind himself.
 b. John hid the book behind him.
 (14) a. John put the blanket under himself.
 b. John put the blanket under him.
 (15) a. John pulled the blanket over himself.
 b. John pulled the blanket over him.

Kuno notes that (13a) implies direct contact: John held the book in his hand and put it behind his back. The sentence (13b) does not require physical contact between John and the book: the book can be on a chair

with John standing in front of the chair so that the book could not be seen. Similarly, the sentence (14a) implies that John covers the blanket with his body, while only (14b) is compatible with a broader locative reading where John is sitting on a chair that he put on top of the blanket. In (15a), Kuno (1987:66) notes, the blanket must be over John’s entire body, but if only his head is sticking out, (15b) must be used. In other words, (15a) requires a concrete body-oriented reading, while (15b) affords a more abstract, ‘looser’ interpretation of what locatively counts as ‘over John.’

As with the perspective data discussed earlier, these effects are not noticeable in all *snake*-sentences, but when they are noticeable the facts point consistently in the same direction: the *self*-form requires a locative relation of concrete, close, total bodily proximity, while the pronoun allows for a more abstract, looser, or partial locative relation: vicinity, proximity, partial coverage.

Kuno’s (1987:67) analysis for these facts reduces to a semantic constraint on reflexives: reflexive pronouns in English are used if and only if they are the direct recipients or targets of the actions represented by the sentences. While descriptively adequate, this constraint remains unrelated to more general principles of the grammar.

2. Axial Parts

2.1. Ingredients

In our definition of *snake*-sentences, the locative meaning of the preposition plays a central role. The subtleties of the interpretation of locational PPs require us to take a closer look at the primitives of spatial expressions.

Jackendoff (1996:14-15) observes that there are three subsets of the vocabulary that invoke the spatial axes of an object:

- objects have “axial parts” (their *top*, *bottom*, *front*, *back*, *sides* and *ends*), which behave grammatically like parts of the object, but differ from standard parts (e.g., *handle*, *leg*) in that they have no distinctive shape. They are regions of the object determined by their relation to the object’s axes. The up-down axis determines top and bottom, the front-back axis determines front and back and several criteria for horizontal axes determine sides and ends (Miller and Johnson-Laird 1976, Landau and Jackendoff 1993).
- certain spatial prepositions (*above*, *below*, *next to*, *in front of*, *behind*, *alongside*, *left of* and *right of*) “pick out a region determined by extending the reference object’s axes out into the surrounding space. For instance, *in front of X* denotes a region of space in proximity to the projection of X’s front-back axis beyond the boundary of X in the frontward direction” (1996:15). Many prepositions are morphologically related to nouns that denote axial parts (e.g., *in front of*).

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- dimensional adjectives and their nominalizations (*high, wide, long, thick* and *deep; height, width, length, thickness* and *depth*)

Of these, we will make use of the first two in our explanation of the data observed above.

The axial vocabulary is used in the context of a frame of reference; the literature (see e.g., Levinson 1996 for a review) usually distinguishes two frames of reference:

- an intrinsic or object-centered frame (this frame has to do with properties of the object, e.g., its shape or its canonical orientation).
- a deictic or observer-centered frame

Not all objects have intrinsic “axial parts,” or some may have them along one axis but not another. A ball does not have an intrinsic top or bottom or front or back. A car has an intrinsic top and bottom, front and back as well as left and right sides. By contrast, a tree has an intrinsic top and bottom, but lacks a front and back as well as left and right sides.¹ Still, when speaking of a ball or a tree, we can refer to their front and back or left and right, but these axes are then exclusively determined by the position of the observer (subject or speaker) with respect to the ball or the tree. With objects that have intrinsic axial parts, like cars, this may lead to locative ambiguity. The sentence (16) can describe both the situations depicted in A and B. In A, the suitcase is behind the car from the perspective of the person standing: the suitcase is on the side of the car that is invisible to her. We call this the observer-centered frame. In B, the suitcase is behind the car from the perspective of the car: it is at the rear side of the car. We call this the object-centered frame.

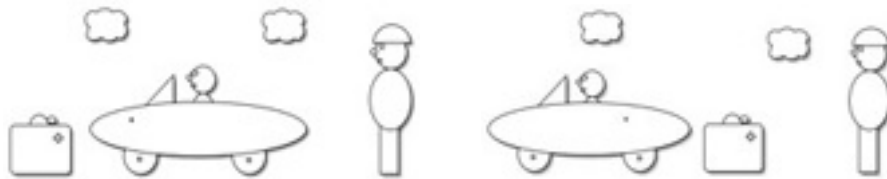
(16) The suitcase is standing behind the car.

A. Observer-centered frame

Perspective of the person standing:
invisible side of car

B. Object-centered frame

Car perspective:
rear side of car



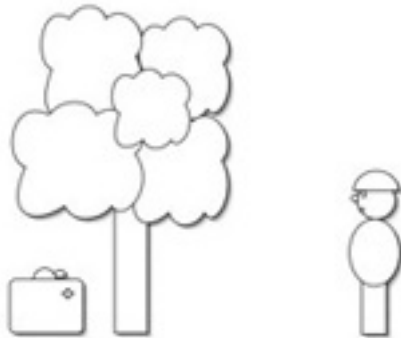
¹We take the left-right dimension to be derivative of the front-back axis. There seem to be no prepositions with a meaning that relies on the left-right dimension. Instead, periphrastic constructions involving a preposition are used, e.g., *to his left/right, on her left/right side, to the left/right of*.

The same ambiguity does not arise when objects like trees are involved, which lack the relevant axial dimensions. The sentence (17) can only describe the observer-centered frame depicted in A, not the object-centered frame depicted in B, because trees do not possess inherent front-back dimensions. The tree does not have a rear side independent of the perspective of the observer, and therefore an object-centered frame is excluded (see also Fillmore 1997:66).

(17) The suitcase is standing behind the tree.

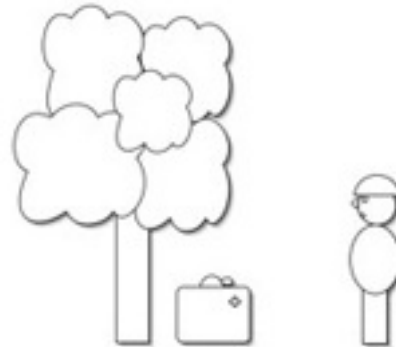
A. Observer-centered frame

Perspective of the person standing:
invisible side of tree



B. *Object-centered frame

Tree perspective:
rear side of tree



The car or tree perspective and the perspective of the person standing to the right in fact do not exhaust the options. There is a third perspective one could take, viz. that of ourselves who look at the scene depicted. Viewed from the perspective of an external onlooker, it would make sense to say the following:

(18) The suitcase is to the left/right of the car/tree.

Obviously, such a statement would be false or nonsensical from both the car's perspective and the perspective of the person standing to the right. It therefore appears that "observer perspective" may involve a variety of perspectives, including that of a character depicted or of an onlooker not depicted in a scene. Put differently, an observer-centered interpretation is deictic in that it can shift according to who observes from which perspective, just as the reference of the first person pronoun *I* may shift according to who uses it. We come back to the representation of this deictic interpretation extensively below.

2.2. Implementation

We argue that the difference between an object-centered and an observer-centered interpretation for a preposition is grammatically represented. As a starting point, we follow Svenonius (2006) in assuming that AxPart is a category like aspect or modality. In particular, we assume (19), an example of which is given in (20):

- (19) *Assumption about the syntax of Axial parts (I)*
 When used with a locative sense, prepositions project an AxPartP, whose head contains a set of feature(s) relevant to the preposition
- (20) [Place in [AxPart front [Kase of [D the car]]]] (Svenonius 2006:53)

Different prepositions refer to different axial regions or dimensions of their complement. We list some examples in (21):^{2,3}

- | | | |
|------|-------------|-----------------------------|
| (21) | above | top-bottom dimension |
| | around | all dimensions (universal) |
| | behind | front-back dimension |
| | below | top-bottom dimension |
| | beside | left-right dimension |
| | between | left-right dimension |
| | in | inside-outside dimension |
| | in front of | front-back dimension |
| | inside | inside-outside dimension |
| | near | any dimension (existential) |
| | on top of | top-bottom dimension |
| | on | top-bottom dimension |
| | outside | inside-outside dimension |
| | under | top-bottom dimension |
| | with | undefined dimension |

A consequence of the assumption in (19) is that the structure of prepositional objects, which have a preposition without a locative meaning, will be different: there are no Axial parts and no AxPart projection.

²The list is inspired by Zwarts' (2005) list of stative or locative prepositions (as opposed to dynamic or directional prepositions, which we do not consider here, as they do not occur in *snake-sentences*).

³Jackendoff (1996:15) notes that *near X* “denotes a region in proximity to X in any direction at all”.

- (22) a. Karen talked about herself/*her. (-location)
 b. Karen looked about herself/her (+location)
- (23) a. (In his dream)
 William had a conversation with himself/*him. (-location)
 b. (In his dream)
 William had a suitcase with *himself/him. (+location)
- (24) a. Miranda relies on herself/*her. (-location)
 b. The gun has dirt on *itself/it. (+location)
- (25) a. Samantha has confidence in herself/*her. (-location)
 b. Samantha has it in herself/her
 to become a great musician. (+location)

In the above sentences, the [-location] cases do not permit the pronoun, but only the anaphor. We attribute the impossibility of the pronoun in these cases to a standard Condition B effect. The [+location] cases present a more heterogeneous picture: the pronoun is always possible, but the anaphor is not, a fact which we shall attempt to provide an explanation for in the remainder of this paper. Returning to spatial PPs, we adopt (26):

- (26) *Assumption about the syntax of Axial parts (II)*
 Objects with intrinsic axial parts have a set of features listing the relevant axial parts {front-back, top-bottom, etc.}.

In the cases involving locative interpretations of prepositions, we found that there were basically two possible kinds of viewpoints one could take, an object-centered one and an observer-centered one. In a nutshell, the idea we shall defend is the following:

- (27) a. The object-centered interpretation is the result of an Agree relation *internal* to the PP between AxPart and axial features of its complement DP.
 b. The observer-centered interpretation is the result of a binding relationship between AxPart and something *external* to the PP, the Speaker.

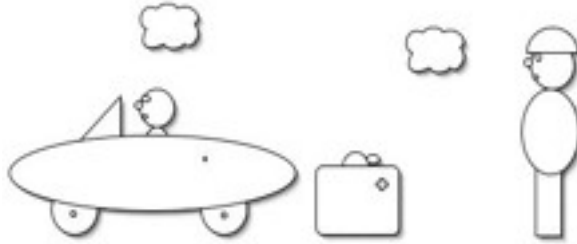
Let us now discuss these interpretations in turn, beginning with the former, the object-centered interpretation.

Combining the assumptions (19) and (26) above, we have a set of axial features on objects with axial dimensions on the one hand, and a similar set of features on the preposition (concretely AxPart) on the other. The object-centered relation arises as the result of an Agree relation between an object with axial features and the AxPart features of the preposition.

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- (28) The suitcase is standing [_{Place} be [_{AxPart} hind_{front-back} [_{Kase} ∅ [_D the car_{front-back-top-bottom}]]]]

Observer-centered frame
Perspective of the person standing:
 invisible side of car



If in (28) the axial dimensions {front-back} Agree, the object-centered reading obtains: axiality is determined entirely inside the projection of the preposition.

Accounting for the observer-centered interpretation requires some additional assumptions. Let us therefore formulate these in (29):

- (29) *Assumptions about the syntax of Speaker/ Observer*
- a. Any sentence has a deictic center, a reference point in relation to which deictic expressions are to be interpreted. The deictic center is the present time, location, participant role, and so forth of the speaker (Fillmore 1997; 1975:83-85).
 - b. Observer or deictic perspective is to be identified with Speaker perspective.
 - c. The Speaker is grammatically represented.
 - d. The Speaker can anchor AxParts via variable binding.

Recall from above that the observer-centered interpretation is deictic, i.e., requires a deictic anchor from whose perspective a location can be determined. This is not only true for spatial expressions, but also for temporal ones like *now* and *then*, as well as the tense of a sentence, which is always interpreted with reference to the speech time S. We propose to represent this deictic center as an (abstract) Speaker. Minimally, a speaker comprises a time and a place. Ross (1970) famously argues that every declarative sentence is embedded under a covert performative verb (see also Castañeda 1975; 1983 who attributes the origin of this idea to Kant; Tsoulas and Kural 1999, Guéron 2005, Giorgi 2006). Following Rooryck (2001), we assume that the ‘default’ interpretation of Cinque’s (1999) Mood_{evidential}P, in the absence of other indications, is that the speaker assumes responsibility for a sentence uttered (Cinque 1999). This speaker can be represented by a first person feature in the Mood_{evidential}⁰ in the left periphery of main

clauses. The Speaker represented in $\text{Mood}_{\text{evidential}}^0$ provides an anchor for the temporal interpretation of sentences by tying it to the moment of utterance or speech time, which is the reference point for the temporal interpretation of a sentence (see e.g., Giorgi and Pianesi 2004). Similarly, the spatial interpretation of a sentence is determined with respect to the spatial orientation of the speaker (at least in the Speaker-centered readings under consideration here).⁴

Ross bases his argument for the grammatical representation of the speaker on the fact that *self*-forms (30a,b,c), (31b) and (32a) take this speaker as their antecedent:

- (30) a. Jules said that as for himself he wouldn't be invited.
 b. I said that as for myself I wouldn't be invited.
 c. As for myself, I won't be invited.
 d. *As for himself, he won't be invited.
- (31) a. I told Monk that composers like himself are a godsend.
 b. Composers like myself/*himself are a godsend.

The following contrast, from (Cantrall 1974:159), likewise suggests an analysis in terms of the speaker:

- (32) a. According to Mary, John is a little taller than herself.
 b. *As for Mary, John is a little taller than herself.

The sentence in (32a) involves two speakers: the first speaker is the person uttering (32a) in its entirety; the second speaker is the person to whom the sentence *John is a little taller than herself* is ascribed by the first speaker: *Mary*. The expression *according to* identifies its complement DP *Mary* as the speaker of the sentence *John is a little taller than herself*. As a result, *herself* in (32a) can take *Mary* as its antecedent, although this DP does not c-command *herself*, and is not even an argument of the sentence, but rather the speaker. The expression *as for*, by contrast, identifies the topic of the sentence that follows. Only when the topic is first person (as in (30c)) will it be identical with the speaker, for obvious reasons (or in a case of reported speech, as in (30a)).

It is important to note that we do not believe that Condition A is involved in these sentences. Rather, they involve *self*-forms which are lo-

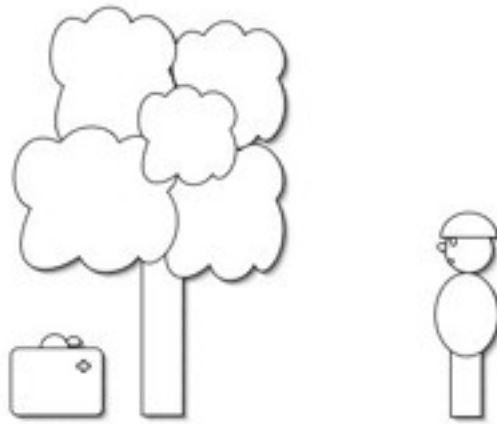
⁴The semantic literature contains extensive discussion of various other so-called indexical items, such as *here, there, this, that, today, now, yesterday, tomorrow, actual, present, ago, local, current, mom, dad*, etc. See Kaplan (1989), Nunberg (1993), Perry (1997), Tsoulas and Kural (1999). In addition, first and second person personal and possessive pronouns are themselves also deictic. This means that the text claim that the speaker anchors other deictic elements can only be partially true, in so far as the speaker itself needs to be deictically anchored to a context of utterance. Following Tsoulas and Kural, we shall assume that the Speaker functions as an operator binding indexical pronouns as variables, as well as variables contained in various types of spatial and temporal deictic expressions.

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gophors. In the Dutch equivalents of the above examples, the third person forms consistently translate as *hem/haarzelf*, not as *zichzelf*. Vanden Wyngaerd (1994) argues that the former is a logophor, whereas *zichzelf* is unambiguously anaphoric. Still, it is a requirement on logophors that they refer to a center of consciousness, i.e., a Speaker (Clements 1975, Sells 1987).

Let us return to the observer-centered interpretation of locative PPs, in particular in the example in (17), repeated as (33).

- (33) The suitcase is standing behind the tree.



A tree, contrary to a car, does not have a {front-back} dimension. The back or the front of the tree are entirely determined by the observer. We propose that this speaker/observer perspective is formally represented as in (34): the Speaker binds AxPart.

- (34) $[_{\text{Evid}} \mathbf{Sp}_{1P.SG} [\text{The suitcase is standing } [_{\text{Place}} \text{be } [_{\text{AxPart}} \text{hind}_{\text{Speaker}} [_{\text{Kase}} \emptyset [_{\text{D}} \text{the tree }]]]]]]$

The resulting interpretation of (34) is one in which the front of the tree is the location which the speaker identifies as the region in front of the tree.

Recall from the pictures in (16)-(17) above that, in addition to the perspective of the person standing, one can also look at the scene from a third onlooker perspective (cf. (18)). How come the Speaker can take various different observer perspectives on a scene? To account for this fact, we assume the following:

- (35) *Assumption about Speaker perspective*
 The Speaker is like the omniscient author of a novel, and may take any perspective on a scene (s)he chooses, including that of the subject/person depicted.

Note that AxPart can have two values under this analysis: it can either function as a Probe for Agree with the AxPart features of the object of the preposition as its Goal; or it can function as a variable for the Speaker, which we conceive of as an operator (cf. note 4; Tsoulas and Kural 1999). It is possible to view these two values of AxPart as independent paradigmatic realisations of this functional category. It is tempting however to view them as two realizations of the same underlying morpheme. Under this view AxPart Probes for features in the complement of the preposition, and Agrees when such features are found in the Goal. When the Agree relation does not obtain, the derivation does not crash, but instead AxPart receives a default interpretation as a variable, which in turn must be bound by the Speaker.

3. Biding in *snake*-sentences

In this section, we will first present the gist of our proposal. Section 3.1 will succinctly show how the assumptions about the syntax of AxParts introduced in the previous section manage to derive the three sets of data we discussed in relation to *snake*-sentences in §1: perspective, the nature of the location, and quantifier-binding. In §3.2, we will develop some extensions of the analysis regarding perspective and location in *snake*-sentences.

3.1. The proposal in a nutshell

3.1.1. (b/B)inding

With this much independently motivated machinery in place, we can now turn to the lack of complementary distribution between *self*-form and pronoun in *snake*-sentences. Let us first make an additional assumption about the axial features of *self*-forms and pronouns:

- (36) *Assumptions about Axial parts, pronouns and -self.*
- a. pronouns lack grammatical axial dimensions.
 - b. *self* contributes grammatical axial dimensions to the pronominal form it attaches to.

What these assumptions amount to is to say that the complex *self* anaphor has intrinsic AxParts, like a car (cf. (28)), while the pronoun *him* lacks intrinsic AxParts, and therefore is more like a tree (cf. (34)). The consequence of this view is that the morphologically complex reflexive is also semantically more complex than the simplex pronoun *him*. Although this does not reflect the standard view on anaphors, this conclusion is happily in line with standard assumptions about compositionality. The morphological complexity of the *self*-form is mirrored by its greater semantic complexity: *himself* = *him* + ‘axial’ *self*. The idea that the complex anaphor *himself* is semantically endowed with axial dimensions is furthermore in line with

observations by Postma (2002), who argues that English *self* diachronically derives from a word for body, as do many anaphors crosslinguistically (Faltz 1977, Pica 2002). In line with Postma, we do not take the morpheme *self* contained in the complex anaphor to refer to a literal body. Rather, we claim that the *self*-form has grammatical AxParts. By contrast, the morphologically simplex pronoun lacks Axial dimensions. As a result, in the context of locative prepositions, the pronoun involves a more abstract reference, while the complex anaphor resembles a physical entity with its own dimensions.

The assumption in (36b) does not mean that *self* exclusively expresses axial dimensions. Rather, we claim that *self* is semantically rich enough to provide the semantics of axial dimensions in the appropriate syntactic context. Outside of the context of spatial prepositions, the *self* morpheme can also express nonspatial properties such as temporal or modal dimensions. These can be brought out in complex DPs such as in the temporal *my previous self*, or the modal *John's political self*. The Agree relation between AxPart and the *self*-form plays a role similar to that of the modification by adjectives: it brings out the spatial dimensions ensconced in the semantics of *self*, emphasizing bodily aspects when the antecedent is animate.

Let us now see how the syntax of AxParts, with its object-centered and observer-centered configurations, can be related to the syntax of *snake*-sentences. We claim that Operator-binding of AxPart by the Speaker derives the *observer-centered* interpretation involving the pronoun:

- (37) *Observer-centered interpretation:*
 $[_{\text{Evid}} \mathbf{Sp}_{1P.SG} [_{\text{IP}} \text{John saw a snake } [_{\text{Place}} \text{near } [_{\text{AxPart}} \emptyset_{\text{Speaker}} [_{\text{Kase}} \emptyset [_{\text{D}} \text{him}]]]]]]]]$

By contrast, an Agree-relation between AxPart and the axial dimensions of the *self*-form derives the *object-centered* interpretation, involving a transparent domain for (b/B)inding:

- (38) *Object-centered interpretation:*
 $[_{\text{Evid}} \mathbf{Sp}_{1P.SG} [_{\text{IP}} \text{John/ Everyone saw a snake } [_{\text{Place}} \text{near } [_{\text{AxPart}} \emptyset_{\{\text{front-back}\}} [_{\text{Kase}} \emptyset [_{\text{D}} \text{himself}_{\{\text{front-back}\}}]]]]]]]]$

The syntactic domains for *self*-form and pronouns in (37) and (38) can now be related to the relevant observations about variable binding and Binding. The configuration in (38) is straightforward from a Binding or variable binding perspective: the domain for the *self*-form simply is the minimal domain with an accessible subject, i.e., the IP that has *John* as a subject. The *self*-form is equally accessible for a quantified subject such as *everyone*, which can bind it.

The syntactic domain in (37), however, when AxPart is bound by the Speaker as a variable, is very different. The Speaker-bound AxPart variable can be viewed as a second occurrence of Speaker within the same sentence.

The representation in (39)-(40) then to all intents and purposes involves two occurrences of Speaker. As such, the configuration of (39) is identical to that of two consecutive sentences in the discourse as in (40), which also involve two Speakers in their representation.

- (39) $\left[\begin{array}{l} \text{[Evid Speaker}_{1P.SG} \text{ Everyone saw a snake [Place near [AxPart } \emptyset \text{ Speaker} \\ \text{[Kase } \emptyset \text{ [D them/ *him]]]]]] \end{array} \right]$

We assume that the Speaker creates an opaque domain for variable binding in (39). The analysis in (48) also derives the absence of Condition B effects in (37): the Speaker *a fortiori* creates an opaque domain for the application of condition B of the binding theory as well.

Variable binding of *him* by *everyone* is blocked by an intervening Speaker in the same way as binding of *he* by *everyone* is blocked in (40).

- (40) $\left[\begin{array}{l} \text{[Evid Speaker}_{1P.SG} \text{ Everyone came in.]} \\ \text{[Evid Speaker}_{1P.SG} \text{ They/ *He sat down.]} \end{array} \right]$

This amounts to saying that c-command is a necessary, but not a sufficient condition for variable binding. Kratzer (1998; 2006) presents some independent evidence that this is indeed the case. She observes that (41) is ambiguous between a strict and a sloppy reading:

- (41) Only I got a question that I understood.

Under the strict reading, the second occurrence of the first person pronoun refers to the speaker: nobody else got a question that I understood. On the sloppy reading, the second *I* has a bound variable interpretation: nobody has the property of being an *x* such that *x* got a question that *x* understood. Surprisingly, the examples in (42) do not reveal this ambiguity: they only have the strict reading.

- (42) a. Only I think that Mary won't come if I invite her.
b. Only I got a question that you thought I could answer.

It looks like the variable binding relationship between the first person matrix subject and the embedded first person pronoun is blocked by an intervening subject of a different person. The intervention effect disappears if the person features of the intervener match those of the bound pronoun:

- (43) a. Only Sam thinks that Mary will not come if he invites her.
b. Only I got a question that I thought I could answer.

These sentences are again ambiguous between a strict and a sloppy reading. We propose that the same happens in a case like (39): variable binding of the pronoun is blocked by an intervening speaker with a different person feature.

A prediction made by this analysis is that the pronoun in a *snake*-sentence can never function as a bound variable, not even in a case like (1), repeated below, with a referential DP as a subject:

- (44) Tony saw a snake near him.

Following Reinhart (1983), the relationship between *Tony* and the pronoun must therefore be one of coreference, not binding. This in turn entails that sloppy readings should be impossible in (44). This, however, appears not to be the case, i.e., (45) does have a sloppy reading:

- (45) Tony saw a snake near him, and Bill did too.

However, there are other cases where the absence of variable binding nevertheless triggers sloppy readings, as in the following example (Tomioka 1999, Sauerland 2007).

- (46) The policeman who arrested John insulted him, and the one who arrested Bill did, too.

Tomioka (1999:223) argues that sloppy identity can be licensed in structural configurations in which variable binding is ordinarily blocked. He suggests that not all pronouns with a sloppy interpretation are bound variables, but that instead sloppy readings under ellipsis can emerge when the pronouns are construed as E-type pronouns. We assume that the sloppy reading in a case like (45) results from the same mechanism.

3.1.2. Perspective

The analysis in (37) and (38) also provides an explanation for Cantrall's observations about the relevance of perspective in (9), repeated here as (47). In these sentences, the speaker-orientation or the subject-orientation is brought out by the different parentheticals *as I/they looked at it*.

- (47) a. They placed their guns, as they looked at it, in front of themselves/*them.
 b. They placed their guns, as I looked at it, in front of *themselves/them.

The relevant configurations for these sentences are as follows:

- (48) a. *Object-centered interpretation*
 [They placed their guns, as they looked at it, [_{Place} in [_{AxPart} front_{front-back} [_K of [_D themselves_{front-back}]]]]]]
 b. *Speaker/Observer-centered*
(i.e. speaker centered) interpretation
 [_{Evid} **Speaker**_{1P.SG} [They placed their guns, as I looked at it, [_{Place} in [_{AxPart} front_{Speaker} [_{Kase} of [_D them]]]]]]]]

In (48a), AxPart agrees with the axial dimensions provided by the complex anaphor *himself*. This forces an object-centered perspective. Since the object in question is an anaphor bound by the subject, the object-centered perspective in fact coincides with that of the subject. The parenthetical *as they looked at*, with a subject identical to that of the matrix clause, makes the subject-centered perspective explicit, and it is consequently incompatible with the pronoun, which triggers a speaker/observer centered perspective. In (48b), the simplex pronoun *him*, lacking axial dimensions or features, blocks an Agree relation with AxPart. As a result, the Speaker will bind AxPart as a variable, yielding Speaker perspective. The parenthetical *as I looked at it* makes this perspective explicit; it is incompatible with the *self*-form, which triggers subject perspective in the manner described above.

Another set of examples involving a parenthetical making the perspective explicit can be adduced to make a rather more subtle point: the perspective of the speaker and the perspective of a first person subject are not always necessarily identical. A close analogue to (47) discussed above is provided by the examples in (49) (from Cantrall 1974:148-49).

- (49) a. I put the guns, as I looked at it then, in front of myself/?*me.
 b. I put the guns, as I look at it now, in front of ?*myself/me.

The example reveals a subtle difference between a first person subject and the Speaker.⁵ In (49a), both the parenthetical and the main clause are in the past tense. As a result, the first person in the parenthetical is spatiotemporally identical to the first person in the main clause, and distinct from the Speaker of the sentence, who is necessarily linked to the moment of utterance. This is schematically represented in (50), where subscripted ‘Present’ or ‘Past’ indicate the relevant stages of the speaker or the first person pronoun:

- (50) [Evid **Sp**_{Present} I_{Past} put the guns, as I_{Past} looked at it then, [Place
 in [AxPart front_{front-back} [K of [D myself_{front-back}]]]]]

In (49a), the *self*-form is licensed because AxPart Agrees with the dimensions provided by *-self*. The result is an object-centered interpretation of

⁵Lakoff (1996:92) discusses a similar case where a first person pronoun and the speaker do not coincide. He observes that the sentences in (i) “violate the condition that first person pronouns refer to the speaker.”

- (i) a. If I were you, I’d hate me.
 b. If I were you, I’d hate myself

In particular, the second occurrence of the first person pronoun refers to an aspect of the person (the *Subject-of-I* in Lakoff’s terms) in a hypothetical world, whereas the first occurrence of the pronoun refers to the speaker (both the *Subject-of-I* and the *Self-of-I* in the real world). What we note as I_{Past} in (50) can be understood in similar terms, i.e., as an aspect of the person different from, but at the same time similar to, the speaker.

the spatial relationships. Since the object is an anaphor bound by the subject, the object-centered perspective coincides with that of the subject, which, as we said, is subtly different from that of the speaker. Let us now examine why the pronoun is dispreferred in (49a). The pronoun cannot provide AxPart with the relevant dimensions for an Agree relation. Therefore, AxPart must be bound by present Speaker perspective, as represented in (51):

- (51) *?_{[Evid Sp^{Present} I_{Past} put_{Past} the guns, as I_{Past} looked at it then,}
 [Place in [AxPart front_{Speaker-present} [K of [D me]]]]]

This ‘present first person speaker’ perspective now clashes interpretively with the perspective provided by the ‘past’ first person observer in the parenthetical, which forces a past first person perspective. It is this clash between two contradictory perspectives, the present first person speaker of the main clause and the past first person observer of the parenthetical, that makes the pronoun bad in this context. At this point, one might raise the question why the speaker, being omniscient, cannot assume a past (i.e., I_{Past}) perspective (see §3.2.1 for an example of such a case). The answer has to be that a speaker is necessarily grammatically present.⁶

In (49b), the pronoun is also licensed via present speaker perspective. The relevant representation is as follows:

- (52) _{[Evid Sp^{Present} I_{Past} put the guns, as I_{Present} look at it now,}
 [Place in [AxPart front_{Speaker.present} [K of [D me]]]]]

The parenthetical in (52) is in the present tense. As a result, the ‘present’ first person pronoun in the parenthetical is spatiotemporally identical to the ‘present’ first person Speaker of the sentence (though distinct from the ‘past’ first person subject of the main clause). The Speaker in Evid binds the AxPart variable, creating an opaque domain for Binding of the pronoun.

Let us finally examine why the *self*-form is dispreferred in (49b), representing the relevant configuration as in (53):

- (53) *?_{[Evid Sp^{Present} I_{Past} put the guns, as I_{Present} look at it now,}
 [Place in [AxPart front_{front-back} [K of [D myself_{front-back}]]]]]

In (53), the *self*-form Agrees with AxPart in the relevant dimensions. The result is an object-centered interpretation of the spatial relationships. Since the object is an anaphor bound by the subject, the object-centered perspective coincides with that of the subject. The tense of the main clause is in the past: this entails that the first person subject is also situated in the past, as is, via Binding, the spatial relationship between that first person

⁶The use of the historical present to describe past events may be taken to confirm this claim: although there is a metaphorical shift from the present to the past, the speaker pretends that the past is now, and views the past events as if they were present events. It therefore seems that the speaker is always grammatically present.

subject and the guns. The perspective on the spatial relationship is entirely determined by the ‘past’ first person subject. This ‘past’ perspective on the spatial relationship now conflicts with the perspective imposed on that spatial relationship by the ‘present’ first person subject of the parenthetical. Since both first person subjects coincide referentially, their past and present perspectives collide, making the *self*-form bad in this context.

3.1.3. The nature of the location

Let us now turn to the third property of *snake*-sentences which we identified above, besides perspective and variable binding, namely, the fact that the interpretation of the location slightly varies with the use of the reflexive or the pronoun. This was illustrated in (11) above, repeated here:

- (54) a. Mary kept her childhood dolls close to her. (= proximity/vicinity)
 b. Mary kept her childhood dolls close to herself. (= against her body)

The configurations involved for (54a) and (54b) can be represented as follows:

- (55) a. *Object (=subject)-centered interpretation:*
 Mary kept her childhood dolls
 [Place close [AxPart \emptyset_{dim} [K to [D herself $_{dim}$]]]]
 b. *Speaker/Observer-centered interpretation:*
 [Evid **Sp**_{1P.SG} Mary kept her childhood dolls [Place close [AxPart $\emptyset_{Speaker}$ [K to [D her]]]]]]

Our account of contrasts such as those in (54) primarily relies on an inherent difference in the meaning of pronouns as opposed to *self*-forms (see (36) above). In (55a), the axial dimensions provided by *self* account for a strictly locative interpretation: the dolls must be in contact with Mary’s body. In contrast, the pronoun lacks AxParts and therefore spatial dimensions. As a result, the non-agreeing AxPart variable is bound by the Speaker. The Speaker’s perspective determines a broad and rather abstract interpretation of ‘general vicinity.’ The same analysis applies to (12), repeated here for convenience:

- (56) a. Zelda examined the floor under herself.
 (*She was standing on the lawn in front of her building)
 b. Zelda examined the floor under her.
 (She was standing on the lawn in front of her building)

The sentence involving the *self*-form requires an Agree relation between the AxPart features of *under* and those of the floor, defining a close locative relation where the floor must be in contact with Zelda. The sentence with the pronoun receives an analysis like (55b), with the Speaker binding the

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AxPart variable allowing for a much more abstract interpretation: Zelda's home rather than her physical location at the reference time.

More cases that can be seen as instantiating a difference in the nature of the location include the ones in (57), from Chomsky (1965:146-147; his judgements).

- (57) a. I pushed it away from me/*myself (Chomsky 1965:146-147)
b. I drew it toward me/*myself

Cantrall (1974:44) reports these cases, but then goes on to show that in what he calls 'emotional contexts', the *self*-forms become available. He argues that this is so because the author or reader sees himself as the character and thus takes the first person subject to be himself: the speaker projects himself into the character.

- (58) a. I wanted desperately to push it away from myself
b. I was intent upon drawing it to myself
c. I pushed her away from myself before temptation got too strong.
d. I drew her toward myself madly, without a moment's thought.

However, we believe that these cases fairly straightforwardly illustrate a familiar property of *self*-forms, viz. their preference for an interpretation involving physical contact. In Cantrall's sentences (58), there is contact or intended contact between the subject/*self*-form, and the Theme that is being pulled or pushed. Even if there is pushing involved, i.e., movement away from the body, that movement seems to initiate in a starting position where there is physical contact.

A prediction following from this analysis is that we expect the pronoun to be preferred in cases where the prepositions meaning is still spatial, but where the location referred to is more abstract or metaphorical, rather than physical. An interesting minimal pair is given in (59):

- (59) a. John put that episode/it behind him(*self).
b. John put the box behind him(self).

In (59a), the *self*-form is dispreferred, since in this case, it is hard to imagine a physical dimension of John behind which the episode can be put.⁷ The intended location is more abstract than John's concrete axial dimensions. As a result, a form will be preferred which lacks axial dimensions, i.e., a pronoun. As (59b) shows, the *self*-form is possible in those cases where the

⁷We prefer to be cautious and use 'dispreferred,' as it is possible to find cases on the Internet involving the *self*-form from what we take to be perfectly native English contexts:

- (i) "I'm amazed at how well he was able to put it behind himself and just focus on rugby," he said. www.abc.gov.au/news/items/200503/1322994.htm?canberra

self-form can be interpreted as involving a physical location at the back of John. As a result, an Agree relation between AxPart and *himself* can obtain in (59b), yielding an object-centered interpretation referring back to the subject via Binding. Still, a configuration licensing the pronoun *him*, with the AxPart variable bound by the Speaker, is equally possible.

Similar considerations apply to (60), from (Bouchard 1983:19):

(60) John always keeps his wits about him/*himself.

In (60), there is no dimension of John involved, as it is impossible to ascertain which side, bodypart, or even metaphorical ‘position’ John’s wits are located at. The location involved is therefore much more abstract than can be accommodated by John’s axial dimensions. The pronoun is therefore preferred in (60) precisely because it lacks axial dimensions. As a result, the AxPart variable of locative *about* is bound by the Speaker.

3.1.4. Absence of perspectival and location differences

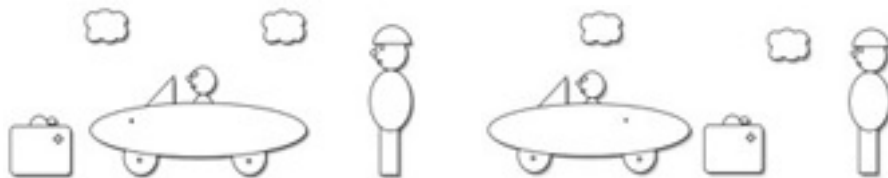
At this point we would like to return to an observation we made earlier, which is that the effects of perspective (extensively discussed by Cantrall 1974) and physical location (Kuno 1987) do not arise in each and every context. For example, the classical *snake*-sentences such as (61) involving *near* do not seem to reveal these differences between a more abstract and a concrete body-centered location, nor does there seem to be a difference involving perspective between the anaphor and the pronoun.

(61) John saw a snake near him/himself.

However, this is not entirely unexpected. For perspective differences to arise, one needs a context where subject and observer perspective are different. This can be illustrated with the sentence in (16), repeated here:

(62) The suitcase is standing behind the car.

- | | |
|--|--|
| <p>A. Observer-centered frame
<i>Perspective of the person standing:</i>
invisible side of car</p> | <p>B. Object-centered frame
<i>Car perspective:</i>
rear side of car</p> |
|--|--|



We already noted that a difference between an observer-centered frame can only arise with an object that has an inherent front and back, such as

a car, but not a tree. In addition, the preposition at issue must also refer to a specific axial region of the object (e.g., *behind*, *in front of*, but not *near* or *around*, as they involve all dimensions, which excludes the possibility of a conflict of perspectives). Finally, the two perspectives only yield different spatial interpretations under particular spatial conditions, such as the one depicted in (62). But now consider an alternative situation, where the orientation of the car is reversed: in such a case, object-centered and observer-centered perspective coincide. In a similar way, the perspectives of the subject and the Speaker will coincide in the vast majority of cases, and it takes special conditions to bring out the difference in perspective. One such special context is that of pictures, where there exists a systematic perspectival difference between that of an external onlooker, and that of a character depicted in the picture. We turn to a discussion of such cases in §3.2.1 below.

As we observed in the previous paragraph, prepositions such as *near* or *around* cannot give rise to a perspectival difference, because they involve any (*near*) or all (*around*) dimensions of their complement. But given a proper context, it is possible to construct cases where a difference can be brought out with respect to the nature of the location, as in (63):

- (63) a. When he woke up, John found a rope around himself.
He had been tied up/*It described a neat circle 4 meters in diameter.
- b. When he woke up, John found a rope around him.
He had been tied up/It described a neat circle 4 meters in diameter.

In (63a), the axial dimensions provided by John's *self* (i.e., his body) give rise to a "physical contact" reading, as described by Kuno (1987). In the case of the pronoun in (63b), the non-agreeing AxPart variable is bound by the Speaker. The Speaker's perspective determines a more abstract interpretation of what counts as an appropriate location around John.

A rather more special case is that of the preposition *with*. In its locative use, *with* never seems to allow for the *self*-form:

- (64) John took a suitcase with him(*self)

We would like to argue that this correlates with the fact that the axial dimension of *with* was undefined (as stated in (21) above). Since it is impossible to determine the spatial relationship between John and his suitcase in (64), it is equally impossible to have an Agree relation between the *self*-form and the AxPart of *with*. The only option that remains open is to have AxPart bound by the Speaker, triggering the use of the pronoun. When the locative relationship cannot be axially determined, an Agree relation between AxPart and the prepositional complement fails.

3.2. Extensions of the analysis

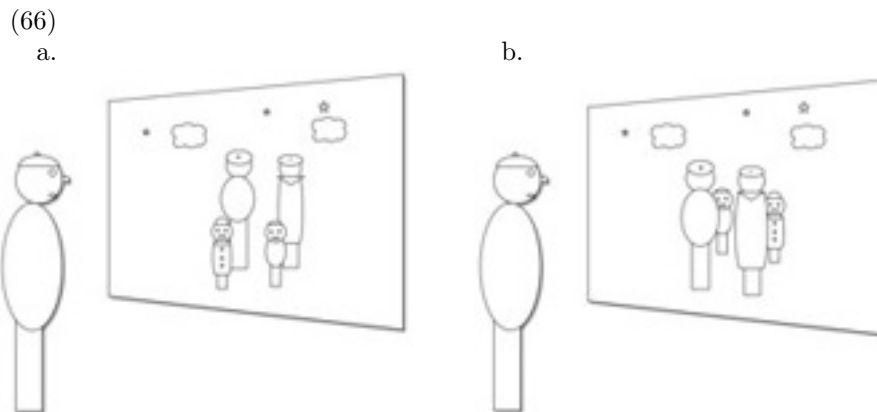
In this section, we would like to address a number of varied data to illustrate that the analysis proposed above is on the right track. We will also propose further motivation for some of the assumptions adopted above.

3.2.1. Pictures: whose perspective is it anyway?

Picture contexts provide an interesting environment where differences between observer-centered and object-centered perspectives can be brought out fairly easily. The observer in this case takes the form of someone looking at the picture, whereas the object-centered perspective is typically that of a character depicted in the picture. Cantrall (1974:146ff) discusses an example where we are asked to imagine a situation in which we look at a picture representing a group of adults and a group of children.

- (65) The adults in the picture are facing away from us,
with the children placed behind them.

The sentence in (65) is ambiguous: the children may be located behind the adults from the adults' point of view, i.e., they may be standing in the foreground of the picture, as depicted graphically in (66a). Alternatively, the children may be standing behind the adults from the point of view of the observer viewing the picture, and therefore in the picture's background, as in (66b):



Now consider (67):

- (67) The adults in the picture are facing away from us,
with the children placed behind themselves.

This is unambiguous: only the adults' point of view is possible here, i.e., the children are in the picture's foreground behind the backs of the adults, and therefore in between the adults depicted and the picture's observer,

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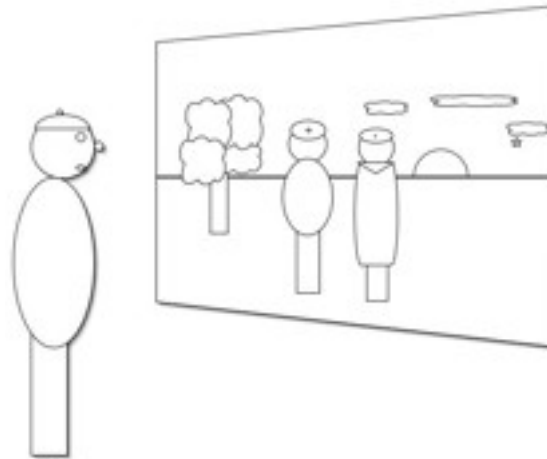
as in (66a). The anaphor necessarily triggers an interpretation where the orientation and the dimensions of the subject are the crucial factor. In our analysis, this is captured by the fact that the Agree relation between the *self*-form and AxPart forces the subject-oriented interpretation, excluding any observer-centered perspective.

How come the pronoun permits both perspectives in (65)? Recall we have assumed in (35) that the speaker/observer is like the omniscient author of a novel, and can take whatever perspective (s)he chooses, including that of the subject/person depicted. As a result, the observer can take the adults' perspective in (65), with the children behind the adults/ observer as in (66a) or the observer can keep his original point of view, as in (66b).

This now can also provide an explanation for the ungrammaticality of the *self*-form in (68)(example from Cantrall 1974:146ff).

- (68) The adults in the picture are facing east, with the rising sun behind them/*themselves.

(69)



The *self*-form requires that the locative interpretation of *behind* involves an object-centered perspective, i.e., the dimension and orientation of the adults. Since the sun rises in the East, the adults involved cannot at the same time be facing the sun and have it at their backs. The use of the pronoun does not require an object-centered interpretation, therefore the sun can be behind the adults from the perspective of the observer who is looking at the backs of the adults in the picture.

In picture contexts, we also expect there to be left-right differences depending on which perspective is taken, that of someone looking at the picture or that of a person depicted in the picture. Such left-right confusions are in fact common enough that they have led art historians to adopt strictly unambiguous terminology: the terms 'proper left' and 'proper right' refer

to the left or right from the perspective of the person that is being described by the art historian. In the famous Bronzino portrait in (70), the little boy, Giovanni, is standing to the left of Eleonora from the point of view of the observer, but he is to the right of her from Eleonora's perspective.

(70)



Agnolo Bronzino (1503-1572)
Eleonora of Toledo and Giovanni de' Medici
c.1544, Uffizi

In the following description of the portrait, object-centered perspective is explicitly indicated by the use of the relevant terminology (Urry 1998):

- (71) 'Eleonora curves her proper right hand protectively around her son's shoulder. He leans slightly against her, resting his proper left hand on her lap like a plump starfish.'

Let us now discuss the Bronzino portrait in the light of the reflexive-pronoun contrasts that we have been describing. We expect the perspectival difference concerning left and right to correlate with the anaphor-pronoun distinction, such that the reflexive would represent object-centered perspective (i.e., proper left/right), and the pronoun observer perspective. This prediction is borne out:

- (72) a. Eleonora has positioned Giovanni to the right/*left of herself.
b. Eleonora has positioned Giovanni to the right/?left of her.

As (72a) shows, the anaphor only allows for Eleonora’s perspective, in which Giovanni is seated to the right of her body. The pronoun in (72b) permits both the point of view of the observer facing the portrait, and that of the observer identifying with Eleonora’s proper right. In all of these cases, we propose the same analysis as in (37)-(38) above, the only difference being that we are not dealing with a single preposition, but a more complicated structure:

(73) [Place to [AxPart the left [K of [D her(self)]]]]

Agreement of the prepositional AxPart with the *self*-form involves an object-centered perspective, and Binding brings about the perspective of the subject of the sentence only.

(74) [cf. (72a)]
Object-centered: the object is anaphoric with the subject → subject perspective
 Agree-relation between AxPart and *self*-form; domain transparent for binding
 [Evid **Sp**_{1P.SG} Eleonora has positioned Giovanni [Place to [AxPart the right_{left-right} [Kase of [D herself_{left-right}]]]]]]

(75) [cf. (72b)]
Speaker/Observer-centered
 Speaker binds AxPart as a variable; variable creates opaque domain for binding
 [Evid **Sp**_{1P.SG} Eleonora has positioned Giovanni [Place to [AxPart the right/left_{Speaker} [Kase of [D her]]]]]]

The use of the pronoun reflects variable binding of AxPart by the Speaker of the sentence represented in Mood_{evidential}, and as a result derives observer-centered perspective.

3.2.2. Identity in *Self*-forms

In 3.1, we argued that variation in the interpretation of the location, which is triggered by the use of the reflexive or the pronoun, can be reduced to the fact that the morpheme *self* provides AxPart features which the prepositional AxPart Probe can Agree with. We do not take the morpheme *self* contained in the complex anaphor to refer to a literal animate body, but rather to involve grammaticalized axial dimensions.⁸ What this claim amounts to in semantic terms is that *self*-forms are predicted to be semantically more complex than pronouns, a direct consequence of the principle of compositionality. The minimal kind of semantics that an NP may have is

⁸The idea that *self*-anaphors are both morphologically and semantically more complex than pronouns is in line with ideas about Binding that we have developed elsewhere (Rooryck and Vanden Wyngaerd 1998; 1999).

that of functioning as a semantic variable. Pronouns can certainly function in such a way, e.g., when bound by a quantifier, or even when bound by a proper name (Reinhart 1983; Chierchia and McConnell-Ginet 1990:138).

- (76) a. Charles thinks that he is intelligent.
 b. Charles [x thinks that x is intelligent]

Apart from that, a pronoun can refer independently to a contextually given individual. A logical consequence of this compositional view is that semantically *self*-forms cannot be mere variables bound by their antecedent. Their contribution to the semantics, we argue, is that of providing spatial dimensions. In the remainder of this section we shall provide some more evidence for the view just developed.

A striking fact about locative prepositions is that, in contrast to many verbs, they cannot be reflexive predicates (in the sense of Reinhart and Reuland 1993). This can be seen in the predicative contexts involving BE, as in the following examples:

- (77) a. *The table is on the table/itself/it.
 b. *John is under John/himself/him.
 c. *The box is in the box/itself/it.

We propose that this restriction be formalized as follows:

- (78) *The Total Identity Constraint (TIC)*
 * [NP₁ [P_{Loc} NP₂]]
 where the reference of NP₁ and NP₂ is totally identical

We shall not go into the question here of what ultimately underlies the TIC. Intuitively, the sentences in (77) describe situations which are spatially impossible. This spatial or conceptual impossibility may be at the heart of the TIC, but alternative views are conceivable as well.

As far as the examples in (77) are concerned, this is where the story could end, but the situation gets more interesting in cases involving dynamic verbs. Whereas (77) could be argued to be spatially impossible under any kind of interpretation of NP₁ and NP₂, things are different with dynamic verbs. Here, the combination of spatial movement on the one hand, and a slightly different interpretation of the reference of NP₁ and NP₂ on the other, may give rise to acceptable interpretations. A case in point is provided by the examples in (79) (see also Cantrall 1974:46):

- (79) a. The tower fell on itself. (i.e., it didn't tip over)
 b. The earth revolves around itself.
 c. John tripped over himself.
 d. Susan withdrew into herself.

Assuming these verbs to be unaccusative, before movement to subject position the relevant DPs constitute the external arguments of the prepositions

on, around, over and *into*. As a result, all of these cases instantiate the configuration proscribed by the TIC: $[NP_1 [P_{Loc} NP_2]]$. A reflexive relationship involving the whole undifferentiated object is spatially impossible in these sentences: if A falls on B (or revolves around, trips over, withdraws into B), then A is necessarily distinct from B. This restriction can be circumvented, however, by distinguishing parts of A: one part of A can fall on, revolve around, trip over, or withdraw into another part of A. This is the type of reflexive relationship that the sentences in (79) express.

We propose that the parts necessary for assigning a reflexive interpretation in these contexts are the axial parts of the object. In (79a), the *self*-form provides the vertical top-bottom axis along which parts of the tower can fall in on other parts of itself.

- (80) ... fell [the tower [Place on [AxPart $\emptyset_{top-bottom}$ [K \emptyset [D itself $_{top-bottom}$]]]]]

Similarly, in (79b), the earth is seen as having a vertical axis around which the other parts of the earth revolve; in (79c) John trips over a specific body part of his; and some part of Susan withdraws into another, though this time the parts are metaphorical or mental in nature. In all cases, an object-centered reading results from a configuration in which AxPart Agrees with the axial dimensions provided by the *self*-form. Semantically, *self*-forms constitute a unique way to get around the TIC because of the way they refer: rather than being mere variables bound by their antecedent, they contribute spatial dimensions. Since pronouns lack axial dimensions, we predict that in (79) the pronoun *it* should be impossible; this prediction is borne out:

- (81) a. *The tower_i fell on it_i.
 b. *The earth_i revolves around it_i.
 c. *John_i tripped over him_i.
 d. *Susan_i withdrew into her_i.

Simplex pronouns such as *him* or *it* cannot circumvent the TIC by exploiting the possibilities of slightly different reference that the AxParts of *self*-anaphors offer.

The presence of a *self*-form is a necessary, but not a sufficient condition for circumventing the effects of the TIC. This is shown by the ungrammaticality of the corresponding stative copular sentences as in (82):

- (82) a. *The tower is on itself.
 b. *The earth is/sits around itself.
 c. *John is over himself.

In addition to a *self*-form, what is needed to circumvent the TIC is a dynamic verb. In the sentences in (79), there is a necessary relationship between the successive temporal stages of the activity expressed by the verb

on the one hand, and the successive spatial parts of the object affected by this activity on the other. One can interpret this relationship as a case of what Tenny (1987) calls ‘measuring out.’ The location provided by the preposition combined with the dynamism expressed by the verb, provide a Path along which different spatial parts of the object, or different locations of parts of the object, can be distinguished.

3.2.3. Dutch

Let us now turn our attention to *snake*-sentences in Dutch. The simplex reflexive *zich* occurs in *snake*-sentences such as (83a). It is important to point out that many varieties of Dutch also feature a destressed pronoun in this position as in (83b), very similar to English. We will indicate this variety by the # sign:

- (83) a. Jan zag een slang naast zich.
John saw a snake near REFL
 ‘John saw a snake near him’
 b. Jan zag een slang naast #’em/*HEM
John saw a snake near CL/ HIM
 ‘John saw a snake near him’

These cases are interesting because *zich* is morphologically different from both English *him* and *himself*. Both *him* and *zich* are morphologically simplex, but *zich* is an anaphor, like English *himself*. *Zich* however differs from *himself* in that it is morphologically simplex.

(84)

	English		Dutch		
	himself	him	zich	hem	zichzelf
Simplex	–	+	+	+	–
Anaphor	+	–	+	–	+

We therefore expect that the behavior of *zich* in *snake*-sentences neither fully matches that of *him*, nor that of *himself*. This expectation is carried out.

First of all, it seems that *zich* behaves just like *himself* when it comes to the interpretation of the nature of the location as well as the perspective adopted. The sentence (12a) is only compatible with a concrete location: *de verdieping onder zich* ‘the floor under herself’ can only refer to the floor Zelda is standing on. The more abstract locative relationship between Zelda and the floor she is looking at, when the floor is not physically under Zelda, as when she is standing in front of the building she lives in, cannot be expressed by the use of the simplex reflexive *zich*. Predictably, the pronoun

haar/d'r ‘her’ accommodates both readings in those dialects that feature it, just like in English.

- (85) a. Zelda keek naar de verdieping onder zich.
Zelda looked at the floor under REFL
 ‘Zelda examined the floor under herself’
 (She was standing on the landing of the stairs/
 She was standing on the lawn in front of her building)
- b. #Zelda keek naar de verdieping onder haar/d'r.
Zelda looked at the floor under her/her.CL
 ‘Zelda examined the floor under her’
 (She was standing on the landing of the stairs/
 She was standing on the lawn in front of her building)

Sentences featuring *zich* are also always interpreted with what we have called the object-centered perspective, just like *himself* in English.

- (86) a. De volwassenen op het schilderij kijken van ons weg, met
the adults on the painting look from us away with
 de kinderen achter zich.
the children behind REFL
- b. #De volwassenen op het schilderij kijken van ons weg, met
the adults on the painting look from us away with
 de kinderen achter hen.
the children behind them
 ‘The adults in the picture are facing away from us, with the
 children placed behind themselves/them’

The sentence in (86a) with *zich* is unambiguous: the children must be located behind the adults from the adults point of view, i.e., they must be standing in the foreground of the picture. The sentence with the pronoun in (86b), by contrast, affords the additional interpretation in which the children are standing behind the adults from the point of view of the observer viewing the picture, and therefore in the pictures background.

With respect to both the concrete nature of the location as well as the perspective adopted, Dutch *zich* behaves exactly like English *himself*. In the context of the analysis adopted here, this means that *zich* is lexically specified with intrinsic AxParts which can enter an Agree relation with the AxPart projection of the PP. Recall that for English *himself*, we had attributed these AxParts to the *-self* morpheme. We therefore conclude that English *self* and Dutch *zich* are elements lexically specified as possessing AxParts.

However, this cannot be the whole picture. Dutch *zich* also behaves like English *him* in certain PP-contexts. The sentences in (87) to (89), with *zich*, are just as bad as the corresponding sentences with *him* in English (cf. (79) above).

- (87) a. *De aarde draait rond/om zich.
the earth turns around/round REFL
 ‘The earth turns around itself’
 b. De aarde draait om haar as.
the earth turns round her axis
 ‘The earth turns around its axis’
- (88) a. *De toren viel op zich.
the tower fell on REFL
 ‘The tower fell in on itself’
 b. De toren implodeerde/viel op haar eigen fundamente.
the tower imploded/fell on her own foundations
 ‘The tower imploded/fell on its own foundations’
- (89) a. *Marie trok zich in zich terug.
Marie pulled REFL in REFL back
 ‘Marie withdrew into herself.’
 b. *Piet viel over zich.
Piet fell over REFL
 ‘Piet fell over himself.’

If Dutch *zich* were the exact counterpart of *himself*, we would expect its AxPart features to accommodate the relevant interpretation which we described for English in the previous section.

In the analysis proposed here, all uses of *zich* involve an Agreement relation between the prepositional AxPart projection and the AxPart features of *zich*. Nevertheless, the cases in (87)-(89) differ from those in (83)-(86) in one important respect. In contrast to the sentences in (83)-(86), those in (87)-(89) require dissociation between two parts of the antecedent for the event to take place. As we have noted before, in the English counterpart of (87), the interpretation is that parts of the earth revolve around its axis. A similar analysis applies to the other cases. All of these sentences therefore require a partial dissociation between the antecedent and a subpart of it. In (87a), this subpart may coincide with an Axial part, i.e., the vertical axis, but this is not necessary. In (88a), for example the building falls in along its vertical axis onto its ground floor. The sentences in (83)-(86), by contrast, do not require such dissociation into two parts. When John sees a snake near himself, John’s body is considered as a whole, and the single, undivided vantage point for the event of John’s perception of the snake.

We propose that the ungrammaticality of the relevant cases involving *zich* in (87)-(89) can be related to the inability of *zich* to accommodate dissociation or proxy readings as in (90), which were discussed in Rooryck and Vanden Wyngaerd (1998), Voskuil and Wehrmann (1990a;b).

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- (90) a. Op het gemaskerd bal konden Sally en Freddy
at the masked dance could Sally and Freddy
 zichzelf/*zich zien zonder spiegel.
 REFL.self/REFL see without mirror
 ‘At the masquerade, Sally and Freddy could see themselves
 without a mirror’
- b. Dorian Gray zag zichzelf/*zich op het schilderij zoals hij
Dorian Gray saw REFL.self/REFL on the painting as he
 werkelijk was.
really was
 ‘Dorian Gray saw himself on the picture as he really was.’

We have related the inability of *zich* to accommodate dissociation readings to the fact that *zich* represents a single time-slice that needs to be identified with one of the time-slices of the antecedent. We now propose that there is no difference between dissociation case in (90), and the ones in (87)-(89). In other words, the semantic nature of *zich* as a single time-slice excludes its presence both in (90) and in (87)-(89).

There is another case where the expected match between *zich* and *himself* breaks down. In those cases where the location described by the preposition is more metaphorical than physical, including expressions such as *put the episode behind X*, English does not allow *himself*, while Dutch permits *zich*:

- (91) a. Jan had die vervelende episode al lang achter
Jan had that bothersome episode already long behind
 zich/#hem gelaten.
 REFL/him left
 ‘Jan had put that bothersome episode behind him a long time ago’
- b. John had put that episode behind him(*self).

The contrast in (91) shows that English does not allow for an Agree relation between AxPart and the AxPart features of *himself* in these contexts, while Dutch *zich*, the supposed counterpart of *himself* in terms of AxPart features, at first sight does appear to license such a relation. Once again, the reason for this difference between English and Dutch has to do with the fact that *zich* represents a single time-slice. This temporal interpretation of *zich* can easily accommodate the temporal interpretation of *achter* ‘behind’ in (91).

A final question that arises is how Dutch complex reflexives such as *zichzelf* (cf. (92)) fit into the picture:

- (92) Jan zag een slang naast zichzelf/zich ZELF.
Jan saw a snake near REFL.self/REFL SELF
 ‘John saw a snake near himself’

The stressed variant of *zichzelf* in (92) requires a contrastive reading that is on a par with (93), where *zelf* exercises its function of Focus-marker:

- (93) Jan zag een slang naast Marie ZELF.
Jan saw a snake near Marie SELF
 ‘John saw a snake near Marie herself.’

The nonstressed variant of *zichzelf* in (92) is best interpreted in the context of a dissociation reading, where John sees the snake beside himself when looking at a picture, a video or a mirror. Another dissociation context with *zichzelf* is one where the reflexive is bound by the direct object, a reading which is triggered when the subject is first person and as a result cannot bind the reflexive:

- (94) (In mijn droom) zag ik Robert naast zichzelf/*zich.
in my dream saw I Robert near REFL.self/REFL
 ‘In my dream, I saw Robert next to himself’

Dissociation readings are also possible with *zichzelf* in the examples of (89):

- (95) a. Marie trok zich in zichzelf terug.
Marie drew REFL in REFL.self back
 ‘Marie withdrew into herself’
 (Subject-Self dissociation; cf. Lakoff 1996)
- b. Piet viel over zichzelf.
Piet fell over REFL.self
 ‘Piet fell over himself’
 (OK with *zichzelf* a statue)

The observation that sentences with nonstressed complex reflexives are most natural with proxy-readings can be corroborated by the fact that contexts that disfavor a dissociation reading yields unacceptable sentences. In (96a), it is hard to construe a reading where Marie holds the doll against a representation of herself. (96b) is only felicitous if Jan hides the book behind a statue or a picture of himself.

- (96) a. *Marie hield haar pop tegen zichzelf aan
Marie held her doll against REFL.self to
 ‘Marie held the doll close to herself’
- b. *?Jan verstopte het boek achter zichzelf
Jan hid the book behind REFL.self
 ‘Jan hid the book behind himself’
 (OK if *zichzelf* = Jan’s statue/picture)

The discussion of these cases in Dutch shows that the specific semantic and morphological properties of Dutch anaphors can explain their particular distribution in *snake*-sentences.

4. Small clauses with *have*

4.1. Possessive *have*

Sentences involving *have* and a spatial PP, such as (97) and (98), show a number of similarities with *snake*-sentences, the most obvious being the presence of an NP following the verb and a spatial PP.⁹

- (97) a. John had dirt on him/himself.
 b. The two-year old had chocolate all over her/herself.
- (98) a. Mary has \$5 on her/herself.
 b. The gun has dirt on it/*itself.

At the same time, there are also a number of differences, one being that *snake*-sentences do not express possession, whereas the sentences in (97) and (98) do. Before discussing additional differences between possessive *have*-constructions and regular *snake*-sentences, we shall discuss the analysis of possessive *have* given by Déchaine et al. (1995). They observe two remarkable properties of this construction with possessive *have*: one involves an animacy contrast, the other a contrast in the nature of the possessive relationship: contingent as in (99) or inherent as in (100). In cases with contingent possession, the possessor must be animate.

- (99) a. Mary has \$5.
 b. *The table has a lamp.

This contrast disappears in cases involving inherent possession, such as those in (100):

- (100) a. Mary has a big nose.
 b. The table has four legs.

The animacy contrast also disappears if a spatial PP containing a pronoun bound by the subject is added to the examples in (99). The nature of the possessive relationship does not change this time: both sentences of (101) express contingent possession.

- (101) a. Mary has \$5 on her.
 b. The table has a lamp on it.

Following Déchaine et al. (1995), we analyze the sentences with a spatial PP as involving a small clause, with a structure as in (102):

- (102) DP₁ *have* [_{SC} DP₂ PP]

⁹Compare the sentence (97b) to the dynamic (i), where only the *self*-form is possible:

- (i) The two-year-old rubbed chocolate all over herself/*her.

A notable peculiarity of the sentences in (101) is that the small clause must contain a pronoun bound by the subject of *have*. Déchaine et al. (1995) propose to account for this fact as follows. They assume that *have* is morphologically complex, consisting of an (incorporated) abstract preposition and a form of BE, i.e., HAVE=P+BE. This preposition gives to *have* its Case-licensing potential. The BE-component of *have* is furthermore assumed to be partitive operator: it is itself bound by the subject, but must at the same time bind a variable in its scope. The latter can happen under two circumstances:

- (i) inherent/inalienable possession: the complement of *have* is a relational noun.
Relational nouns (e.g., *nose*) contain an empty argument position that must be bound by a possessor.¹⁰ This is shown in (103a) below.
- (ii) contingent possession: the complement of *have* is a small clause containing a bound pronoun. This is the case in (103b).

- (103) a. John_i HAVE_i [DP big nose vbl_i]
b. The table_i HAVE_i [SC a lamp on it_i]

We shall by and large adopt this general approach here, although our proposal differs from it in a number of details. The difference between inherent and contingent possession correlates with another well-known distinction, that between stage and individual level predication: contingent possession is possession that is limited to a spatiotemporal stage of the possessor, whereas inherent possession is rather more timeless, i.e., possession at the level of the individual. In both of its uses, possessive *have* is stative, however. This kind of situation is also found with adjectival predicates: they are all stative, but reveal a lexical contrast between individual-level (e.g., *intelligent*, *tall*) and stage-level (*drunk*, *stoned*). It is reasonable to assume, as does Milsark (1977), that adjectives lexically divide into two subcategories, the states and the properties. The stage and individual level uses of possessive *have* cannot be analyzed quite in those terms, however, in that we cannot simply divide the predicates that occur in them into two distinct categories. It would seem that the kind of interpretation we get derives, at least in part, from the syntactic construction that it appears in. Let

¹⁰A similar assumption is made by Vergnaud and Zubizarreta (1992:596), who assume that an inalienably possessed noun takes a possessor argument. As Déchaine et al. observe, what counts as a relational noun is to some extent dependent upon context. In a sentence like *This hotel room has hot water*, the NP *hot water* functions as a relational noun, but clearly not in *We rinsed the potatoes in hot water*. Similarly, the noun *child* may be relational, as in (ia), but it can also be nonrelational, as in (ib):

- (i) a. Sandy has a child.
b. Sandy has a child on her lap.

us therefore take another look at Déchaine et al.'s (1995) analysis, but with an eye on accounting for the stage-individual level distinction. Assume, as seems reasonable, that contingent possession, or stage-level predication, requires the existence of stages. These stages may be either temporal or spatial. Temporal slices can be provided by an animate subject, spatial stages by a spatial PP. This leads to the conclusion that contingent possession requires either an animate subject, or a spatial small clause.¹¹ This is in fact the pattern that the data that (99)-(101) reveal.

Note that inanimate NPs are assumed not to possess temporal stages or time-slices: this was argued to be the case on independent grounds by Rooryck and Vanden Wyngaerd (1998). This will account for the contrast in (99): the animate subject in (99a) has time-slices, and the predicate *has \$5* can therefore be predicated of a spatiotemporally bounded slice of the subject, giving rise to an interpretation of contingent possession. Here, we differ from Déchaine et al. (1995), who assume that there is an empty pronominal small clause predicate in a case like (99a), bound by the subject. In contrast, the inanimate subject in (99b) lacks time-slices, and therefore cannot express contingent possession. Inherent possession (as in (100), repeated here) can be expressed in the absence of time-slices, because in such a case the predicate is true of the individual as a whole, not of a spatiotemporal slice of the subject.

- (104) a. Mary has a big nose.
 b. The table has four legs.

Déchaine et al. (1995) assume that there is also a formal difference between (99a) and (100a): relational nouns (such as *nose* and *legs*) contain an empty argument position that must be bound by a possessor (see (103a) above). While we do not believe that this assumption is a necessary one for these cases of individual level predication, it does not appear to be incompatible with our analysis either.

In a case of contingent possession like (99b), the addition of a spatial small clause makes the example acceptable (see (101b) above). On the

¹¹A stative construction with *be* can also express stage-level or contingent relationships:

- (i) There is a lamp on the table.

These also contain a spatial small clause. Some languages only permit the BE-variant, and do not have the analogue of possessive *have* with inanimate subjects, e.g., Dutch:

- (ii) *De tafel heeft een lamp erop/op zich.
 The table has a lamp thereon/on ZICH

Instead the existential construction in (iii) must be used, or even better still, one with a positional verb:

- (iii) Er ??is/staat een lamp op de tafel.
 There is/stands a lamp on the table.

present account, the spatial PP is necessary to introduce (spatial) stages, which are absent from inanimate subjects. It seems true independently that spatial PPs are always interpreted as stage-level predicates (as opposed to NPs and APs, for example). Furthermore, spatial PPs can express contingent relationships outside of *have*, as in the absolutive *with*-construction in (105):

- (105) [PP With [SC \$5 on the table]], we didn't have to worry about the tip.

So far, we have not introduced any new data and restricted ourselves to discussing those of Déchaine et al. (1995). In the following sections, we discuss three sets of data where possessive *have*-constructions deviate from regular *snake*-sentences. The first concerns unexpected quantifier binding properties; these will be discussed in §4.2 below. Second, instead of the pronoun, a *self*-form is sometimes possible in possessive *have*-constructions, as (97) shows. This fact remains unexplained by the analysis proposed by Déchaine et al. (1995). Moreover, when we take a closer look at the distribution of pronouns and *self*-forms we find contrasts like the ones just discussed: these are animacy contrasts, and contrasts involving the nature of the possessive relationship (i.e., inherent or contingent). Such contrasts will be discussed and accounted for in §§4.3 and 4.4, respectively.

4.2. Unexpected quantifier binding

In (2) and (8) above, repeated here, it was observed that the pronoun cannot be bound as a variable by a quantified subject. Rather, the pronoun behaves in the manner of cross-sentential anaphors.

- (106) Everyone/Nobody saw a snake near them/*him.
 (107) a. None of our friends saw a snake near *him/them.
 b. Nobody always sees snakes near *him/*them.

Surprisingly, small clauses with *have* do not exhibit the same quantifier-pronoun binding properties as those in (106) and (107). In *snake*-sentences featuring a small clause with *have*, as in (108)-(109), the pronouns behave as regular bound variables.¹²

¹²As noted by Rullmann (2003), in colloquial registers of English, singular quantifiers can bind plural pronouns:

- (i) a. %Someone left their coat on the table.
 b. %Every student thinks they're smart.

This is impossible with inanimate quantifiers, however:

- (ii) a. Every paper stated that it/*they discussed work in progress.
 b. I gave every argument its/*their due.

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- (108) a. Everyone/Nobody had dirt on him/?them.
 b. After the food fight, everyone had chocolate all over him/?them.
- (109) a. Everyone had \$5 on him/?them.
 b. Every gun had blood on it/*them.

Curiously, this behavior seems to be restricted to the verb *have*. The minimally different verb *hold* patterns with regular *snake*-sentences in that the cross-sentential-like behavior familiar from (106) and (107) reasserts itself, giving rise to minimal pairs such as the following:

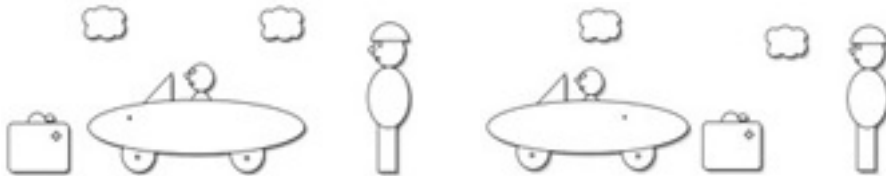
- (110) a. Everyone held a blanket around *him/they.
 b. Everyone had a blanket around him/?them

This observation obviously prevents us from extending the analysis proposed earlier to sentences involving small clauses with *have*.

In order to account for this unexpected pattern, we need to turn to another difference between sentences with possessive *have* and regular *snake*-sentences. This difference concerns the unavailability of observer-centered interpretations in the former. Consider again the sentence in (16), repeated here:

- (111) The suitcase is standing behind the car.

- | | |
|---|---|
| A. Observer-centered frame
<i>Perspective of the person standing:</i>
invisible side of car | B. Object-centered frame
<i>Car perspective:</i>
rear side of car |
|---|---|



As was noted above, the sentence *The suitcase is standing behind the car* is ambiguous: the perspective of the person standing (i.e., the observer-speaker), and the perspective of the car correspond to different realities.

Consider now the small clauses introduced by *with* and by *have* in (112). In both cases, the only perspective available is that of the car.

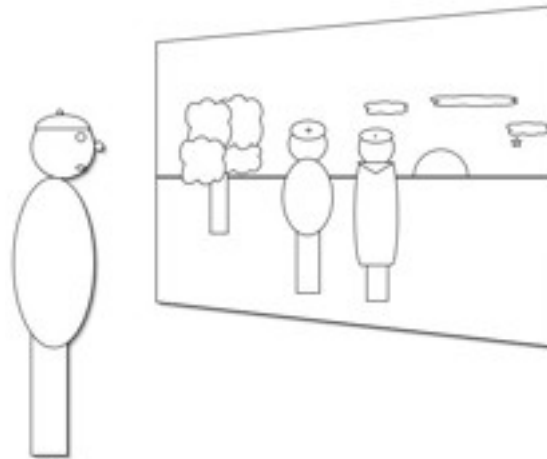
- (112) a. With a suitcase behind it, the car couldn't move. [only object-centered]
 b. The car has a suitcase behind it. [only object-centered]

The perspective of the person standing in the picture in (111), who coincides with the observer-speaker, is unavailable in these cases. Similar observations can be made for the picture cases discussed earlier, which

revealed a clear difference between the observer and the object-centered interpretations. Such a situation was discussed in (68)-(69) above, repeated here:

(113) The adults in the picture are facing east, with the rising sun behind them/*themselves.

(114)

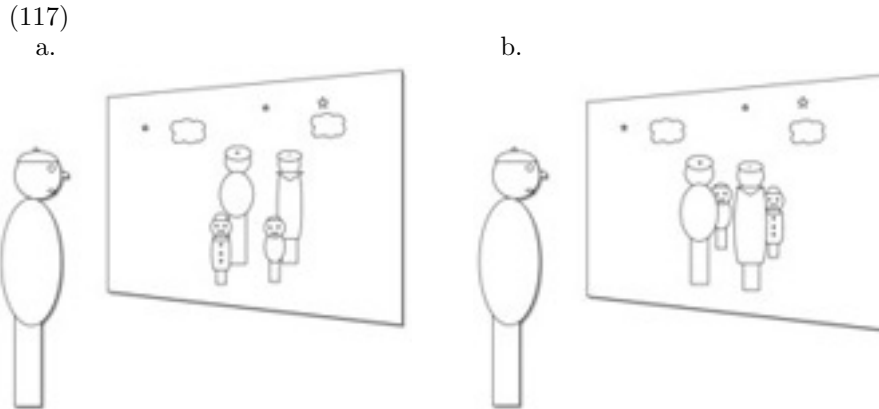


In contrast, it seems that the sentences in (115), with a SC containing a subject-bound pronoun, cannot describe the situation of (114).

- (115) a. With the rising sun behind them, the adults appear like silhouettes in the picture.
b. The adults have the rising sun behind them.

In this respect, they are similar to those in (112). A further case is that of (65), repeated here as (116), which we showed could describe the two situations in (117):

(116) The adults in the picture are facing away from us, with the children placed behind them



Here as well, however, only the object-centered (117a) situation can be described by a sentence with *have* followed by a SC containing a subject-bound pronoun:

(118) The adults have the children behind them.

In the terms of the analysis proposed here, this means that the AxPart variable cannot be bound by the Speaker. But the alternative analysis, according to which there exists an Agree relation between AxPart and the pronoun, is unavailable as well, as we have assumed that pronouns lack AxParts, and all of (112), (115) and (118) contain a pronoun. The only possible candidate for providing an object-centered interpretation is the main clause subject. As a result, the representation of (112b) is as in (119), with the AxPart variable bound by the subject instead of by the Speaker.

(119) $[\text{Evid } \mathbf{Sp}_{1P.SG} \text{ The car}_{\{front-back\}} \text{ had } [\text{SC a suitcase } [\text{Place } \emptyset [\text{AxPart behind}_{\{front-back\}} [\text{K } [\text{D it}]]]]]]]$

This, then, represents a third possibility: AxPart is not bound by the Speaker, and does not undergo an Agree relation with the complement of the preposition either, but it is bound by the subject. This analysis yields the correct results for quantifier binding: since the AxPart variable is bound by the subject, and not by the Speaker, there is no second occurrence of Speaker. As a result, quantifier binding can obtain freely, as illustrated in (120).

(120) $[\text{Evid } \mathbf{Sp}_{1P.SG} \text{ Everyone}_{\{top-bottom\}/i} \text{ had } [\text{SC dirt } [\text{Place } \emptyset [\text{AxPart on}_{\{top-bottom\}} [\text{K } [\text{D him}_i]]]]]]]$

As to the question *why* the AxPart variable in sentences with *have* is bound by the subject rather than by the Speaker, we propose the following. The syntax of (contingent) possession with *have* requires the existence of a bind-

ing relationship between the subject of *have* and a SC-contained pronoun (see the discussion in §4.1 above). It does not seem too far-fetched to assume that the obligatory Agree relationship between the axial dimensions of the subject and AxPart of the spatial PP as in (103), (119), and (120) is parasitic on the obligatory binding of the pronoun contained in the spatial PP by the subject. In fact, we can go one step further and assume that binding of the AxPart itself is what satisfies the requirement that *have* bind a variable in its scope. Being bound by the subject, AxPart is unavailable to binding by the Speaker, thus making the observer-centered perspective impossible.

4.3. Animacy effects

Let us now turn to a further discussion of animacy effects. These are of a different type from the ones discussed by Déchaine et al. (1995). Recall from (99) and (101) above that in cases of contingent possession inanimate possessors require the addition of a spatial PP containing a pronoun bound by the subject. These facts are summarized in (121):

- (121) a. Mary has \$5 (on her).
b. The table has a lamp *(on it).

The animacy contrast, which disappears when a spatial PP containing a pronoun is added, resurfaces when the pronouns is replaced by a *self*-form:

- (122) a. Mary has \$5 on her/herself.
b. The table has a lamp on it/*itself.

Similarly, Cantrall (1974) notes that (123a) and (124a), with an animate subject, allow for both pronoun and *self*-form, whereas (123b) and (124b), with an inanimate subject, only permit the pronoun. Other examples illustrating the impossibility of *self*-forms with inanimate subjects are given in (125).

- (123) a. Mary has dirt on her/ herself.
b. The gun has dirt on it/*itself. (Cantrall 1974:158)
- (124) a. The hunter/stag had a clear path in front of himself/him.
b. The fire had a clear path in front of *itself/it. (Cantrall 1974:48)
- (125) a. The sacred oak tree had a fence around it/*itself.
b. The house has aluminum siding around it/*itself.
c. A penthouse has all the other apartments in a building below it/*itself.

The analysis by Déchaine et al. (1995) has nothing to say about this pattern of data: following their proposal, a subject-bound pronoun is necessary in (121), but there appears to be no reason why a *self*-form could not satisfy

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the relevant requirement equally well. Yet this is only possible in (122a), and not when the subject is inanimate, as in (122b).

Under our analysis, *have*-sentences involve binding of AxPart by the subject, as indicated in (126).

- (126) [IP Mary_{top-bottom} has dirt [Place on [AxPart \emptyset _{top-bottom} [Kase \emptyset [D her]]]]]]

With the *self*-form, on the other hand, the representations would be as in (127), with an Agree-relationship between AxPart and the axial dimensions of the *self*-form:

- (127) a. [IP Mary has dirt [Place on [AxPart \emptyset _{front-back} [Kase \emptyset [D herself_{front-back}]]]]]]
 b. *[IP The gun has dirt [Place on [AxPart \emptyset _{front-back} [Kase \emptyset [D itself_{front-back}]]]]]]

Nothing in these representations would at first sight lead us to expect there to be the animacy contrast that we find. Before going on to discuss the contrast between (127a) and (127b), we want to focus briefly on another contrast, that between (126) and (127a). Some evidence exists to suggest that these two distinct representations must be assumed to exist, in so far as we can observe some of the contrasts that we observed earlier here as well. These do not have to do with perspective, for reasons that we discussed in the previous section (i.e., the impossibility for the Speaker to bind the AxPart variable), but they do exist for the kind of location that the spatial PP refers to. In (128a), the sentence with the pronoun affords both an interpretation in which the person sliding down the banister either has a cushion under his body (close proximity) or a cushion at the bottom of the stairs (looser proximity). This latter interpretation is excluded with the *self*-form, which requires the close proximity interpretation, as shown by (128b).

- (128) When you slide down the staircase banister,
 a. make sure you have a cushion under you.
 (cushion between your body and the banister, or at the bottom of the stairs)
 b. make sure you have a cushion under yourself.
 (*only* cushion between your body and the banister)

These examples suggest that the prepositional contexts in small clauses with *have* are not different from the ones that we have discussed for other *snake*-sentences in the preceding sections, at least as far as the nature of the location is concerned. In these cases as well, it seems that an Agree relation between AxPart and the spatial dimensions or features provided by the *self*-form triggers the ‘close proximity’ reading, whereas binding of AxPart from outside allows for a more abstract locative interpretation.

Returning to (127), the impossibility of (127b) is fairly easy to account for: recall that contingent possession requires the existence of a binding relationship between the subject of *have* and a pronoun contained in a small clause in the complement of *have*.

(129) The gun_{*i*} HAVE_{*i*} [SC dirt on it_{*i*}]

Assume, however, as was suggested earlier, that it is really AxPart that functions as a bound variable, and thus satisfies the requirements of possessive *have*:

(130) The gun_{*top-bottom*} has [SC dirt [Place on [AxPart \emptyset _{*top-bottom*} [Kase \emptyset [D it]]]]]

This gives us the right results. Let us see what happens when the pronoun in the above representation is replaced by a *self*-form, as in (127b). The *self*-form possesses axial features and will therefore enter into an Agree relation with AxPart, thus effectively blocking AxPart from being bound by the subject.

(131) *The gun has [SC dirt [Place on [AxPart \emptyset _{*top-bottom*} [Kase \emptyset [D itself_{*top-bottom*}]]]]]

As a result, the binding requirement imposed by the syntax of possessive *have* cannot be met. With an animate subject, *self*-forms are fine (cf. (127a)). This is because animate subjects contain time-slices, which allow the expression of contingent (or stage-level) possession in that way, as explained for (99a) in §4.1 above. That is, with animate subjects there is no requirement that the subject bind a SC-contained pronoun (or AxPart), witness (99a). Therefore, a *self*-form may Agree with AxPart and thus render AxPart inaccessible to outside binding.

4.4. Inherent vs contingent possession

In the previous section we found that contingent possession can only be expressed with inanimate subjects in the presence of a spatial small clause containing a pronoun, not a *self*-form. Actually, it turns out to be possible to find cases with inanimate subjects and with a *self*-form inside the small clause, but such cases express inherent rather than contingent possession. Consider the examples in (132):

- (132) a. A tree has a protective layer around it/itself, which is called the bark.
 b. Some fruits have their seeds inside them/themselves.
 c. Halley’s comet has a gaseous halo around it/itself.
 d. The Hardanger fjord has such a blue sheen over itself.

The relevant factor that distinguishes inanimate subjects triggering the *self*-form as in (132) from the inanimate subjects disallowing the *self*-form in (123b), (124b), and (125) seems to reside in the fact that the have sentences featuring the *self*-form in the small clause involve cases of inherent possession, whereas the sentences disallowing the *self*-form feature cases of contingent possession. In (123b), the dirt on the gun is a contingent property, as is the clear path for the fire in (124b). Similarly in (125), the fence around the tree, the aluminum siding around the house, and the apartments under the penthouse are contingently possessed by their possessors. By contrast, the protective layer of a tree in (132) is plausibly an inherent property of the tree, i.e., a case of inherent possession; similarly for the possessive relationship between the fruit and the seeds in (132b), the halo around Halley's comet in (132c) and the blue sheen over the fjord in (132d).

It is even possible to create minimal pairs underscoring this difference. In (133), the property of having a gaseous halo is an inherent property of Halley's comet, while having a spacecraft around it is a contingent property. Similarly in (134), having seeds constitutes an inherent property of fruits, while insecticide residues are not. In (135), having bark is an inherent property of trees, while protective netting is contingent.

- (133) a. Halley's comet has a gaseous halo around it/itself.
 b. In 1986, Halley's comet had a spacecraft around it/*itself.
- (134) a. Some fruits have their seeds inside them/themselves.
 b. Some fruits have insecticide residues inside them/*themselves.
- (135) a. A tree has a protective layer around it/itself, which is called the bark.
 b. The Christmas tree had protective netting around it/*itself.

The fact that a *self*-form is possible in cases involving SCs expressing inherent possession can now be easily accounted for.

- (136) a. *Halley's comet has [_{SC} a spacecraft [_{Place} a [_{AxPart} round_{dim} [_{Kase} ∅ [_D itself_{dim}]]]]]]
 b. Halley's comet has [_{SC} a gaseous halo [_{Place} a [_{AxPart} round_{dim} [_{Kase} ∅ [_D itself_{dim}]]]]]]

In both of these cases, AxPart does Agree with the *self*-form, but this only leads to ungrammaticality with contingent possession, in exactly the same way as in (131). With inherent possession, no ungrammaticality arises. This is because the relational noun in the small clause contains an empty position, allowing satisfaction of the binding requirement. This is confirmed by the following pair:

- (137) a. Halley's comet has a gaseous halo.
 b. Halley's comet has a gaseous halo around itself.

The fact that (137a) is good indicates that a SC-contained pronoun is not necessary to satisfy the binding requirement of possessive *have*. It then follows naturally that the *self*-form should be possible as well, even though it cannot satisfy said binding requirement. In a case with contingent possession, no relational noun is present, and a PP-contained pronoun is obligatorily present in the small clause. In such a case, the *self*-form is impossible:

- (138) a. *Halley's comet has a spacecraft.
b. *Halley's comet has a spacecraft around itself.

To round off this series, we present a final case, which features contingent possession and an animate subject. The animate subject satisfies the binding requirement of *have*, and a *self*-form is possible:

- (139) a. The four year old has chocolate.
b. The four year old has chocolate all over herself.

5. Other approaches

5.1. Structural differences of the PPs involved

Chomsky (1965; 1981) proposes to account for the absence of a Condition B effect in *snake*-sentences by assuming that the PP constitutes a binding domain; in Chomsky (1965:146) this is achieved by assuming the PP is really S:

- (140) Tony saw a snake [_S a snake is near him]

Not all spatial PPs are to be analyzed in this way, however. Some are not paraphrasable by a sentence, and therefore should not be analysed as S but as PP.

- (141) a. I aimed the gun [_{PP} at myself].
b. *I aimed the gun [_S the gun is at me].

As a result, the pronoun is impossible. Chomsky (1981:291) proposes something similar, arguing that the PP in a case like (140) has a subject of its own, as indicated in (142).

- (142) Tony saw a snake_j [PRO_j near him_i]

For Chomsky, there is no problem of noncomplementary distribution of anaphor and pronoun, since he assumes that there are really two constructions, which have a different structure, and each of the two construction features the expected complementary distribution of anaphor and pronoun.

Kiparsky (2002) adopts a strikingly similar analysis. He argues that there is a structural difference between PPs in *snake*-sentences. Argument PPs (e.g., (140)) require a reflexive, while PPs that are part of the predicate

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(e.g., (141)) will feature a pronoun. For Kiparsky (2002), a reflexive is possible if and only if a referential expression can be substituted for it, as in (143a). A pronominal is possible if and only if the PP can be predicated of the object, as in (143b) (Kiparsky 2002:95).

- (143) a. John aimed the gun at himself/*him. (Kiparsky 2002:96a)
 1.*The gun is at him now.
 2.Last time he aimed it at Fred.
 b. John brought the gun with him/*himself. (Kiparsky 2002:96b)
 1.The gun is with him now.
 2.*Last time he brought it with Fred.

A quite general problem with this type of approach is that, as we saw above, there exist many sentences which are completely identical, except for the difference between the anaphor and the pronoun. This includes notably the perspective evidence discussed by Cantrall (1974) and the location evidence adduced by Kuno (1987). One could try and save a Chomsky/Kiparsky-style analysis by assuming that in such cases as well, there exists a structural difference between the version with the anaphor and the one with the pronoun. The problem, however, is that Kiparsky's tests give the wrong results. This is shown for a perspective case in (9a) (from Cantrall 1974; repeated here as (144)), and a location case in (146) (inspired by Kuno 1987).

- (144) They placed their guns, as they looked at it, in front of themselves/*them.
 (145) a. The guns are in front of them now.
 b. Last time they placed them in front of the sheriff.
 (146) The two-year old rubbed chocolate all over herself/*her.
 (147) a. The chocolate is all over her now.
 b. Last time she rubbed it all over her brother.

Although the PP can be predicated of the object, as shown in (145a) and (147a), the pronoun is excluded and the *self*-form is fine. A converse case is the one in (148):

- (148) a. The mysterious dark alley drew Sherlock towards it(*self).
 b. *Sherlock is towards it.

Here the PP cannot be predicated of the object. Under Kiparsky's analysis, one would therefore expect to find the pattern of (143a) (*self*-form fine, pronoun impossible), but in fact the opposite pattern is found. It therefore seems that, even if one adopts a structural ambiguity approach, Kiparsky (2002) conditions do not properly predict the distribution of pronouns and *self*-forms in *snake*-sentences.

5.2. An asymmetry in Binding domains

The complementary distribution between anaphors and pronouns follows from the formulation of the Binding Theory, in particular conditions A and B, as well as the definition of a binding domain (‘governing category’ of Chomsky 1981). A possible avenue to account for the lack of complementarity between pronoun and *self*-form in *snake*-sentences is therefore to tinker with the formulation of either the binding conditions themselves, or with the definition of binding domains. Hestvik (1991) suggests a solution along those lines: he proposes that in a sentence such as (1), repeated below, the binding domain for the pronoun is the PP, while the domain for the *self*-form is the entire clause (IP).

(149) [IP Tony saw a snake [PP near him/himself]]

As a result, the pronoun can be bound outside its domain (PP) by the subject, while at the same time the *self*-form is bound inside its domain (IP) by that same subject.

As Büring (2005:54-55) notes, such an approach to *snake*-sentences means that there cannot be a single binding domain for both Condition A and B. Büring proposes that the domain for reflexives be stated in terms of the smallest category containing it, its case assigner and a Subject: in (1) this will be IP.¹³ The domain for the pronoun in (149) must be stated in terms of its co-argument domain: an NP’s co-argument domain is the smallest constituent X which contains (i) NP, (ii) NP’s case assigner C, (iii) NP’s Theta-role assigner T, and (iv) every XP whose case or theta-role is assigned by C or T (Büring 2005:56).¹⁴ This is the PP in (149).

Büring admits that this is an ‘ugly definition’. That is not the only problem, however. The definition predicts that the pronoun and the *self*-form are in free variation in *snake* sentences. We have shown above that this is not the case, and that there are many cases where either the pronoun or the *self*-form are favoured. We have also shown fairly extensively that systematic meaning differences arise between *self*-form and pronoun. These are wholly unexpected under the type of approach defended by Hestvik and Büring.

There is a further conceptual problem with approaches which try to capture the lack of complementarity between pronoun and *self*-form in *snake*-sentences in terms of the definition of Binding domain. The problem of a different definition of domain for Principles A and B is not that it is impossible to attain such a formulation, but rather that there is no fundamental reason why the definitions of these domains have the properties that they have. It is entirely unclear, for instance, why the domains for reflexive

¹³Note that for Büring there cannot be a PRO subject inside the PP, as in (142).

¹⁴The disjunctive formulation in (iv) in Büring’s definition of co-argument domain is required in the light of the behavior of *self*-forms as subjects of small clauses (see Büring 2005).

and pronoun proposed by Buring (2005) could not in principle be reversed. In other words, the definitions of these domains are at best descriptively adequate, but certainly not explanatorily satisfying.

5.3. Reinhart and Reuland (1993)

Reinhart and Reuland (1993:686ff) claim that in *snake*-sentences, Binding conditions only check the prepositional predicate P. Since P does not have a subject, it does not constitute a syntactic predicate, and as a result their formulation of Condition A (*a reflexive-marked predicate is reflexive*) is not met. They go on to claim that *self*-forms in snake-sentences really are logophors in view of (150b), where the *self*-form is bound by the superordinate subject:

- (150) a. Max saw a ghost next to him/himself
 b. Lucie said that Max saw a ghost next to herself (Reinhart and Reuland 1993:686)

In addition, Reinhart and Reuland (1993:686ff) claim that the use of anaphors in *snake*-sentences is “much more marked” than their use in nonlocative PPs like (151), a contention that is not further qualified:

- (151) Lucie explained Max to *her/herself (Reinhart and Reuland 1993:686)

There are a number of problems with this analysis. First of all, the notion that *self*-forms in snake-sentences are “more marked” is not borne out by the data. *Vide* (146), repeated here, where the anaphor is the only, and therefore by necessity the “unmarked,” option.

- (152) The two-year old rubbed chocolate all over herself/*her.

Our findings have shown that the *self*-forms simply have a different interpretation from pronouns. The meaning differences between *self*-form and pronoun in *snake*-sentences are systematic, and can be derived from a strictly configurational analysis. Under Reinhart and Reuland’s (1993) proposal, it is unclear how these systematic meaning differences would be derived.

Let us now turn our attention to the idea that *self*-forms in *snake*-sentences are logophors. While we believe that the sentence in (150) may involve a logophoric use of the *self*-form, this does not necessarily mean that all instances of *self*-forms in *snake*-sentences are logophors. There is in fact some evidence to suggest that they are not. In Dutch, logophors are morphologically different from anaphors. Dutch logophors involve the complex *self*-form *hemzelf* ‘himself,’ while the form *zichzelf* ‘himself’ is strictly limited to anaphoric contexts (Vanden Wyngaerd 1994). This is shown in the logophoric context provided by (153), where only *hemzelf* ‘himself,’ but not *zichzelf* ‘himself’ is licensed.

- (153) a. Max was zenuwachtig. De koningin had Marie en
Max was nervous. The queen had Marie and
 hemzelf/*zichzelf uitgenodigd.
himself/REFL.self invited
 ‘Max was nervous. The queen had invited Marie and himself’
 b. Max beschuldigde zichzelf/*hemzelf
Max accused REFL.self/himself
 ‘Max accused himself’

In English, such a morphological distinction between logophor and anaphor does not exist, and *himself* is therefore ambiguous between a logophoric and an anaphoric use.

Dutch *snake*-sentences, such as (154), show that both the logophor and the anaphor are possible:

- (154) Bij het plannen van het etentje had Max alvast Marie
with the planning of the dinner had Max already Marie
 naast zichzelf/hemzelf geplaatst.
next-to REFL.self/himself put.
 ‘While planning the dinner, Max had already put Marie next to himself’

In sum, the Dutch data show three different contexts: (153a) is one where only logophors can occur, (153b) hosts only anaphors, and *snake*-sentences (154) permit both. This strongly suggests that *snake*-sentences in English can also host anaphors, contra Reinhart and Reuland (1993).

6. Conclusion

In the analysis developed here, the domains for pronoun and *self*-form in *snake*-sentences are established dynamically in the configuration. Operator-binding of AxPart by the Speaker defines an opaque domain for Binding, so that only the pronoun is licensed. Because of the special nature of the intervening subject (i.e., the Speaker), there can be no quantifier binding of the pronoun. Under this approach, c-command is a necessary but not a sufficient condition on variable binding within a sentence. Furthermore, in such a case, the spatial PP is interpreted from an observer-centered perspective. Since the pronoun lacks spatial dimensions, the nature of the location is abstract.

In the absence of operator-binding by the Speaker, there must be an Agree relation between AxPart and a *self*-form inside the PP. The perspective is an object-centered one, and the nature of the location is concrete. Binding of the anaphor by both a quantified and a non-quantified subject is possible, as there is no intervening Speaker creating opacity.

Summing up, we submit that the apparent lack of complementarity between pronoun and *self*-form in *snake*-sentences is only apparent indeed.

In our analysis, there is the strongest possible complementarity between pronoun and *self*-form in these contexts, as regulated by the Janus-faced behavior of AxPart, which can either be bound from outside, licensing the pronoun, or entertain an Agree relation with its complement, the *self*-form.

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