

Reflexives and reflexivity

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Abstract (147 words)

This contribution provides an overview of the various means that languages use to represent anaphoric dependencies and reflexive predicates. These means are exemplified on the basis a broad variety of languages. The patters are prima facie complex, involving semi-reflexives, full reflexives, and affixal reflexives. Yet they can be accounted for on the basis of the morpho-syntactic properties of the elements involved, together with the way these interact with a number of universal principles and the syntactic environment. The central principles involved are a process of chain formation by Agree, a general property of reflexive predicates that requires them to be licensed, either by adding complexity for protection or by a lexical bundling operation, governed by an economy principle. Although we conclude, that there is no unified notion of what a reflexive is, yet, reflexives do have a shared core, namely their role in the licensing of reflexivity.

Main text (9989 words)

1. Background

The terms *reflexive* and *anaphor* are often – especially in the generative literature - used as virtually synonymous, for *expressions that lack the capacity for independent reference*, and therefore must depend on another expression for their interpretation. Whereas in the case of English *himself*, or Dutch *zichzelf* there is prima facie little reason to distinguish these terms, there are languages with a more complex inventory of elements for the expression of reflexivity that make a distinction useful.¹ I will start using the term *anaphor*, and use the term *reflexive* once it becomes relevant.

Anaphors belong to a broader class of expressions without lexical content, together with *pronominals* (such as English *I, you, he, she, it, we, and they*). These are nominal expressions characterized by their *phi-features*: *person* (mostly 1st, 2nd, 3rd), *class* (mostly *gender*: masculine, feminine, and neuter, but rather different classification systems exist as well), and *number* (mostly singular versus plural), but see Corbett (2000) and Harbour (2014) for detailed overviews and discussions.

Anaphors are often deficient in phi-features; notably they lack a specification for gender and number (e.g. Dutch *zich*, Norwegian *seg*), in some languages also for person (Russian *sebjá*, and reflexive clitics in other Slavic languages). However, one also finds more complex forms (such as English *himself*), that are dependent because of a property of their second component.

Anaphors and pronominals have a different distribution. The Canonical Binding Theory (CBT, Chomsky 1981) characterizes their distribution as in (1):

- (1) Binding Conditions CBT
(A) An anaphor is bound in its governing category
(B) A pronominal is free in its governing category

The governing category of an element is approximately the domain of its nearest subject (see Chomsky 1981, 1986 for details). The CBT expresses that anaphors are locally bound local, and entails strict complementarity between anaphors and pronominals. However, complementarity does not always obtain, as in (3):

- (3) *Max* put the book behind *him/himself*

Moreover, in many languages (including Dutch and Norwegian) one finds elements that in some sense appear to be anaphoric in the sense that they need a linguistic antecedent, but yet allow this antecedent to be much farther away, as in (4):

- (4) Norwegian:
Jon bad oss forsøke å få deg til å snakke pent om *seg/ham*
Jon asked us (to) try to get you to talk nicely about SE/him

¹ There is another use of the term 'anaphor' for any use of an expression that refers to a previously mentioned individual or object, but this is not the sense intended.

(Hellan 1988)

In fact, many more languages have expressions that are not obviously either pronominal or anaphoric. The following test has, therefore, been proposed to distinguish between anaphors and pronominals (Giorgi 1984, Dimitriadis 2000, Anagnostopoulou and Everaert 2013):

(5) Test: Pronominals allow split antecedents, whereas anaphors don't

The test is illustrated by the contrast in (6):

(6) Dutch
Alice zag [de hoedemaker het kopje tussen hen/ zich inzetten]*
Alice saw the Hatter the cup between them/SE put
'Alice saw the Hatter put the cup between them.'

On the basis of (5) *zich* qualifies as an anaphor. This leaves the question why *zich* and its cognates in Scandinavian can be non-locally bound. Discussion of non-local binding would lead us beyond the scope of the present contribution, though; see Reuland (2011a), and Reuland (2017) for a detailed account.

2 Introducing semi-reflexives

Many languages have elements that should qualify as pronominals on the basis of (5), but as anaphors given that they allow local binding. Elements with such a dual status are found in many Malayo-Polynesian and Uralic languages, but in certain contexts also English *himself* allows split antecedents. The pattern is illustrated on the basis of the Javanese examples in (7) (see Kartono 2013, Schadler 2014 for many more relevant examples and discussion).

(7) Javanese [Malayo-Polynesian]
a. John_i ndelok awak-e dee_{i,j}
John see body-3SG.GEN 3SG
'John saw himself.'
'John saw him.'
b. Tono_i ngabari Tini_j nek awak-e dee uwong_{i+j} lulus ujian.
Tono inform Tini that body- 3PL.GEN 3rd people pass exam
'Tono informs Tini that they passed the exam.'

Note, that Javanese is not an exception to condition B. It has a 3rd person pronominal *dee* that may not be locally bound. It also has an expression *awak-e dee dewe* 'body-3SG.GEN 3SG self' that must be locally bound, and does not allow split antecedents.

Many other Malay languages have an element with similar properties (Kartono 2013, Schadler 2014); also the Korean plural anaphor *caki-tul* and the Japanese plural anaphor *zibun-tachi* take split antecedents while being able to be locally bound (Schadler 2014: 64). As Schadler notes, also Malayalam [Dravidian] *taṅṅal-e tanne* (Acc, Plur) both allows local binding and split antecedents.

Volkova (2014, 2017) discusses the anaphoric systems of a number of Uralic languages. Meadow Mari, for example, has a pronominal *tudo*, which does

not allow local binding, and two anaphoric expressions *škenže* and *škenžəm ške* that both may be locally bound and hence prima facie look like anaphors. However, in contrast to *škenžəm ške*, which behaves as a classic anaphor obeying condition A of the CBT, *škenže* allows split antecedents, and also non-local antecedents, as in (8):

- (8) a. Kažne ajdeme_i šken-ž-əm_i (ške)/tud-əm*_{i/j} jörat-a.
every man self-p.3sg-acc self love-prs.3sg
'Every man likes himself.'
- b. Pet'a_i Jəvan-lan_j kartəčk-əšte šken-əšt-əm_{i+j} onč-əkt-en
Petja Ivan-dat photo-iness self-p.3pl-acc see-tr-prt
'Petja showed to Ivan them(selves) on the photo.'
- c. Üdər_i rveze_j de-č' [Ø_j ška-lan-že_{i/j} pört-əm əšt-aš] jöd-ən.
girl boy near-el PRO self-dat-p.3sg house-acc make-inf ask-prt
'The girl asked the boy to build her/himself a house.'

Komi-Zyrian, Besermyan Udmurt, and Shoksha Erzya show a similar pattern.

Consider, finally, English. Condition A requires an anaphor to be bound in its governing category. There is, however, a well-known class of exceptions to this. In coordinate structures, adjunct positions and in picture noun phrases *himself* is exempt from the local binding requirement (see a.o. Ross 1970, Zribi-Hertz 1989, Pollard and Sag 1992, and Reinhart and Reuland (1991, 1993). This is illustrated in (9).

- (9) a. Max expected [the queen to invite [Mary and *himself*] for a drink]
b. John_i was going to get even with Mary. That picture of himself_i in the paper would really annoy her, as would the other stunts he had planned (Pollard and Sag 1992).

In such positions *himself* also allows split antecedents, as in (10) in contrast to (11):

- (10) John_i asked Mary_j [PRO_j to hide those pictures of themselves_{i+j}]
(11) *John_i asked Mary_j [PRO_j to hide themselves_{i+j}]

These are not marginal facts. Every approach to anaphoric relations will have to accommodate the type of expression that on the one hand allows local binding, but on the other hand allows split antecedents in all or some positions.

The question is, then, how to understand the status of such elements. Cole et al. (2008) and subsequent work classifies elements like *awak-e dee* as *Binding Theory exempt anaphors*. However, this characterization does not tell us why they behave that way.

Expressions such as *škenže*, and *awak-e dee* in argument position can be coargument bound, but need not be. Since they also have the pronominal property of allowing split antecedents, Kartono (2013) and Volkova (2014, 2017) refer to them as *half-reflexives* or *semi-reflexives*, which is the term I will be using. I will employ the term *full reflexive* for elements like *škenžəm ške*, or *awak-e dee dewe* when needed to contrast the two types.

The term semi-reflexive is by itself not more explanatory than Cole et al's

term *BT exempt anaphor*. One of the goals of this overview is then to provide a more explanatory perspective.

My aim is complementary to that of Déchaine and Wiltschko (2017), who present an illuminating overview of reflexives based on their internal morphological composition. The present overview focuses on the relation between the 'internal' and 'external' grammar of reflexives.

3. Reflexive affixes

In many languages one finds affixes that prima facie play the role of a reflexive such as *himself* in English. For instance, in Russian one finds the affix *sja* (or *sj* – after vowels) besides *sebjja*.

Again, we find such affixes in a variety of other unrelated languages. In addition to semi- and full reflexives, Meadow Mari also employs verbal affixation to create a reflexive verb from a transitive one:

- (12) Meadow Mari [Uralic]
- a. Jəvan-ən ava-že küvar-əm mušk-ən.
Ivan-gen mother-p.3sg floor-acc wash-prt
Ivan's mother washed the floor.
 - b. Jəvan mušk-**əlt**-ən.
John wash-**aff**-prt
'John washed.'

We find the same in the other Uralic languages mentioned. (13) gives an example of their more distant relative Tegi Khanty. Tegi Khanty has one specific reflexivization strategy based on the suffix *-ij(t)*, and one based on a pronominal, to which we will turn later.

- (13) a. Łuv łuveł l'oxət-s-əłte.
he he.acc wash-pst-sg.3sg
'He washed himself'
- b. Łuv l'oxət-**ij**-s.
he wash-**aff**-pst.3sg
'He washed'.

But also Bahasa Indonesia [Malayo-Polynesian] , employs the affix-like *diri* in addition to the semi-reflexive *diri-nya* and the full reflexive *diri-nya sendiri*.

The use of 'reflexive' affixes is wide-spread cross-linguistically. In some languages the element is dedicated to the expression of reflexivity (Bahasa Indonesia *diri*), in others it has a broader distribution. Geniušiene (1987) presents an overview of the various roles of 'reflexive' affixes and clitics in Slavic, Baltic and other Indo-European languages, where one element may perform a role in rather different argument structure alternations (reflexive, passive, middle). Franssen (2010) provides an overview of Australian and Austronesian reflexives, based on existing grammatical descriptions. Often the detail in these descriptions is limited. But, nevertheless, they show a high prevalence of the use of reflexive affixes. In at least 21 languages (43.75%) of his sample of 48 languages reflexive verbs are derived from canonical transitives by means of a verbal affix.

How do affixal reflexives relate to reflexives expressed with an anaphoric argument? Are the affixes just reduced forms of an anaphor, or are there more substantive differences? As yet these questions have not been investigated for all the languages involved. But in those cases where such research has been carried out the results do in fact show a substantive difference. A related question is why these affixes often appear to perform various roles. (See section 6.4 for discussion.)

3.1 Testing for argument status

The argument status of reflexive affixes can be tested using a contrast first discussed in Jackendoff (1992). Jackendoff notes that *himself* in English does not always have a strictly reflexive interpretation. Grooming verbs in English allow two ways of expressing reflexivity, as in (14):

- (14) a. Ringo washed himself
 b. Ringo washed

Intuitively, (14b) is also reflexive, but there is no direct evidence for a separate object argument: *himself* in (14a) can be interpreted either as the person Ringo or as Ringo's wax statue. Crucially, however, in (14b) a statue interpretation is not available, as indicated in the proxy-test:

- (15) Proxy-test
 a. {Upon a visit to Mme Tussaud wax museum,} *Ringo washed himself*.
 (Theme: ^{OK}Ringo, ^{OK}Ringo's statue)
 b. {Upon a visit to Mme Tussaud wax museum,} *Ringo washed*.
 (Theme: ^{OK}Ringo, *Ringo's statue)

The simplest account is to say that there is no object projected in this case. However, even if one would argue for a null-object (which then would have a special and restricted distribution) it cannot be a standard pronominal, since it is a general property of pronominals that they do allow proxy-interpretations (see Safir 2004, Reuland and Winter 2009). Interestingly, the same contrast is found in Dutch between the reflexives *zichzelf* and *zich* (Reuland 2001, 2011a).

The availability of statue readings appears to be a regular feature of argumental reflexives, including clitics (Labelle 2008, Marelj and Reuland 2016). Languages for which these readings have been reported include Germanic, Romance and Slavic languages, but also Uralic languages such as Khanty (Volkova and Reuland 2014), Meadow Mari and the related languages discussed in Volkova (2014, 2017), Javanese (and other Malay languages) discussed by Kartono (2013) and Schadler (2014), Berber, and Yoruba, Gungbe and related languages discussed in Schadler (2014). (Section 6.1 shows how this reading arises.)

Another test for argument status involves object comparison (Zec 1985, Dimitriadis and Que 2009, Dimitriadis and Everaert 2014):

- (16) Object comparison test:
 a. Bill washes himself more often than John.
 b. Bill washes more often than John.

(16a) has two readings. One is that Bill washes Bill more often than John washes John (subject comparison); the other one is that Bill washes Bill more often than Bill washes John. In (16b), however, object comparison is impossible. It doesn't allow the reading that Bill washes Bill more often than Bill washes John. Since in (16a) object comparison is available the predicate must have an object argument to enter the comparison. Again, the simplest answer to the question of why object comparison is impossible in (16b) is that there is no object argument to start with.

In English the contrast is between *himself* and no marking. The other languages we discussed have an overt marker on the verb. Yet, in all of the languages where the test has been applied (Russian, Meadow Mari - and also the related Komi-Zyrian, Besermyan Udmurt, and Shoksha Erzya-, Khanty, Bahasa Indonesia, statue readings are not available, as in (17) (see also Bahasa Indonesia *diri*, Kartono 2013).

(17) Meadow Mari (Volkova 2014)

- a. {LC: Gorbachev came too see the wax figures. }
 Keneta (tudo) šken-ž-əm mušk-aš tüŋal-ən
 suddenly he self-p.3sg-acc wash-inf start-prt
 Suddenly he started washing himself/the figure.
- b. {LC: Gorbachev came too see the wax figures. }
 Keneta (tudo) mušk-əlt-aš tüŋal-ən.
 suddenly he wash-detr-inf start-prt
 Suddenly he started washing (himself/*the figure).

Whereas the various Australian languages with affixal reflexives in Franssen's overview probably do involve de-transitivization, one should keep in mind that it is not a foregone conclusion that this is always the case with affixal reflexives. For instance, object comparison is available in Chicheŵa, despite the infixal nature of the reflexive (Dimitriadis and Everaert 2014):

(18) Chicheŵa, Niger-Congo (Mchombo 2004: 106)

- Alenje á-ma-**dzi**-nyóz-á kupósá asodzi.
 hunters SM-Hab-Refl-despise-FV exceeding fishermen
 i. 'The hunters despise themselves more than the fishermen
 (despise themselves)'.
 ii. 'The hunters despise themselves more than (they despise)
 the fishermen'.

So, what we see here is an argument reflexive incorporated in the verb.

3.2 A restriction on affixal reflexives

Where data are available it appears that affixal reflexivization is restricted by properties of the argument structure of the predicate involved. One typically finds it with verbs that assign an agent role to their subject and a theme-role to their object (henceforth *agent-theme* verbs) (Reinhart 2016, Reinhart and Siloni 2005). This class includes grooming verbs (*wash, dress, etc.*), but also verbs like *defend, disarm, etc.* A class resistant to verbal reflexivization is that of the subject

experiencer verbs, such as *hate*, *admire*, *know*, where the subject has an experience of which the object is the source. We see this in languages as varied as Modern Greek (Papangeli 2004), Russian, Meadow Mari (and also the related Komi-Zyrian, Besermyan Udmurt, and Shoksha Erzya, see Volkova 2014), Khanty) (Volkova and Reuland 2014), Sakha (Vinokurova 2005), see (19) for Russian, and (20) for Sakha (a Turkic language spoken in the Sakha Republic of the Russian Federation).

- (19) a. Ivan pomylsja versus Ivan pomyl sebja
 Ivan washed_{REFL} Ivan washed himself
 b. *Ivan nenavidelsja versus Ivan nenavidel sebja.
 Ivan hated_{REFL} Ivan hated himself

Sakha uses an *-n* affix for reflexives and passives. However, again, this affix cannot be used for a reflexive interpretation of ‘subject experiencer’ predicates. In that case the full anaphor *beje-tin* must be used, as illustrated in (20):

- (20) a. Aisen tarba-**n**-na / möq-**ün**-ne / tard-**yn**-na.
 Aisen scratch-refl-past.3 / scold-refl-past.3 / pull-refl-past.3
 ‘Aisen scratched/scolded/pulled himself.’
 b. *Sardaana araldyt-**yn**-na/tapta-**n**-ar.
 Sardaana distract-refl-past.3/love-refl-aor
 ‘Sardaana distracted herself/loves herself.’
 c. Sardaana_i beje-tin_{i/*j} araldjyt-ta/tapt-yyr.
 Sardaana self-3.acc distract-past.3/love-aor
 ‘Sardaana distracted herself/loves herself.’ (Vinokurova 2005)

This restriction merits a systematic cross-linguistic investigation. Even so, the thematic limitations on these affixes and their various uses (reflexive, middle, passive) found so far, warrant an important conclusion:

- (21) There is a class of ‘Reflexive affixes’ that are not compositionally interpretable as reflexivizing operators on predicates.

The question is, then, how to understand this result. We will come back to it in section 6.4.

4 Approaching reflexives and reflexivity

Since the development of the CBT in Chomsky (1981), binding theory has been the subject of extensive discussion and further development. See for instance, Reinhart (1983), Koster (1985), Everaert (1986), Pica (1987), Hellan (1988), Zribi-Hertz (1989), Cole et al. (1990), Reinhart and Reuland (1991, 1993), Pollard and Sag (1992), Reuland (1995, 2001), Hornstein (2000), Reinhart (2006), Boeckx, Hornstein and Nunes (2007), Safir (2004), Hicks (2009), Kratzer (2009 and subsequent work), Rooryck and Vanden Wyngaerd (2011), or Safir (2014), Charnavel and Sportiche (2016) to mention a few. See also Koster and Reuland (1991), Lust et al. (2000), Cole et al. (2001), König and Gast (2008) for useful collections of articles.

Heine and Myashita (2008), and Moyses Faurie (2008, 2017) contain an insightful discussion of reflexivity in a number of less well studied languages, pointing out that overall these languages do appear to have some special means to represent reflexivity.

Reinhart (2002), (2016), Marelj (2004), Reinhart and Siloni (2005) develop an approach to verbal alternations, including the formation of reflexive predicates, based on operations on argument structure (the *Theta System*).

Another line of research is based on the idea that the verbal system contains one of more functional projections reflecting *voice* and involved in the expression of passive, middles, antipassives and their like, and also reflexivity, see, for instance, Labelle (2008), and, for a more general perspective, Legate (2014). Conceptually and empirically there are considerable differences between the latter two approaches. See the various contributions in Everaert, Marelj and Reuland (2016) for an assessment.

Space is lacking for a comprehensive discussion of the various approaches. For more specific discussion I refer to Reuland (2011a, 2016, and 2017), and Marelj and Reuland (2016). Moreover none of them addresses the full range of facts discussed in Reuland (2011a) and subsequent work. Hence, I will take that as my lead through the discussion.

As I intend to show, the patterns, though *prima facie* quite complex, can be accounted for by the interplay between three simple and general factors that are not specific to binding: i. a condition on reflexive predicates; ii. a condition on the syntactic formation of dependencies, and iii. an economy condition.

4.1 A Preliminary: Coreference and binding

Important is the distinction between *coreference* and *binding*. Different linguistic expressions may refer to the same object in some real or virtual world.

Pronominals share with proper names and expression with descriptive content the ability to pick out an individual from the domain of discourse, with coreference as an option. They may also enter into a different dependency relation, though. This is illustrated by the contrast in (22) (Heim 1982).

- (22) a. The soldier_i has a gun. Will he_i attack?
b. No soldier_i has a gun. *Will he_i attack?

(22a) illustrates coreference: the pronominal in the second sentence may pick out the same individual from the discourse as *the soldier*. As indicated by the coindexing, *the soldier* is the *antecedent* of *he*. In (22b) no such dependency can be established, since *no soldier* does not denote an individual *he* could pick up as a referent. Consequently, the coindexing in (22b) cannot be interpreted. There is another type of dependency, though, in which *no soldier* can serve as an antecedent of *he*:

- (23) No soldier_i thinks he_i will attack.

This dependency is *binding*. Binding is subject to the condition of *c-command* (Reinhart 1976, 1983 and subsequent work), as in (24), which is not satisfied in (22).

- (24) a. a c-commands b iff a is the sister of a constituent c containing b
 b. [a [c ... b...]

The contrast between binding and coreference is also illustrated in (25). In (25a) *the soldier* refers to an individual in the discourse, and can *he* pick out the same individual. The expression *every soldier* in (25b) does not refer to an individual. Hence, coreference is not available. Since *every soldier* is not a sister of the constituent containing *he* binding is not available either, hence no dependency can be established.

- (25) a. The girl who discovered the soldier_i thought he_i would attack.
 b. *The girl who discovered every soldier_i thought he_i would attack.

Thus, *locally coreferent* pronominals present a different type of issue than *locally bound* pronominals (Grodzinsky and Reinhart 1993).² Unfortunately, many descriptions of anaphoric systems limit their examples to definite antecedents, potentially leaving a significant loose end.

Especially in the case of languages that allow locally covalued pronominals it is important to apply the test in (26) before drawing conclusions about binding theory:

- (26) *Quantificational antecedent test*
 Quantificational antecedents require binding, hence differentiate between binding and coreference.

4.2 Defining binding

Binding theory (the theory of A(argument)-binding) describes the interpretive dependencies between phrases in *argument positions*, or *A-positions*, briefly *arguments*. A-positions are positions for phrases to which a predicate assigns a semantic role (*agent, patient, beneficiary, etc.*), or of which a predicate governs the case such as nominative, accusative, etc.

Chomsky (1981) presents the definition of binding in (27):

- (27) a binds b iff i. a and b are coindexed; ii. a c-commands b.

This definition assumes that indices have a theoretical status rather than being just a notational convenience. But, since Reinhart (1983) we know that syntactic indices are problematic, since they cannot receive a uniform interpretation. Chomsky (1995) took this further, concluding that they are not morphosyntactic objects (for instance, no language expresses indices or coindexing morphologically), hence don't have a place in syntactic derivations (they would violate the *inclusiveness condition*).³

² See Volkova and Reuland (2014)'s testing of locally bound pronominals in Khanty.

³ See Reuland (2011b) for an overview of the problems with indices in syntax. Note there is a different and technical use of the notion of an index in semantic interpretation (see Heim and Kratzer 1998), which is unaffected by these considerations.

Subsequently, Reinhart (2006) presented a linguistic definition of (semantic) binding – Argument binding, or *A-binding* in (28). It is based on the logical notion of binding, which is independently needed. Intuitively, binding involves filling an open position in an expression. If an expression has a number of open positions, they may end up being bound by the same element. Lambda calculus provides a system for managing such positions (see Heim and Kratzer 1998, Buring 2005, and Winter 2016 for details). So, in (28b) the lambda operator **binds** both occurrences of *x*, and since α is a sister of this λ -predicate, both occurrences of *x* end up being **A-bound** by α .

(28) *A-binding* (Reinhart 2006)

- a. α **A-binds** β , iff α is the sister of a λ -predicate whose operator **binds** β .
- b. $\alpha (\lambda x (P (x \dots x)))$

In order to apply this definition in cases like (23) where a descriptive expression like *no soldier* should end up A-binding the pronoun, the variable implicit in such expressions must be made visible for the grammar. This is achieved by the following procedure for relating syntactic derivations to logical syntax representations: Move the subject *no soldier* from its argument position, adjoining it higher up in the structure (by *quantifier raising* (QR) in the sense of May 1977), substitute a variable for its trace in the original position, and prefix λx to the minimal category containing the subject and the pronominal to be bound. If the variable translating *her* and the variable resulting from QR are chosen identically—which is just an option, but not enforced, since *her* may refer to someone else—both will be bound by the prefixed λ -operator and end up being A-bound – as defined – by the original argument in its adjoined position. Thus, we have the derivation in (29):

(29) No soldier thinks he will attack \rightarrow
 No soldier $[_{TP} t [_{VP} \text{thinks} [x \text{ will attack}]]]$ \rightarrow
 No soldier $[_{TP} \lambda x [_{TP} x [_{VP} \text{thinks} [x \text{ will attack}]]]]$.

This logical “machinery” is just what is needed to make the notion of linguistic binding precise.

4.3 An initial discussion of reflexivity

Prima facie, reflexivity can be seen as a limiting case of binding, namely binding of one argument of a predicate by another one, as in *Ringo washed himself*. The result can then in principle be represented as in (30) (but see section 6.1 for a modification):

(30) Ringo $(\lambda x (\text{washed } x, x))$

However, as we saw in section 3, verbs can have an interpretation that intuitively also should fit the bill for being reflexive, without an overt object (as in *Ringo washed*, (14b)). This necessitates a broader definition of reflexivity:

- (31) A predicate formed of a head P is reflexive iff one of its arguments bears two or more of P's thematic roles.

Whereas (14b) is not a case of coargument binding, *wash* does assign its theme role (together with its agent role) to its one argument *Ringo*. That the theme role is present can be tested with adverb modification (Dimitriadis and Everaert 2014):

- (32) Adverb modification test
Adverbs such as *completely* target the explicit theme/patient role.

Ringo washed completely has, indeed, the interpretation that Ringo washed his entire body. Applying the test in, for instance, Khanty, achieves the same result. Thus, (36) is a useful tool to assess the effect of affixal reflexivization.

One of the main issues in the understanding of reflexivity is why languages require some special marking to express it. Given that politicians all have a considerable degree of self-admiration, why is it impossible to simply express this as in (33), although in other environments *him* and *his* can be easily bound by *every politician*, as in (34) (even into an adjunct):

- (33) **Every politician admires him.*
(34) *Every politician stays in office after his voters stop admiring him*

Note, that we can no longer assume a condition B that prevents (33) (see section 4.2).

In fact, languages systematically avoid this simple way of expressing reflexivity ('Brute Force' reflexivization). One pervasive means is the use of *complex anaphors*, like for instance Georgian *tav tavis*, Basque *bere burua*, English *himself*, Dutch *zichzelf*. Complex anaphors consist of a pronominal or simplex anaphor (such as *zich*, henceforth SE-anaphor), and some additional element. These other elements may be of a quite varied origin. Some are historically intensifiers, and currently semantically virtually empty, such as English *self* in *himself*, Dutch *zelf* (*zichzelf*), Frisian *sels* (*himsels*), Norwegian *selv* (*seg selv*, *ham selv*), Icelandic *sjálfan* (*sjálfan sig*) (all, henceforth, SELF-anaphors). A great many languages use so-called bodypart reflexives. Such reflexives are based on an element that occurs independently as a nominal head designating a body part such as *head*, *bones*, but also designations such as *soul*, or *spirit* are found. Sometimes the lexical meaning is still transparent in some contexts, as in Georgian (Amiridze 2006), or Basque, where *bere burua* 'his head', is used to express a reflexive, but is also used literally in a sentence as *he put the cap on his head* (Hualde and Ortiz de Urbina 2003). Sometimes it is not, as in Hebrew. In Papiamentu the choice of the additional element is even sensitive to the verb meaning (Muysken 1993). Other languages, such as Malayalam (Dravidian, Jayaseelan 1997), Tsakhur (North Caucasian, Toldova 1999), Avar (North Caucasian, Rudnev 2017), Taiwanese (Sino-Tibetan, ATD), Meitei (Sino-Tibetan, ATD), and Lari (Iranian, ATD), use a doubled pronoun.

On the other hand, as discussed in the previous section, languages also employ a variety of verbal affixes.

The question is, why do languages use such a roundabout way to express reflexivity? Why cannot *him* in (33) simply be bound by *every politician*?

Why do languages use a dedicated reflexive form (semi-reflexive or full reflexive), or attach a special marker to the verb?

A related issue shows up in pronominal possessives. While languages such as English, Dutch, or German, and all current Romance languages allow a locally bound pronominal in possessive like *Jack* loves his *cat*, Scandinavian languages require a possessive anaphor (also *reflexive possessive*) such as Norwegian *sin*, Latin required the possessive anaphor *suus* and Russian requires the possessive anaphor *svoi*.

5 Differences in verb class and local binding of pronoun types.

To understand (33), compare Dutch and Frisian (35) and English (14), together with the result of replacing the equivalent of *wash* with *bewonderen/bewûnderje* 'admire' in (36).

- (35) a. *Ringo waste zich/*hem/zichzelf*
b. *Ringo waske him/himsels*

- (36) a. *Ringo bewonderde *zich/*hem/zichzelf*
b. *Ringo bewûndere *him/himsels*

In Dutch *wassen* 'wash' allows a SE-anaphor, but does not allow a pronominal, but *bewonderen* 'admire' requires a complex anaphor. In Frisian *waskje* is fine with a pronominal, but *bewûnderje* 'admire' requires a complex form. In a nutshell, Frisian allows a pronominal wherever Dutch allows the SE-anaphor *zich*. Importantly, these Frisian pronominals are real pronominals. *Ringo waske him* can as easily be interpreted as Ringo washing someone else.

Thus, explaining why the simple pronoun is ruled out in (33) requires separating two factors: a condition on local binding of pronominals (why English and Dutch are not like Frisian), and a condition on reflexive predicates (why *bewonderen/bewûnderje* are not like *wassen/waskje*).

5.1 Local binding of pronominals: the role of feature chains

While the number of languages allowing local binding of 3rd person pronominals is quite limited, local binding of 1st and 2nd person pronominals is pervasive, as shown by all Germanic and Romance languages, except for English.

The prevalence of local binding of 1st and 2nd person pronominals as compared to 3rd person pronominals is an important question. But even at the descriptive level it leads to an important guideline, as in (37):

- (37) Always assess the availability of local binding for all persons.

I start the overview with 3rd person pronominals.

5.1.1 3rd person pronominals

The pronominal *hem* may not be locally bound in Dutch, but its counterpart *him* in Frisian allows local binding. The difference cannot be a matter of semantics, since both are semantically variables, and variable binding by itself is not subject

to locality restrictions (as illustrated in (38), where a variable can be accessed by its binder even within an adjunct – the *after*-clause).

Within minimalist approaches to syntax (see Chomsky 1995, and subsequent work) the available operations to syntactically encode dependencies are just *Move* and *Agree*. *Move* can be used to encode a dependency, since a copy shares relevant properties with the element it is a copy of, as in (38):

(38) *This man* I never expected to see *t_{this man}* in the White House.

Hence, to the extent *Move* is involved in the encoding of binding, its locality conditions will be inherited.

Agree can be decomposed into *compare/check* and *identify/share values*. *Agree* effectively allows for the antecedent to over-write/fill cells in the dependent element with copies of its own features, thus identifying the two, as for instance in Subject Verb or Adjective Noun agreement in languages where this is overtly represented. Hence, also where *Agree* is sensitive to locality this will be inherited by the binding dependency it encodes.

In a nutshell, syntax has precisely one way of representing identity, namely by the *y is a copy of x*-relation, underlying both *Move* and *Agree*. The way in which *Agree* encodes binding dependencies is discussed in detail in Reuland (2011a), see also Reuland (2017), and technically implemented in Pesetsky and Torrego's (P&T, 2007) theory of feature chains. For current purposes an informal exposition suffices.

The dependencies involved are summarized in (39), where φ stands for a phi-feature bundle, and *u* stands for unvalued; the DP stands for the subject-argument, with a fully valued set of phi-features, T for the Tense node carrying the standard agreement, *v/V* for one or more mediating verbal heads, and SE, finally for a SE-anaphor such as *zich*, which is deficient for phi-features, and visible to chain formation by a structural accusative Case feature.

(39) [DP_{val φ} [T φ [... [v/V φ ... SE_{u φ +StrAcc} ...]]]]]⁴

The exchange of values in the formation of a feature chain unifies the features it contains. By valuation, feature values are copied/overwritten. Therefore, all the tokens of φ in (39) share instances of their features. Since copying/overwriting of feature values encodes identity, a syntactic pre-encoding of the binding relation results. Note, that chains are *single-headed*, which explains the *impossibility of split antecedents*.

A bound pronominal in the position of *zich* is ruled out by a general *condition on chain formation*. Overwriting is subject to a general *principle of recoverability of deletions* (PRD, Chomsky 1995). Informally, an occurrence of a feature cannot be overwritten by another occurrence of that feature if this limits interpretive options. A SE-anaphor and its antecedent only share interpretive constants (category, person) (see Reuland 2011a). But the pronominal *him* in

⁴ The availability of a derivation is neutral about the upward agree/downward agree debate. Although the representation in (43) reflects 'upward agree' (Zeijlstra 2012), which is easier for exposition, Reuland (2011a) gives a derivation based on the standard 'downward agree'.

let's say *Jack admired him* allows an interpretation as someone other than Jack. If *Jack* and *him* were to be become members of the same syntactic chain, those interpretations would be lost, in violation of the PRD.

This prohibition cannot be bypassed by semantic binding.

- (40) a. *Jack* voelde [*zich* wegglijden]
 Jack felt [SE slip away]
 b. **Jack* voelde [*hem* wegglijden]
 Jack felt [him slip away]
 c. Jack (λx . (x felt [x slip away]))

Deriving (40c) from (40b), instead of (40a), via chain formation is blocked as a violation of the PRD. As argued in Chomsky (1995), such a derivation is *cancelled* (cannot continue). Consequently, there cannot be a derivation bypassing the prohibition of chain formation by direct semantic binding (Reuland 2011a).

Note, that this prohibition does not involve a direct comparison between the *zich*- and the *hem*-options. The *hem*-option is just blocked in its own right, leaving the derivation from *zich*.⁵

A language may have locally bound pronominals in environments where the pronominal is *not visible* for chain formation (hence no derivation is cancelled). Thus, local binding of 3rd person pronominals, as such, is not problematic for the existence of universals in binding theory (contra Evans and Levinson 2009). But there has to be a grammatical factor that makes it possible. The task is to identify it.

To exemplify this, I will first discuss Frisian, then move to the Uralic language of Khanty, which also allows locally bound pronominals, and then briefly discuss the issue of reflexive possessives.

The reason Frisian allows local binding of pronominals resides in a minor parametric difference: Frisian allows licensing of object pronominals with *non-structural Case* (Hoekstra 1994). Consequently, there is a derivation in which *him* in (35b) corresponding to the position of SE in (39), is not visible as a target for entering the chain:

- (41) [DP_{val ϕ} [T ϕ [... [v/V ϕ ... | PRON<sub>val ϕ -StrAcc]]]]
 X</sub>

In (41) there is no violation of the PRD; hence the derivation is not cancelled. Therefore, semantic binding of *him* by *Jack* is not blocked.⁶

⁵ The text proposal is unlike other approaches based on economy, such as Reuland (2001), Boeckx, Hornstein and Nunes (2007), Safir (2004), or Rooryck and VandenWyngaerd (2011). All these proposals predict a strict complementarity between anaphors and bound pronominals that in fact does not obtain, as we saw. Note that in the present view there is no guarantee that a language will have developed a SE-anaphor in positions where a bound pronominal is blocked.

⁶ It has been suggested that Frisian allows for a simpler explanation, namely just the absence of a SE-anaphor as a competitor (Rooryck and VandenWyngaerd 2011). However, this cannot be the relevant factor. Frisian has a split in the

Note, that binding by chains and its restrictions is just a by-product of general principles of grammar, and language specific morpho-syntactic properties. This is illustrative of what we may expect cross-linguistically: Minor differences in morpho-syntax may have striking effects at the macro-level.

This is also illustrated by local binding of pronominals in Khanty (Nikolaeva 1995,1999, Volkova and Reuland 2014). Khanty has obligatory agreement between the finite verb and the subject, and *optional agreement with the direct object*. There is no dedicated anaphor in Khanty, but it allows local binding of a pronominal in object position. Crucially, however, local binding requires the presence of object agreement. As shown in Volkova and Reuland (2014) object agreement checks the Accusative case feature of the direct object. Hence, the latter is invisible for chain formation. No violation of PRD/cancellation ensues and semantic binding is available as expected.

Fijan is another instance of a language with a locally bound pronominal (Dixon 1988, Levinson 2000). However, as shown by Schadler (2014), it falls in the same category as Khanty; here too, an intervening affix prevents the pronoun from entering the chain.

Similarly, we must isolate the grammatical factor accounting for the difference between languages with pronominal and with reflexive possessives. The relevant configuration is essentially the same as in (39)/(41), repeated here with one additional factor, namely the boundary of the DP containing the possessive:

- (39)' [DP_{valφ} [T_φ [... [v/V_φ ... [DP SE_{uφ+Gen} ...]]]]
 (41)' [DP_{valφ} [T_φ [... [v/V_φ ... | [DP PRON_{valφ+Gen} ...]]]]
 X

As argued in Despić (2015) and Reuland (2011a), the crucial parameter is the requirement of prenominal definiteness marking, which creates a barrier for chain formation. In languages requiring it, no Agree chain can be formed, hence the possessive is realized as a pronominal; in languages not requiring it, from Scandinavian (with postnominal definiteness marking), to Latin and the Slavic languages that don't require definiteness marking at all, an Agree chain can be formed; hence these have a possessive reflexive.

This paves the way for an understanding of why in many languages 1st and 2nd person pronominals may be locally bound.

5.1.2 Local binding of 1st and 2nd person pronominals.

pronominal case paradigm that is visible in 3rd person plural *se* versus *har(ren)* and 3rd person feminine singular *se* versus *har*. *Se* is just a pronominal form (not to be confused with a SE-anaphor), alternating with *har(ren)*. But it is limited to structural Case positions, and, crucially, *cannot be locally bound*. Note that Van Gelderen (2000) shows that Old English, another language with locally bound pronominals, lacked structural accusative Case. The analysis of Frisian given here has been criticized by Rooryck and Vanden Wyngaerd (2011). However, this criticism ignores the difference between features being unvalued and the effects of syncretism (discussed in Reuland 2011a: Ch. 5), hence misses the point

One common line has been that 1st and 2nd person pronominals are ambiguous between 'anaphor' and 'pronominal'. This, however, is non-explanatory and leaves the question of why this ambiguity would be pervasive in 1st and 2nd person and not in 3rd person. The solution lies in the PRD. As stated, an occurrence of a feature cannot be overwritten by/unified with another occurrence of that feature unless this doesn't limit interpretive options. Person features don't have descriptive content, but contribute to the interpretation in the following manner.

1st person *I* and 2nd person *you* reflect the speaker and hearer roles respectively, whereas 3rd person is neither speaker and nor hearer. 1st and 2nd person pronominals are thus restricted in terms of the discourse individuals they pick out. 3rd person pronouns, however, are not so restricted. They can pick out any individual from the domain of discourse. Thus, within one reportive context occurrences of 1st person are interchangeable. Hence overwriting/unifying features in different occurrences of a 1st person pronoun (singular or plural) does not violate PRD.⁷ The same applies to other elements expressing orientation, such as 2nd person pronominals. The same fact underlies the phenomenon that in those languages (such as Vietnamese) where proper names are conventional forms of address – hence express orientation – these too can be locally bound (see also the discussion in Boeckx, Hornstein and Nunes 2007 of Hmong and San Lucas Quiavini Zapotec, where proper names, though not descriptive noun phrases allow local binding).

In short, where PRD is not violated, pronominals and their kin allow local binding. This can be summarized as the condition on feature chains in (42):

(42) *Condition on feature chains*

Given a derivation yielding a structure with a sequence of heads H_i , a DP, and a Pronoun, such that the heads mediate in forming a feature chain between DP and Pronoun, this derivation is cancelled if it violates a fundamental property of grammar.

Such violation may consist of non-satisfaction of PRD, but also the formation of an impossible chain with conflicting features.⁸

This still leaves the question of why *I washed me*, etc., is ill-formed in English. This question will be addressed in section 6.4.

5.2 Reflexivity of predicates: Why is it special?

As noted in section 4.3, languages systematically avoid the simplest way of expressing reflexivity namely by the subject of a transitive verb binding an object pronoun, as in (43):

(43) a. $DP \text{ Verb}_{\text{Trans}} \text{ pronoun}$

⁷ This is unaffected by Jim McCawley's famous sentence "I dreamt that I was Brigitte Bardot and that I kissed me". Here two contexts are intertwined, the dream context and utterance context, so the condition referred is nevertheless met. (Moreover, no chain formation is involved anyway.)

⁸ As in a restriction on the binding of the two 1st person plural pronominal forms *nós* and *a gente* in Brazilian Portuguese (Menuzzi 1999, Reuland 2011a).

- b. DP ($\lambda x (V_{\text{Trans}} x, x)$)

The fact that the PRD rules out 3rd person personal pronominals in the position of *pronoun* does not yet account for the contrast between SE-anaphors and SELF-anaphors. The descriptive generalization underlying Reinhart and Reuland (1991, 1993), is that reflexivity must be licensed by reflexive-marking, as in (44):

- (44) Condition B (Reinhart and Reuland 1993)
A reflexive semantic predicate is reflexive-marked

Reflexivity is licensed by a SELF-anaphor, or by the predicate being lexically reflexive. Thus, although the condition on feature chains is not violated (*zich* is unspecified for number and gender), (45b) is ill-formed with *zich* since the verb *bewonderen* 'admire' is neither reflexive marked by a SELF-anaphor, nor lexically reflexive. (45a) is fine with *zich*, since *wassen* 'wash' is lexically reflexive, and (45c) with *zich* is fine since *Jack* and *zich* are not semantic coarguments:

- (45) Dutch
- | | | |
|----|---|-----------------|
| a. | <i>Jack waste zich/*hem</i> | SE-anaphor |
| | Jack washed | |
| b. | <i>Jack bewonderde zich*(zelf)/*hem(zelf)</i> | complex anaphor |
| | Jack admired himself | |
| c. | <i>Jack voelde [zich/*hem wegglijden]</i> | SE-anaphor |
| | Jack felt [SE slip away] | |

Consider again the structure of (43a) taking the option where the object is realized as a SE-anaphor, and adding the syntactic structure (taking the external argument to be the specifier of the VP, as in (46):

- (46) [_{VP} DP [_{V'} Verb_{Trans} SE]]

After QR and λ -insertion a reflexive predicate should result, but the question is how the arguments are represented at the interface:

- (47) DP ($\lambda x (V_{\text{Trans}} x, \dots)$)

Blindly applying the rules interpreting SE as a variable, one might expect another occurrence of *x* in the position of the dots, as in (48):

- (48) DP ($\lambda x (V_{\text{Trans}} x, x)$)

This representation faces the following requirement: *Any computational system must be able to distinguish between different occurrences of identical expressions.* But how to distinguish indistinguishable objects in a local domain? The upshot is that the grammatical system cannot.

- (49) Reflexivity must be licensed whenever the *Inability to Distinguish Indistinguishables* (IDI) comes into play.

There is independent evidence that IDI configurations are problematic for grammatical computations (see Leben 1973 for phonology; and Abels 2003, and Richards 2002 for syntax). This is, then, the reason that structures like (51) that would map onto the problematic representation of (48) are avoided (see Reuland 2011, and especially 2017 for more extensive discussion).

IDI reflects a property of linguistic computations that is so fundamental that it also shows up in entailments. This is shown by disjoint reference effects reflected in the distributive/collective contrast in English (see Lasnik 1989):

- (50) a. We elected me
 b. ??We voted for me

Elect is a collective action, but *vote for* is an individual action, hence it is distributive on its first argument. (50b) triggers a disjoint reference effect, unlike (50a). This follows from IDI, since (50b) entails a reflexive instantiation $I(\lambda x (x \text{ voted for } x))$, which (50a) does not.

This appeal to IDI provides a formal basis for an earlier intuition expressed in Farmer & Harnish (1987: 557), who argue that there is a *Disjointness presumption* on arguments, unless 'they are marked otherwise'. In the present approach marking is required because of IDI, a formal property of computations. What this marking does will be outlined in the next section.

6 Licensing reflexivity

Given that the problem resides in the presence of two identical variables as arguments of the same predicate, there are two ways to remedy that. Both involve some sort of a compromise. One is to use a reduced form of the predicate with only one argument variable, which semantically is a good enough approximation, as in Reinhart (2016, Reinhart and Siloni 2005), see section 6.4. The other is to use for one of the arguments an expression that is formally different, but semantically can make do. That is, a structure is used that provides the variable with *protection*.

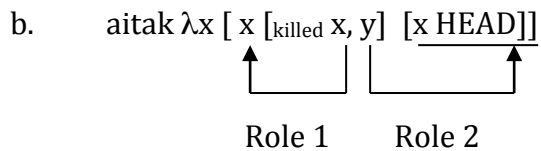
6.1 Licensing reflexivity by protection

As we saw, many languages use *complex anaphors* for the expression of reflexivity.

The role of the complexity marker is illustrated in (51) and (52), using Dutch and Basque as examples:

- (51) Alice $\lambda x [x \text{ [bewondert } x, y] \text{ [x ZELF]}]$
-

- (52) a. aitak [bere burua] hil du
 father his head kill has
 'The father killed himself.'



Due to the presence of *zelf* or *head* the arguments remain formally distinct. Hence, the variables on the grid of the verb that are linked to these arguments are not identified by the binding process, and IDI does not come into play. This helps explain the statue readings of complex reflexives. The interpretation of complex reflexives is represented in (53). *f* stands for the *self*-function or the *head*-function, and maps *x* onto an element that is close enough to the antecedent of *x* to stand proxy for it.

(53) λx (P (x, f(x)))

Thus, *himself* in (14a/15a) is interpreted as some function of Ringo with a value that can serve as a proxy for Ringo. Such values include the person Ringo, but also his portraits, statues, etc. This is the same in Dutch, and the other languages mentioned in section 4.3. It is significant that this effect has been demonstrated in languages as remote from English as the languages reported there.

The existence of semi-reflexives in a substantial number of languages now ceases to be surprising. Semi-reflexives are just expressions that meet the condition in (54):

(54) Semi-reflexives are deficient enough not to cause a chain condition violation and complex enough to license reflexivity by protecting the argument variable.

So, Bahasa Indonesia *dirinya* is composed of a bodypart noun *diri* with a pronominal possessive *nya*. Meadow Mari *škenže* consists of a nominal stem *šken-* (derived from a word ‘soul, spirit’) and a possessive suffix, expressing the number and person of the antecedent. Both are complex and therefore provide the protection IDI requires.

From the logic of the argument it follows that there are more ways to avoid the IDI effect. Any structure in which binder and the variable are not strictly coarguments serves this purpose. Hence the doubling of pronouns mentioned in section 4.3, and illustrated by Tsakhur in (55):

(55) rasuly-ē [wudž-ē wudž] yaramališ-aʔ-u
 Rasul-Erg Refl.1-Erg Refl.1.ABS wound-1.do-PF
 ‘Rasul wounded himself.’ (Toldova 1999)

Zande [Niger-Congo], uses yet another strategy where the reflexive interpretation uses a pronominal embedded in a PP (Tucker & Bryan 1966):

(56) Mì-ímí tí-rε'
 I-kill on-me
 ‘I kill myself.’

In Khanty the element responsible for the complexity is the object agreement marker (also the factor obviating a chain condition violation), as in (57) (see Volkova and Reuland 2014 for details).

- (57)
- a. Učitel-t_i live_{i/k} išək-s-əl-əl.
 teacher-PL they.ACC praise-PST-PL-3PL
The teachers praised them(selves).
- b. Subject_[Pers;Num] Object_[Num] Verb-T-O_{NUM.SPERS;NUM}
-

A similar situation obtains in Fijian, which, as mentioned in section 5.1.1, also allows locally bound pronominals. Schadler (2014) presents an analysis based on the status of the object marker *-Ci*. As Schadler shows, *-Ci* both prevents a chain and provides the complexity needed to license reflexivity.

We have a yet other form of protection namely licensing by intervention.

6.2 Licensing by intervention

Licensing by intervention occurs when the anaphor is not directly bound by the subject, but covalued by feature sharing. This happens, for instance, with reflexive clitics in Romance. Despite their similarity to SE-anaphors like Dutch *zich*, reflexive clitics such as French *se* and Italian *si* behave like complex anaphors in that they give rise to proxy-interpretations (see Labelle 2008, Reuland 2011a). They can be used with all verbs, including subject experiencer verbs (Reinhart and Siloni 2005). This fact can be explained on the basis of their defining property as syntactic clitics: after insertion in argument position they move into the functional domain. Being a clitic, *si* is associated with its own λ -abstract (Baauw and Delfitto, 2005; Marelj and Reuland, 2016), intervenes below the subject and binds the variable in its base position. After cliticization and quantifier raising of the subject the structure in (58) obtains.

- (58) $DP_{\phi} (\lambda x (si_{\phi} (\lambda y (V x y))))$

The subject is thus prevented from *binding* the object variable. The Agree relation between the subject DP and *si* causes the two arguments of the predicate to be *covalued*. Yet, they remain *formally* distinct and IDI does not apply. The availability of proxy-readings just follows from the fact that pronouns in general allow proxy readings.

An intervention effect can also occur with the intervener in another position. This obtains in the case of German *sich* (Reuland 2011a), but also in Mashan Zhuang, a Tai-Kadai language discussed by Schadler (2014, 2017).

Finally, a further possible strategy consists in *separation*; that is realizing the two arguments as part of different predicates as illustrated in (59).

- (59) $DP V_1 [V_2 \text{ Pron}]$


This is similar to what we saw in Zande.

6.3 Protecting and enforcing

Condition A of the CBT expresses that anaphors such as *himself*, *zichzelf*, etc. aren't just licensers, but must also be locally bound. Reinhart and Reuland (1991) and Reuland (2011a) derive the effects of condition A from an analysis of SELF as a reflexivizing operator on predicates (see Keenan 1988 for an earlier analysis along such lines). Thus reflexivity is *enforced*, even if a reflexive interpretation ends up being impossible due to a feature mismatch.

If *self* is a reflexivizer, the ill-formedness of (60) follows without recourse to indices since on the one hand, *self* enforces reflexivity of the *invite*-predicate, and other *the queen* cannot bind *himself* due to a feature mismatch. Also the impossibility of split antecedents immediately follows.

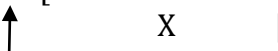
(60) *Max boasted [that the queen (*self*)-invited **himself** for a drink]



Licensing by protection and enforcing are distinct properties. A licenser need not be an enforcer as we saw.

An enforcer applies blindly where its structural conditions are met, regardless of whether the result is sense or nonsense. Reinhart and Reuland (1991) and Reuland (2011a) argue that one step in the reflexivization process by *self* in English is syntactic. That is, *self* attaches to the verb by covert movement.⁹ If so, the exemption effects follow. If *self*-movement is subject to syntactic restrictions on movement it should be impossible to move *self* from a coordinate structure (the coordinate structure constraint, CSC, Ross 1967), or from an adjunct (the condition of extraction domains, CED, Huang 1982). The effect is illustrated in (61).

(61) Max boasted that the queen invited [Lucie and **himself**] for a drink



Since *self* cannot adjoin to the verb, it is not able to reflexivize it, and *himself* is interpreted as a (logophoric) pronoun.¹⁰ Hence, *Max* is a possible antecedent for *himself* despite the fact that it is farther removed from it than in (60).

All full reflexives such as Meadow Mari *škenžam ške* or Bahasa Indonesia *dirinya sendiri* discussed in section 2 are both licensers and enforcers.

While English *himself* gives rise to exemption effects in these positions, Dutch *zichzelf* does not, nor do, for instance, Meadow Mari *škenžam ške*, or Bahasa Indonesia *dirinya sendiri*.

The effect in English depends on one specific syntactic step, namely the restrictions on covert SELF-movement, together with the fact that the other component – *him-* is not deficient. In the case of Dutch *zichzelf*, the *zich*-part, which is deficient, is able to enter an Agree chain, even where *zelf*-movement is

⁹ A general economy principle that expressing a dependency in syntax is preferred over postponing this to the interpretation system may provide a trigger for this movement (see Reuland 2011a for discussion).

¹⁰ See Reuland (2005, to appear) for an overview of the extensive literature on logophoricity.

available, since coordinate structures and adjuncts are not islands for Agree.¹¹ This contrast is illustrated in (62):

- (62) a. John realized that I hated everyone except himself]
 b. **Jan* realiseerde zich dat ik iedereen haatte [behalve *zichzelf*/^{Ok}
hemzelf]

The final question is the trigger for *self*-movement. Although one could postulate a morpho-syntactic feature as a trigger, this would be hard to reconcile with the fact that where it cannot apply the derivation does not crash, but *himself* is just interpreted as a logophoric pronoun. Hence, Reuland (2011a) proposes that the trigger resides in economy: *self*-movement in syntax is the most economical way to encode the dependency, hence the syntactic route is taken where possible.

6.4 Affixal reflexives: reflexivization by bundling

As indicated in the beginning of this section, the effect of IDI can also be resolved by an operation on the argument structure of the predicate. Natural language has a set of operations on argument structure that are independently needed to account for alternations between transitives like *open* in *Alice opened the door*, and their one-place alternants as in *The door opened*, or between *John worries about his health* versus *His health worries John* and *John worries* (Reinhart and Siloni 2005, Reinhart 2016). One of these is *bundling*.

Bundling reduces the internal argument of a two-place predicate and bundles the internal role (theme) and the external role (agent) into a composite agent-theme role, as in (63):

- (63) Bundling:
 a. $V_{acc}(\theta_1, \theta_2) \rightarrow R_s(V)(\theta_{1,2})$
 (where $\theta_{1,2}$ stands for the Bundling of θ_1 and θ_2)
 b. $V[Agent]_1 [Theme]_2 \rightarrow V[Agent-Theme]_1$

The result is that the predicate is morpho-syntactically detransitivized. So, instead of $*V_{Trans}(x)$, we have $V'_{Intrans}(x)$, and the thematic roles $[\theta_1]$ and $[\theta_2]$ of V_{Trans} are bundled as in $V'_{Intrans}[\theta_1, \theta_2](x)$ and jointly assigned by $V'_{Intrans}$ to x .

The restriction on affixal reflexivization noted in section 3.2 can now be formulated as a restriction on bundling as a lexical operation:

- (64) *Restriction on (lexical) bundling*
 Bundling is restricted to Agent-Theme verbs

¹¹ Chomsky (2001, 2008) proposed that syntactic operations are restricted in their application to small chunks of structure, *phases*. To the extent in which anaphoric dependencies are encoded by syntactic operations one would expect them to reflect the phasal restrictions these operations are subject to. There is a considerable literature on anaphor binding and phases. However, as yet, this literature leaves open the particular means of encoding, which makes their specific claims hard to evaluate (see Reuland 2017 for references and discussion).

Thus, one finds bundling with verbs such as English *wash* or Dutch *verdedigen* 'defend', but not with verbs such as Dutch *bewonderen* 'admire', Russian *nenavidet* 'hate', Khanty *nuomti* 'remember', or Sakha *tapt-* 'love', as these are all *subject experiencer* verbs.

Transitive verbs are associated with a structural accusative case on the object (leaving open what property of the verbal projection is involved).

In some languages with a "marginal" Case system, accusative Case may be eliminated under bundling. Hence, in English we find *John washed* with a reflexive interpretation, but no syntactic object. This brings us back to a puzzle noted in section 5.1.2. If all other Germanic languages allow locally bound 1st and 2nd person pronominals, why doesn't English? The answer is just a consequence of the fact that bundling in English eliminates accusative case. If bundling applies, there is no case, hence a pronominal such as *me* will not be licensed.¹²

That we also find *X washed Xself* is due to the fact that there is no obligation for the transitive entry *wash* to undergo bundling. Here we have an instantiation of the transitive predicate *wash* of *Jack washed Jill* with reflexivity licensed by protection.

In Dutch bundled entries have the simplex anaphor *zich*, since bundling leaves a residual Case. Being an uninterpretable feature it must be checked and eliminated. This what *zich* does. So, in Dutch we find *Jan waste zich* instantiating the reduced entry, *Jan waste zichzelf* as an instantiation of the non-reduced entry, but only *Jan haatte zichzelf*, since *haten* 'hate' cannot undergo bundling and reduction. Since *zich* is inserted to check a residual accusative case, it is not interpreted as a semantic argument. Hence it does not give rise to statue readings. The claim is, then, that in principle the affixes in affixal reflexives are just there to license an operation on argument structure. This applies to *sja* in Russian *myt* 'wash' versus *myt'sja* 'wash_{REFL}', Khanty *-ij(t)* in *l'oxatti* 'wash' – *l'oxatijtti* 'wash oneself', or *-n-* in Sakha (Vinokurova 2005), etc.

This brings us back to the compositionality of reflexive affixes in (21). The upshot is that these affixes are not themselves the carriers of a semantic operation. They cannot be interpreted as operators that apply to a 2-place predicate and yield a 1-place predicate.

Although clitics can be inserted as argumental reflexives, as discussed in 6.2, they can also be inserted to check a residual case after an operation on argument structure (Marelj and Reuland 2016), like affixes.

Reinhart and Siloni's approach accounts for the apparent polysemy of such elements, as contributors of reflexivity, reciprocity, and passive or middle interpretations. There is in fact no polysemy. Verbal argument structure has a number of possibilities to be realized in syntax. These elements are just there to 'smoothen' the insertion by taking care of a formal obstacle such as a residual case.¹³

¹² Moreover, *I bought me a book* is just fine, see Reuland (2011a: Ch 8) for more discussion.

¹³ It has been claimed that the choice between *zich* and *zichzelf* in languages like Dutch is claimed is based on concepts such as *+/_ naturally reflexive*, or *+/_ self-directed* (for instance König and Siemund 2000). These concepts have no independent definition, though. It remains unclear why *ontwapenen* 'disarm'

7. Summary and conclusion

For the investigation of the anaphoric systems of individual languages, especially those that have been less well studied, the following checks are important:

- 1 Split antecedents (5)
- 2 Proxy test (15)
- 3 Object comparison (16)
- 4 Quantificational antecedent (26)
- 4 Adverb modification (32)
- 5 Full person paradigm check (37)
- 6 Check for licensing versus enforcing
- 7 Check for the effect of syntactic position

The patterns discussed seemed complex. Yet, they can be accounted for on the basis of the morpho-syntactic properties of the 'reflexivizing' elements and their syntactic environment, together with a number of universal principles:

1. A distinction between binding and co-valuation (Heim 1982, Reinhart 1983);
2. A definition of A-binding as in (28);
3. An Agree-based encoding of interpretive dependencies in syntax (modulo cancellation as an effect of PRD in (42));
4. The effect of IDI in (49) on the representation of reflexive predicates which requires:
 - 4.1 Licensing reflexivity by protection
 - 4.1.2 Distinguishing between licensing and enforcing of reflexivity
 - 4.1.3 Economy, enforcing reflexivization by SELF-anaphors and their kin where possible.
 - 4.2 Licensing reflexivity by bundling
 - 4.2.1 A restriction on bundling to agent-theme verbs
 - 4.2.2 Variation in the effect of bundling on case assignment by the verb.

Despite the title of this overview, we may conclude that there is no unified notion of what a reflexive is. Yet, reflexives do have a shared core, namely their role in licensing reflexivity.

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ATD: Anaphora Typology Database language.link.let.uu.nl/anatyp/

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would be naturally reflexive (it must be since it allows *zich*), or why *bewonderen* 'admire' could not be (it cannot be since it requires *zichzelf*). Although it is not yet understood why bundling is restricted to agent-theme verbs, the thematic structure of verbs can be independently determined.

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