

# Reflexives and Reflexivity

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## Abstract

This article provides an overview of the various means that languages use to represent interpretive dependencies and reflexive predicates. These means are exemplified on the basis of a broad variety of languages. The patterns are prima facie complex, involving semireflexives, full reflexives, and affixal reflexives. Yet they can be accounted for on the basis of the morphosyntactic properties of the elements involved, together with the way these elements interact with a number of universal principles and the syntactic environment. The central principles involved are (a) a principle restricting chain formation by Agree and (b) a general principle applying to reflexive predicates that requires them to be licensed, either through the addition of structural complexity for protection or through a lexical bundling operation, governed by (c) an economy principle. Although I conclude that there is no unified notion of what a reflexive is, reflexives do have a shared core, namely their role in the licensing of reflexivity.



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## 1. BACKGROUND

The terms reflexive and anaphor are often—especially in the generative literature—used virtually synonymously 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.<sup>1</sup> I begin by 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 first, second, and third), class (mostly gender: masculine, feminine, and neuter; but different classification systems exist as well), and number (mostly singular and plural) (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, they also lack a specification for person (e.g., Russian *sebjja*, reflexive clitics in other Slavic languages). However, one also finds more complex forms (e.g., English *himself*) that are dependent because of a property of their second component, and need not be deficient in phi features. In this article, I use the term pronoun as a cover term for anaphors and pronominals.

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

- (1) Binding conditions of the CBT
  - A: An anaphor is bound in its governing category.
  - B: A pronominal is not bound 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 posits that anaphors are locally bound (shorthand for being bound in their governing category), whereas pronominals are not, which entails strict complementarity between anaphors and pronominals. However, complementarity does not always obtain (here and below, underlining is used in the examples to represent expressions having the same semantic value):

- (2) Max put the book behind him/himself.

Moreover, in many languages (including Dutch and Norwegian), one finds elements that appear to be anaphoric in the sense that they need a linguistic antecedent, but yet allow this antecedent to be outside their governing category:

- Norwegian
- (3) Jon bad oss forsøke å få deg til å snakke pent om seg/him.  
 Jon asked us (to) try to get you to talk nicely about SE/him  
 ‘Jon asked us to try to get you to talk nicely about him.’  
 (Hellan 1988)

<sup>1</sup>In some of the literature, the term anaphor may also refer to any use of an expression that refers to a previously mentioned individual or object, but this is not the sense intended here.

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

- (4) Pronominals allow split antecedents (that is, two different NPs together may serve as their antecedent), whereas anaphors do not.

This test is illustrated by the following contrast:

Dutch

- (5) *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.’

Here, *hen* can be interpreted as *Alice* and *de hoedemaker* ‘the Hatter’ jointly, suggesting that it is a pronominal, but *zich* cannot, despite that fact that this interpretation is strongly favored by the discourse. On the basis of this test, *zich* qualifies as an anaphor. If so, this raises the question as to why *zich* and its cognates in Scandinavian can be nonlocally bound. A discussion of nonlocal binding is beyond the scope of this review, though (see Reuland 2011a, 2017a for a detailed account).

## 2. INTRODUCING SEMIREFLEXIVES

Many languages have elements that should qualify as pronominals on the basis of the above test, 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 English *himself* also allows split antecedents. This pattern can be illustrated in Javanese. Javanese has an expression *awak-e dee dewe* ‘body-3SG.GEN 3SG self’ that patterns like an anaphor in that it must be locally bound and does not allow split antecedents. It also has a third-person pronominal *dee* that cannot be locally bound. In addition to these forms, it has an expression *awake-e dee* that can be locally bound but also allows split antecedents in the plural (see Kartono 2013, Schadler 2014 for many more relevant examples and discussion):

Javanese (Malayo-Polynesian)

- (6a) John<sub>i</sub> ndelok awak-e dee<sub>i,j</sub>.  
 John see body-3SG.GEN 3SG  
 ‘John saw himself.’/‘John saw him.’
- (6b) Tono<sub>i</sub> ngabari Tini<sub>j</sub> nek awak-e dee uwong<sub>i+j</sub> lulus ujian.  
 Tono inform Tini that body-3PL.GEN 3rd PL (= people) pass exam  
 ‘Tono informs Tini that they passed the exam.’

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, p. 64). As Schadler notes, Malayalam (Dravidian) *taṅṅal-e tanne* (Acc, Plur) also allows both 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*, which 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 nonlocal antecedents:

Meadow Mari (Uralic)

- (7a) Kažne ajdeme<sub>i</sub> šken-ž-əm<sub>i</sub> (ške)/tud-əm<sub>\*i/j</sub> jörat-a.  
every man self-p.3sg-acc self love-prs.3sg  
'Every man likes himself.'
- (7b) Pet'a<sub>i</sub> Jövan-lan<sub>j</sub> kartəčk-əšte šken-əšt-əm<sub>i+j</sub> onč-əkt-en.  
Petja Ivan-dat photo-iness self-p.3pl-acc see-tr-prt  
'Petja showed to Ivan them(selves) on the photo.'
- (7c) Üdər<sub>i</sub> rveze<sub>j</sub> de-č' [Ø<sub>j</sub> ška-lan-že<sub>i/j</sub> pört-əm əšt-aš] jod-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 of the CBT requires an anaphor to be bound in its governing category. There is, however, a well-known class of exceptions to this condition. In coordinate structures, in adjunct positions, and in picture NPs, *himself* is exempt from the local binding requirement (e.g., Ross 1970; Zribi-Hertz 1989; Pollard & Sag 1992; Reinhart & Reuland 1991, 1993):

- (8a) Max expected [the queen to invite [Mary and himself] for a drink]
- (8b) John<sub>i</sub> was going to get even with Mary. That picture of himself<sub>i</sub> in the paper would really annoy her, as would the other stunts he had planned  
(Pollard & Sag 1992)

In such positions *himself* also allows split antecedents, as in sentence 9 in contrast to sentence 10:

- (9) John<sub>i</sub> asked Mary<sub>j</sub> [PRO<sub>j</sub> to hide those pictures of themselves<sub>i+j</sub>]
- (10) \*John<sub>i</sub> asked Mary<sub>j</sub> [PRO<sub>j</sub> to hide themselves<sub>i+j</sub>]

These are not marginal facts. Every approach to anaphoric relations must 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, then, is how to understand the status of such elements. Cole et al. (2008) classify elements like Javanese *awak-e dee* as “Binding Theory–exempt anaphors” (see also Cole et al. 2015). However, this characterization does not tell us why these elements behave this way.

Expressions such as Meadow Mari *škenže* and Javanese *awak-e dee* in argument position can be locally bound, but need not be. Because they also have the property of allowing split antecedents, Kartono (2013) and Volkova (2014, 2017) refer to them as half-reflexives or semireflexives; I use the latter term below. I employ the term full reflexive to refer to elements like Meadow Mari *škenžəm ške* or Javanese *awak-e dee dewe* if necessary to contrast the two types.

The term semireflexive is by itself no more explanatory than Cole et al.’s (2008) term “Binding Theory–exempt anaphor.” One of the goals of this review, therefore, is to provide a more explanatory perspective on the types of reflexives and the distribution of their antecedents. My aim is complementary to that of Déchaine & Wiltschko (2017), who present an illuminating overview of reflexives based on their internal morphological composition. This review focuses on the relation between the “internal” and “external” grammar of reflexives.

### 3. REFLEXIVE AFFIXES

Many languages have affixes that *prima facie* play the role of reflexives, such as *himself* in English. For instance, Russian has the affix *-sja* (or *-sj* after vowels) in addition to *sebjä*.

Again, such affixes exist 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:

Meadow Mari (Uralic)

(11a) Jəvan-ən    ava-že                    küvar-əm    mušk-ən.

Ivan-gen    mother-p.3sg    floor-acc    wash-prt

‘Ivan’s mother washed the floor.’

(11b) Jəvan    mušk-əlt-ən.

John    wash-aff-prt

‘John washed.’

The same is true for the other Uralic languages mentioned above, including their more distant relative Tegi Khanty. Tegi Khanty has a specific reflexivization strategy based on the suffix *-ij(ł)* and one based on a pronominal (discussed further below):

Tegi Khanty (Uralic)

(12a) Łuv    łuveł                    l’oxət-s-əHe.

he    he.acc    wash-pst-sg.3sg

‘He washed himself.’

(12b) Łuv    l’oxət-ij-s.

he    wash-aff-pst.3sg

‘He washed.’

Bahasa Indonesia (Malayo-Polynesian) also employs the affix-like *diri* in addition to the semireflexive *diri-nya* and the full reflexive *diri-nya sendiri*.

The use of so-called reflexive affixes is widespread crosslinguistically. In some languages the element is dedicated to the expression of reflexivity (Bahasa Indonesia *diri*); in others it has a broader distribution. Geniušienė (1987) presents an overview of the various roles of reflexive affixes and clitics in Slavic, Baltic, and other Indo-European languages, in which one and the same element may perform a role in 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; nevertheless, they show a high prevalence of the use of reflexive affixes. In at least 21 languages (43.75%) of Franssen’s 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 simply reduced forms of an anaphor, or are there more substantive differences? These questions have not yet been investigated for all of the languages involved. But in cases in which such research has been carried out, the results do 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 by Jackendoff (1992), who notes that *himself* in English does not always have a strictly reflexive interpretation. Grooming verbs in English allow two ways of expressing reflexivity, by a reflexive direct object or by omitting the direct object:

(13a) Ringo washed himself.

(13b) Ringo washed.

Intuitively, sentence 13*b* is also reflexive, but there is no direct evidence for a separate object argument. This can be seen from the proxy test: The reflexive *himself* in sentence 13*a* can be interpreted either as the person Ringo or as Ringo's wax statue. Crucially, however, in sentence 13*b* a proxy interpretation as a statue is not available:

Proxy test

(14a) {Upon a visit to Mme Tussaud wax museum,} Ringo washed himself.

(Theme: <sup>OK</sup>Ringo, <sup>OK</sup>Ringo's statue)

(14b) {Upon a visit to Mme Tussaud wax museum,} Ringo washed.

(Theme: <sup>OK</sup>Ringo, \*Ringo's statue)

The simplest explanation is that no object is projected in sentence 13*b*. However, even if one were to argue for a null object (which would then have a special and restricted distribution), it cannot be a standard pronominal, because a general property of pronominals is that they do allow proxy interpretations (Safir 2004, Reuland & Winter 2009). Interestingly, the same contrast is found in Dutch between the reflexives *zichzelf* and *zich* (Reuland 2001, 2011a).

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

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

Object comparison test

(15a) Bill washes himself more often than John.

(15b) Bill washes more often than John.

Sentence 15*a* has two readings. One is that Bill washes Bill more often than John washes John (subject comparison); the other is that Bill washes Bill more often than Bill washes John (object comparison). In sentence 15*b*, however, object comparison is impossible. It does not allow the reading that Bill washes Bill more often than Bill washes John. Because in sentence 15*a* 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 sentence 15*b* is that there is no object argument to begin with.

In English, the contrast is between *himself* and no marking (a purely verbal reflexivization). The other languages discussed above have an overt marker on the verb. But in all of the languages in which the test has been applied (Russian; Meadow Mari and the related Komi-Zyrian, Besermyan

Udmurt, and Shoksha Erzya; Khanty; Bahasa Indonesia), proxy readings are not available (see also Bahasa Indonesia *diri*; Kartono 2013):

- (16a) Meadow Mari  
 {Local context: Gorbachev came to see the wax figures.}  
 Keneta (tudo) šken-ž-əm mušk-aš tüŋjal-ən.  
 suddenly he self-p.3sg-acc wash-inf start-prt  
 ‘Suddenly he started washing himself/the figure.’

- (16b) Meadow Mari  
 {Local context: Gorbachev came to see the wax figures.}  
 Keneta (tudo) mušk-əlt-aš tüŋjal-ən.  
 suddenly he wash-detr-inf start-prt  
 ‘Suddenly he started washing (himself/\*the figure).’  
 (Volkova 2014)

Whereas the various Australian languages with affixal reflexives in Franssen’s (2010) overview probably do involve detransitivization, 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 & Everaert 2014):

- Chicheŵa (Niger-Congo)  
 (17) Alenje á-ma-dzi-nyóz-á kupósá asodzi.  
 hunters SM-Hab-Reflex-despise-FV exceeding fishermen  
 Either: ‘The hunters despise themselves more than the fishermen (despise themselves).’  
 Or: ‘The hunters despise themselves more than (they despise) the fishermen.’  
 (Mchombo 2004, p. 106)

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

### 3.2. A Restriction on Affixal Reflexives

Data are not yet available for all languages, but where available they indicate that affixal reflexivization, and reflexivization without overt marking, 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 (I refer to these as agent–theme verbs) (Reinhart 2016, Reinhart & Siloni 2005). This class includes grooming verbs (e.g., *wash*, *dress*) as well as verbs like *defend* and *disarm*. A class that resists verbal and affixal reflexivization is that of the subject experiencer verbs, such as *hate*, *admire*, and *know*, in which the subject has an experience of which the object is the source. This has been observed in languages as varied as Modern Greek (Papangeli 2004), Russian, Meadow Mari (and the related Komi-Zyrian, Besermyan Udmurt, and Shoksha Erzya; Volkova 2014), Khanty (Volkova & Reuland 2014), and Sakha, a Turkic language spoken in the Sakha Republic of the Russian Federation (Vinokurova 2005):

- Russian  
 (18a) Ivan pomylsja versus Ivan pomyl sebja  
 Ivan washed<sub>refl</sub> Ivan washed himself

(18b)	*Ivan	nenavidelsja	versus	Ivan	nenavidel	sebja
	Ivan	hated <sub>refl</sub>		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:

Sakha (Turkic)

- (19a) 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.’
- (19b) \*Sardaana araldyt-yn-na/tapta-n-ar.  
Sardaana distract-refl-past.3/love-refl-aor  
‘Sardaana distracted herself/loves herself.’
- (19c) Sardaana<sub>i</sub> beje-tin<sub>i/\*j</sub> 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 crosslinguistic investigation. Even so, the thematic limitations on the use of these affixes in reflexive verbs that have been observed so far enable one to draw an important conclusion:

- (20) There is a class of reflexive affixes that are not compositionally interpretable as reflexivizing operators on predicates.

The question, then, is how to understand this result. I return to this topic in Section 6.4.

#### 4. APPROACHING REFLEXIVES AND REFLEXIVITY

Since the development of the CBT by Chomsky (1981), binding theory has been the subject of extensive discussion and further development (e.g., Faltz 1985; Reinhart 1983, 2006; Koster 1985; Everaert 1986; Pica 1985, 1987; Hellan 1988; Zribi-Hertz 1989; Cole et al. 1990; Reinhart & Reuland 1991, 1993; Pollard & Sag 1992; Reuland 1995, 2001; Hornstein 2000; Safir 2004, 2014; Boeckx et al. 2007; Hicks 2009; Kratzer 2009; Rooryck & Vanden Wyngaerd 2011; Charnavel & Sportiche 2016. See also Koster & Reuland 1991, Frajzyngier & Curl 2000, Lust et al. 2000, Cole et al. 2001, König & Gast 2008 for useful collections of articles). Schladt (2000), Heine & Miyashita (2008) and Moyse-Faurie (2008, 2017) offer insightful overviews and discussions of reflexivity in a number of lesser-studied languages. They observe that, overall, these languages do appear to have some special morphosyntactic means to represent reflexivity.

Reinhart (2002, 2016), Marelj (2004), and Reinhart & Siloni (2005) develop an approach to verbal alternations, including the formation of reflexive predicates, that involves operations on argument structure (the Theta System). Another line of research is based on the idea that the verbal system contains one or more functional projections reflecting voice that are involved in the expression of passives, middles, and antipassives and their like, as well as reflexivity (see, e.g., Labelle 2008; for a more general perspective, see Legate 2014). Conceptually and empirically, there are considerable differences between these two approaches (see the various contributions in Everaert et al. 2016 for an assessment).



Space limitations preclude a comprehensive discussion of the various approaches mentioned at the beginning of this section (for a more specific discussion, see Reuland 2011a, 2017a,c; Marelj & Reuland 2016). Since none of these approaches address the full range of facts discussed by Reuland (see Reuland 2011a and subsequent work, e.g., Reuland 2011b; 2017a,c), I take the approach in Reuland (2011a) as my lead throughout the following discussion. My goal is to show that the patterns, although *prima facie* quite complex, can be accounted for by the interplay between three simple and general factors that are not specific to binding: (a) a condition on reflexive predicates, (b) a condition on the syntactic formation of dependencies, and (c) an economy condition.

#### 4.1. A Preliminary Issue: Coreference and Binding

An important distinction to observe is that between coreference and binding. Different linguistic expressions may refer to the same object in some real or virtual world. Along with proper names and expression with descriptive content, pronominals have the ability to pick out an individual from the domain of discourse. This yields coreference between two expressions as an option, but only if both have the capacity to pick out an individual. This is illustrated by the contrast between examples 21*a* and 21*b* (Heim 1982):

(21a) The soldier<sub>i</sub> has a gun. Will he<sub>i</sub> attack?

(21b) No soldier<sub>i</sub> has a gun. \*Will he<sub>i</sub> attack?

Example 21*a* illustrates coreference: The pronominal in the second sentence may pick up the same individual from the discourse as *the soldier*. If so, as indicated by the coindexing, *the soldier* is the antecedent of *he*. In example 21*b*, no such interpretive dependency can be established, as *no soldier*, as a quantificational expression, does not denote an individual that *he* could pick up as a referent. Consequently, the coindexing in example 21*b* cannot be interpreted. There is, however, another type of interpretive dependency that pronominals can enter into, in which *no soldier* (like other quantificational expressions) is able to serve as an antecedent of *he*:

(22) No soldier<sub>i</sub> thinks he<sub>i</sub> will attack.

This dependency is binding. Binding requires the antecedent to c-command the element to be bound (such as the pronominal in example 22), where c-command is defined as in example 23 (Reinhart 1976, 1983). This requirement is not satisfied in examples 21*a* and 21*b*:

(23a) A c-commands B if and only if A is the sister of a constituent C containing B.

(23b) [A [c ... B. . .]]

The contrast between binding and coreference is also illustrated in the following two examples. In sentence 24*a*, *the soldier* refers to an individual in the discourse, and *he* can pick out the same individual. The expression *every soldier* in sentence 24*b* does not refer to an individual; therefore, coreference is not available. Because *every soldier* is not a sister of the constituent containing *he*, binding is not available either; thus, no interpretive dependency can be established:

(24a) The girl who discovered the soldier<sub>i</sub> thought he<sub>i</sub> would attack.

(24b) \*The girl who discovered every soldier<sub>i</sub> thought he<sub>i</sub> would attack.

These examples show that pronominals that are coreferential with an antecedent pose a different type of issue than pronominals that are bound by an antecedent. But the difference becomes clear only when the antecedent is a quantificational DP. This is particularly important in the case of pronominals that are observed to have the same value as an antecedent within their governing category. These constitute a violation of condition B of the CBT only if the dependency is one

of binding, not if it is a matter of coreference (Grodzinsky & Reinhart 1993).<sup>2</sup> Unfortunately, many descriptions of anaphoric systems limit their examples to definite DPs and proper names as antecedents, potentially leaving a significant loose end. Especially in the case of less well studied languages, it is important to apply the test in example 25 before drawing any conclusions about binding theory, in order to rule out that what may look like local binding is just local coreference, which would raise quite different questions:

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

## 4.2. Defining Binding

Binding theory [the theory of A(argument)-binding] describes the interpretive dependencies between “arguments,” that is, phrases in argument positions (also referred to as A-positions). 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 or accusative.

Chomsky (1981) defines binding as follows:

- (26) A binds B if and only if (a) A and B are coindexed and (b) A c-commands B.

This definition assumes that indices have a theoretical status rather than being simply a notational convenience. But, ever since Reinhart (1983), we have known that syntactic indices are problematic, as they cannot receive a uniform interpretation. Chomsky (1995) took this result further, concluding that syntactic indices are not morphosyntactic objects (e.g., no language expresses indices or coindexing morphologically), and therefore have no place in syntactic derivations.<sup>3</sup>

Subsequently, Reinhart (2006) presented a different definition of binding as a grammatical notion that is based on the logical notion of binding, which is needed for independent reasons. To distinguish these notions, grammatical binding is referred to as Argument binding (A-binding for short). Intuitively, (logical) 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 & Kratzer 1998, Büring 2005, Winter 2016 for details). So, in structure 27b the  $\lambda$  operator binds both occurrences of  $x$ , and because  $\alpha$  is a sister of this  $\lambda$  predicate, both occurrences of  $x$  end up being A-bound by  $\alpha$ :

A-binding

- (27a)  $\alpha$  A-binds  $\beta$  if and only if  $\alpha$  is the sister of a  $\lambda$  predicate whose operator binds  $\beta$ .

- (27b)  $\alpha$  ( $\lambda x$  (P ( $x$ . . . . .  $x$ )))

(Reinhart 2006)

In order to apply this definition in cases like sentence 22, in which a descriptive expression like *no soldier* should A-bind the pronoun, the variable that is implicit in such expressions must be made visible for the grammar. This task is achieved through the following procedure for relating syntactic derivations to logical syntax representations: Move the subject *no soldier* from its argument

<sup>2</sup> See Volkova & Reuland’s (2014) testing of locally bound pronominals in Khanty.

<sup>3</sup> In Chomsky’s (1995) terms, they would violate the inclusiveness condition. See Reuland (2011b) for an overview of the problems with indices in syntax. Note that there is a different and technical use of the notion of an index in semantic interpretation (Heim & Kratzer 1998), which is unaffected by these considerations.

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  $\lambda x$  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 only an option, but not enforced, given that *her* may refer to someone else—both will be bound by the prefixed  $\lambda$  operator and will end up being A-bound, as defined above, by the original argument in its adjoined position. Thus, we have the following derivation:

- (28) 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 exactly what is needed to make the notion of linguistic binding precise.

### 4.3. An Initial Discussion of Reflexivity

Prima facie, reflexivity can be regarded as a limiting case of binding, namely binding of one argument of a predicate by another one, as in *Ringo washed himself*. This is what I refer to as coargument binding. The result can in principle be represented as follows (but see Section 6.1 for a modification):

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

However, as discussed in Section 3, in English verbs without an overt object can also have an interpretation that intuitively should fit the bill for being reflexive (as in *Ringo washed* in example 13*b*). This fact necessitates a broader definition of reflexivity:

- (30) A predicate formed of a head P is reflexive if and only if one of its arguments bears two or more of P’s thematic roles.

Whereas example 13*b* 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 & Everaert 2014):

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

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

One of the main questions we have to answer for an understanding of reflexivity is why languages require some special marking to express it. Given that all politicians have a considerable degree of self-admiration, why is it impossible to simply express this as in sentence 32, although in other environments *him* and *his* can be easily bound by *every politician*, as in sentence 33 (even into an adjunct)?

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

Note that we can no longer assume a CBT condition B that prevents sentence 32 (see Section 4.2). In fact, languages systematically avoid this simple way of expressing reflexivity (which can be characterized as “brute force reflexivization”). One pervasive means of doing so is the use of complex anaphors, such as Georgian *tav tavis*, Basque *bere burua*, English *himself*, and Dutch *zichzelf*. Complex anaphors consist of a pronominal or simplex anaphor, such as *zich* (referred to

hereafter as a SE-anaphor), and some additional element. These other elements may have various origins. Some are historically intensifiers and currently virtually empty semantically, such as English *-self* (in *himself*), Dutch *-zelf* (*zichzelf*), Frisian *-sels* (*himsels*), Norwegian *selv* (*seg selv*, *ham selv*), and Icelandic *sjálfan* (*sjálfan sig*) (hereafter, SELF-anaphors). A great many languages use so-called body-part reflexives. Such reflexives are based on an element that occurs independently as a nominal head designating a body part such as *head* or *bones*, but there are also designations such as *soul* or *spirit*. Sometimes the lexical meaning is still transparent in some contexts, as in Georgian (Amiridze 2006) or in Basque, where *bere burua* ‘his head’ is both used to express a reflexive and used literally in a sentence such as *He put the cap on his head* (Hualde & Ortiz de Urbina 2003). Sometimes the lexical meaning is not transparent, 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),<sup>4</sup> Meitei (Sino-Tibetan; ATD), and Lari (Iranian; ATD), use a doubled pronoun. By contrast, as discussed in the previous section, languages also employ a variety of verbal affixes.

Why do languages use such a roundabout way to express reflexivity? Why can’t *him* in sentence 32 simply be bound by *every politician*? Why do languages use a dedicated reflexive form (semireflexive or full reflexive), or attach a special marker to the verb?

A related issue arises for pronominal possessives. Whereas languages such as English, Dutch, and German, as well as all current Romance languages, allow a locally bound pronominal as a possessive, as in *Jack loves his cat*, Scandinavian languages require a possessive anaphor (also known as a reflexive possessive), as in 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 the issue raised by sentence 32, compare the English examples 13*a* and 13*b*, above, with the Dutch and Frisian examples 34*a* and 34*b*, along with the result of replacing the equivalent of *wash* with *bewonderen/bewûnderje* ‘admire’ in examples 35*a* and 35*b*:

- (34a) Ringo waste *zich*/\**hem*/*zichzelf*
- (34b) Ringo waske *him*/*himsels*
- (35a) Ringo bewonderde \**zich*/\**hem*/*zichzelf*
- (35b) Ringo bewûndere \**him*/*himsels*

In Dutch, *wassen* ‘wash’ allows a SE-anaphor but does not allow a pronominal; by contrast, *bewonderen* ‘admire’ requires a complex anaphor. In Frisian, *waskje* ‘wash’ is fine with a pronominal, but *bewûnderje* ‘admire’ requires a complex form. In sum, Frisian allows a pronominal wherever Dutch allows the SE-anaphor *zich*. Importantly, these Frisian pronominals are real pronominals. *Ringo waske him* can just as easily be interpreted as Ringo washing someone else. Thus, explaining why the simple pronominal is ruled out in sentence 32 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* and *bewûnderje* ‘admire’ are not like *wassen* and *waskje* ‘wash’).

<sup>4</sup>ATD refers to the Anaphora Typology Database (<http://language.link.let.uu.nl/anatyp/>).

## 5.1. Local Binding of Pronominals: The Role of Chains

Whereas the number of languages allowing local binding of third-person pronominals is limited, local binding of first- and second-person pronominals is pervasive, as shown by all Germanic and Romance languages, except for English. Why local binding of first- and second-person pronominals is more prevalent than third-person pronominals is an important question. But even at the descriptive level it leads to an important guideline:

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

I begin this section with a discussion of third-person pronominals.

**5.1.1. Third-person pronominals.** The pronominal *bem* may not be locally bound in Dutch, but its counterpart *him* in Frisian allows local binding. The difference cannot be a matter of semantics, as both are semantically treated as variables, and variable binding by itself is not subject to locality restrictions (as illustrated in sentence 37, below, 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, e.g., Chomsky 2001, 2008), the operations that are available to encode interpretive dependencies in syntax are simply Move and Agree. Move can be used to encode a dependency, as a copy shares relevant properties with the element it is a copy of:

- (37) This man I never expected to see  $t_{\text{this man}}$  in the White House.

Thus, to the extent that Move is involved in the encoding of binding, the locality conditions to which Move is subject will be inherited by the binding dependency it encodes.

Agree can be decomposed into two suboperations involving features, namely compare/check and identify/share values. Agree effectively allows for the antecedent to overwrite or fill cells in the dependent element with copies of its own features, thereby identifying the two, as in subject-verb or adjective-noun agreement. Therefore, when Agree is also sensitive to locality, this sensitivity will be inherited by the binding dependency it encodes.

In sum, syntax has precisely one way of representing identity, namely by the relation *y is a copy of x* that underlies both Move and Agree. The way in which Agree encodes binding dependencies is discussed in detail by Reuland (2011a, 2017a) and technically implemented in Pesetsky & Torrego's (2007) theory of feature chains. For the purpose of this review, an informal exposition suffices.

The dependencies involved are summarized as follows:

- (38)  $[DP_{\text{val}\varphi} [T_{\varphi} [\dots [v/V_{\varphi} \dots SE_{\text{u}\varphi + \text{StrAcc}} \dots ]]]]^5$

Here,  $\varphi$  stands for a bundle of phi features; u stands for unvalued; DP stands for the subject, which has a fully valued set of phi features; T represents the tense category carrying the standard agreement features; v/V stands for one or more mediating verbal heads; and SE represents a SE-anaphor such as *zich*, which is deficient for phi features and made visible to chain formation by a structural accusative case feature. The exchange of values in the formation of a feature chain unifies the features it contains. Because feature unification copies or overwrites feature values, all the tokens of  $\varphi$  in structure 38 share instances of their features. And, because such copying/overwriting of feature values encodes identity, a syntactic pre-encoding of the binding

<sup>5</sup>The availability of a derivation is neutral about the upward Agree/downward Agree debate. Although representation 38 reflects upward Agree (Zeijlstra 2012), which is easier for exposition, Reuland (2011a) provides a derivation based on the standard downward Agree.

relation results. Note that, given the way they are formed, chains can have only a single head. This explains the impossibility of split antecedents for binding dependencies formed by chains, and hence why the split antecedents test is a useful tool.

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 deletion (PRD) (Chomsky 1995). Informally, an occurrence of a feature cannot be overwritten by another occurrence of that feature if doing so would limit the interpretive options. A SE-anaphor and its antecedent share only interpretive constants (category, person) (Reuland 2011a), but the pronominal *him* in, for example, *Jack admired him* allows an interpretation in which *him* is someone other than Jack. If *Jack* and *him* were to become members of the same chain, those interpretations would be lost, in violation of the PRD.

This prohibition cannot be bypassed by semantic binding:

- |       |               |                       |               |              |
|-------|---------------|-----------------------|---------------|--------------|
| (39a) | <u>Jack</u>   | voelde                | [ <u>zich</u> | wegglijden]. |
|       | Jack          | felt                  | [SE           | slip away]   |
| (39b) | * <u>Jack</u> | voelde                | [ <u>hem</u>  | wegglijden]. |
|       | Jack          | felt                  | [him          | slip away]   |
| (39c) | Jack          | ( $\lambda x$ (x felt | [x            | slip away])) |

The PRD does not allow representation 39c to be derived from sentence 39b by chain formation, as opposed to sentence 39a. As argued by Chomsky (1995), such a derivation is canceled (i.e., cannot continue). Consequently, there cannot be a derivation in which sentence 39b is interpreted as in 39c by direct semantic binding bypassing the prohibition of chain formation (Reuland 2011a). Notice that the mechanism blocking this derivation does not involve a direct comparison between the *zich* and *hem* options. The *hem* option is blocked in its own right, leaving the derivation from *zich* as the only option.<sup>6</sup>

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

To this end, I begin with a discussion of Frisian, then move on to the Uralic language Khanty, which also allows locally bound pronominals. Finally, I 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 nonstructural case (Hoekstra 1994). Consequently, there is a derivation in which *him* in sentence 34b, which corresponds to the SE position in structure 38, is not visible as a target for entering the chain, as illustrated in structure 40 (indicated by the cross):

$$(40) \quad [DP_{val\varphi} [T_{\varphi} [\dots [v/V_{\varphi} \dots \quad | \text{PRON}_{val\varphi - StrAcc} \dots ]]] \times$$

<sup>6</sup>The proposal in the text is unlike other approaches based on economy, such as those put forward by Reuland (2001), Safir (2004), Boeckx et al. (2007), and Rooryck & Vanden Wyngaerd (2011). All of these proposals predict strict complementarity between anaphors and bound pronominals that in fact does not obtain, as shown in the text. Note that in the view adopted in this article there is no guarantee that a language will have developed a SE-anaphor in positions where a bound pronominal is blocked.

Here there is no violation of the PRD, so the derivation is not canceled. Therefore, semantic binding of PRON by DP in structure 40, corresponding to *him* and *Ringo* in sentence 34*b*, is not blocked.<sup>7</sup>

Note that binding by chains and its restrictions are simply a by-product of general principles of grammar and language-specific morphosyntactic properties. This state of affairs illustrates what we may expect crosslinguistically: Minor differences in morphosyntax may have striking effects at the macro level. This fact is also illustrated by local binding of pronominals in Khanty (Nikolaeva 1995, 1999; Volkova & 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 the language allows local binding of a pronominal in object position. Crucially, however, local binding requires the presence of object agreement. As shown by Volkova & Reuland (2014), object agreement checks the accusative case feature of the direct object. Therefore, the latter is invisible for chain formation. No violation of the PRD ensues. The derivation is not canceled, and semantic binding is available, as expected.

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

Similarly, we must isolate the grammatical factor accounting for the difference between languages with pronominal and reflexive possessives. The relevant configuration is essentially the same as in structures 38 and 40, repeated here with one additional factor, namely the boundary of the DP containing the possessive:

- (38) [DP<sub>valφ</sub> [T<sub>φ</sub> [... [v/V<sub>φ</sub> ... [DP SE<sub>uφ+Gen</sub> ... ]]]]]  
 (40) [DP<sub>valφ</sub> [T<sub>φ</sub> [... [v/V<sub>φ</sub> ... | [DP PRON<sub>valφ+Gen</sub> ... ]]]]]  
 ×

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

**5.1.2. Local binding of first- and second-person pronominals.** As noted at the beginning of Section 5.1, many languages allow local binding of first- and second-person pronominals. A common line of reasoning is that these pronominals are ambiguous between anaphor and pronominal. As an explanation, this is not satisfactory, as it leaves open the question as to why this ambiguity would be pervasive in first and second person and not in third person. The solution lies in the PRD, which entails that an occurrence of a feature cannot be overwritten by or unified with another occurrence of that feature unless this does not limit the interpretive options. Person features have no descriptive content, but rather contribute to the interpretation in the following manner.

<sup>7</sup>It has been suggested that Frisian allows for a simpler explanation, namely the absence of a SE-anaphor as a competitor (Rooryck & Vanden Wyngaard 2011). However, this cannot be the relevant factor. Frisian has a split in the pronominal case paradigm that is visible in third-person plural *se* versus *har(ren)* and third-person feminine singular *se* versus *har*. *Se* is simply 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 provided here has been criticized by Rooryck & Vanden Wyngaard (2011). However, this criticism ignores the difference between features being unvalued and the effects of syncretism (discussed in Reuland 2011a, chapter 5), and hence misses the point.

First-person *I* and second-person *you* reflect speaker and hearer roles, respectively, whereas the third person is neither speaker nor hearer. First- and second-person pronominals are thus restricted in terms of the discourse individuals they pick out. Third-person pronominals, however, are not as restricted. They can be used to refer to any individual within the domain of discourse. Thus, within one reportive context occurrences of first person are interchangeable, so overwriting or unifying features in different occurrences of a first-person pronominal (singular or plural) does not violate the PRD.<sup>8</sup> The same statement applies to other elements expressing orientation, such as second-person pronominals, and underlies the phenomenon that in languages in which proper names are conventional forms of address, and hence express orientation (e.g., Vietnamese), proper names too can be locally bound (see Boeckx et al. 2007 for a discussion of Hmong and San Lucas Quiavini Zapotec, in which proper names, although not descriptive NPs, allow local binding).

In sum, where PRD is not violated, pronominals and their kin allow local binding. This result can be summarized as follows:

(41) Condition on feature chains

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

Such a violation may consist of nonsatisfaction of the PRD or the formation of an impossible chain with conflicting features.<sup>9</sup>

The question remains as to why a sentence like *I washed me* is ill-formed in English. I address this question 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:

(42a)  $\underline{\text{DP}} V_{\text{trans}} \underline{\text{pronoun}}$

(42b)  $\text{DP } (\lambda x (V_{\text{trans}} x, x))$

The fact that the PRD rules out third-person pronominals in the position marked “pronoun” in structure 42a does not account for the contrast between SE-anaphors and SELF-anaphors. The descriptive generalization underlying the account of Reinhart & Reuland (1991, 1993) is that reflexivity must be licensed by reflexive-marking:

(43) Condition B

A reflexive semantic predicate is reflexive-marked.

(Reinhart & Reuland 1993)

As defined by Reinhart & Reuland (1993), a predicate (formed of a head P) is reflexive-marked if and only if either P is lexically reflexive or one of P’s arguments is a SELF anaphor. Thus, although

<sup>8</sup>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 the utterance context, so the condition referred to is nevertheless met. (Moreover, no chain formation is involved.)

<sup>9</sup>As in a restriction on the binding of the two first-person plural pronominal forms *nós* and *a gente* in Brazilian Portuguese (Menuzzi 1999, Reuland 2011a).



the condition on chains is not violated (*zich* is unspecified for number and gender), sentence 44*b*, below, is ill-formed with *zich* because the verb *bewonderen* ‘admire’ is neither reflexive-marked by a SELF-anaphor nor lexically reflexive. Sentence 44*a* is fine with *zich*, given that *wassen* ‘wash’ is lexically reflexive, and sentence 44*c* is also fine with *zich*, because *Jack* and *zich* are not semantic coarguments, so there is no semantic reflexive predicate:

	Dutch			
(44a)	<u>Jack</u>	waste	<u>zich</u> / <u>*hem</u>	SE-anaphor
	Jack	washed		
(44b)	<u>Jack</u>	bewonderde	<u>zich</u> *(zelf)/ <u>*hem</u> (zelf)	complex anaphor
	Jack	admired	himself	
(44c)	<u>Jack</u>	voelde	[ <u>zich</u> / <u>*hem</u> wegglijden]	SE-anaphor
	Jack	felt	[SE slip away]	

Consider again structure 42*a*, taking the option in which the object is realized as a SE-anaphor and adding the syntactic structure (taking the external argument to be the specifier of the VP):

(45) [<sub>VP</sub> DP [<sub>V'</sub> V<sub>trans</sub> SE]]

After QR and  $\lambda$ -insertion, a reflexive predicate should result, but the question is how the arguments are represented at the interface of syntax and the interpretation system:

(46) DP ( $\lambda x$  (V<sub>trans</sub> x, . . .))

If one blindly applies the rules interpreting SE as a variable, one might expect another occurrence of *x* in the position of the dots, as in structure 47:

(47) DP ( $\lambda x$  (V<sub>trans</sub> 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.

(48) 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 why structure 45, which would map onto the problematic representation of structure 47, is avoided (see Reuland 2011a,b, and especially Reuland 2017a for more extensive discussion).

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

(49a) We elected me.

(49b) ??We voted for me.

*Elect* is a collective action, but *vote for* is an individual action; thus, it is distributive on its first argument. Sentence 49*b* triggers a disjoint reference effect, unlike sentence 49*a*. This follows from IDI, as sentence 49*b* entails a reflexive instantiation  $I$  ( $\lambda x$  ( $x$  voted for  $x$ )), whereas sentence 49*a* does not.

This appeal to IDI provides a formal basis for an earlier intuition expressed by Farmer & Harnish (1987, p. 557), who argue that there is a “disjointness presumption” on arguments, unless

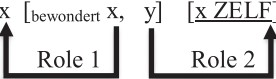
“they are marked otherwise.” In the approach of Reuland (2011a), such marking is required because of IDI, a formal property of computations. What this marking does is outlined in the next section.

## 6. LICENSING REFLEXIVITY

Because the problem resides in the presence of two identical variables as arguments of the same predicate, there are two ways to remedy it. Both involve a compromise. One is to use a reduced form of the predicate with only one argument variable, which semantically is a good enough approximation (Reinhart 2016, Reinhart & 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. More specifically, one uses a structure that provides the variable with protection.

### 6.1. Licensing Reflexivity by Protection

As discussed above, many languages use complex anaphors for the expression of reflexivity. The role of the complexity marker is illustrated below:

Dutch  
 (50) Alice  $\lambda x$  [  $x$  [bewondert  $x$ ,  $y$ ] [ $x$  ZELF] ]  


Basque  
 (51a) aitak [bere burua] hil du.  
 father his head kill has  
 ‘The father killed himself.’

(51b) aitak  $\lambda x$  [  $x$  [killed  $x$ ,  $y$ ] [ $x$  HEAD] ]  


Due to the presence of *zelf* or *head*, the arguments remain formally distinct. Thus, 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 operate. This state of affairs helps explain the proxy readings of complex reflexives. The interpretation of complex reflexives is represented as follows:

(52)  $\lambda x$  (P ( $x$ , f ( $x$ )))

Here, *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. Thus, *himself* in examples 13a and 14a is interpreted as some function of Ringo with a value that can serve as a proxy for Ringo. Such values include not only the person Ringo but also portraits of him, statues, and so forth. The same is true for 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 named there.

The existence of semireflexives in a substantial number of languages now ceases to be surprising. Semireflexives are simply expressions that meet the following condition:

- (53) Semireflexives 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 body-part noun *diri* with a pronominal possessive *-nya*. Meadow Mari *škenže* consists of a nominal stem *šken-* (derived from a word meaning ‘soul, spirit’) and a possessive suffix expressing the number and person of the antecedent. Both are complex and therefore provide the protection IDI requires.<sup>10</sup>

From the logic of this argument it follows that there are additional ways to avoid the IDI effect. Any structure in which the 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 as follows:

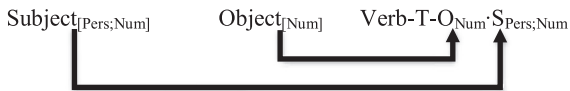
- Tsakhur  
 (54) Rasuly-ē [wudž-ē wudž] yaramališ-aʔ-u.  
 Rasul-Erg Refl.1-Erg Refl.1.ABS wound-1.do-PF  
 ‘Rasul wounded himself.’  
 (Toldova 1999)

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

- Zande  
 (55) Mī-ímí tí-réʔ.  
 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; see Volkova & Reuland 2014 for details):

- (56a) Učitel-t<sub>i</sub> live<sub>i/k</sub> išək-s-əł-əł.  
 teacher-PL they.ACC praise-PST-PL-3PL  
 (56b) ‘The teachers praised them(selves).’



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.

There is yet another form of protection, namely licensing by intervention. I address this topic in the next section.

<sup>10</sup>Readers may wonder about the status of Mandarin *zi-ji*, which may be locally bound and is generally considered to be monomorphemic (Cole et al. 1990; see also Pica 1985, 1987). However, as convincingly shown by Liu (2016) and Wong (2017), this view is mistaken. *Zi-ji* is in fact complex; *zi-* is a verbal prefix that can independently act as a reflexivizer, as in the following example, and *-ji* is analyzed as a pronominal stem. Thus, reflexivity is licensed by complexity.

- (i) Zhangsan      *zi-sha-le*.  
 Zhangsan      REFL-kill-Perf.  
 ‘Zhangsan killed himself.’

## 6.2. Licensing by Intervention

Licensing by intervention occurs when the anaphor is not directly bound by the subject but rather covalued by feature sharing. This happens, for instance, with reflexive clitics in Romance languages. 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 (Labelle 2008, Reuland 2011a). They can be used with all verbs, including subject experiencer verbs (Reinhart & Siloni 2005). These facts 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  $\lambda$ -abstract (Baauw & Delfitto 2005, Marelj & Reuland 2016), intervenes below the subject, and binds the variable. After cliticization and QR of the subject, the following structure obtains:

$$(57) \text{ DP}_\varphi (\lambda x (si_\varphi (\lambda y (V x y))))$$

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 follows from the fact that pronouns in general allow proxy readings.

An intervention effect can also occur with the intervener in another position. This effect obtains in the case of German *sich* (Reuland 2011a, Marelj & Reuland 2016), as well as in Mashan Zhuang (Tai-Kadai), as discussed by Schadler (2014, 2017).

A final possible strategy consists of separation, that is, realizing the two arguments as part of different predicates:

$$(58) \text{ DP V}_1 [\text{V}_2 \text{ PRON}]$$

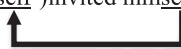
This is similar to the case for Zande.

## 6.3. Protecting and Enforcing

According to condition A of the CBT, anaphors such as *himself* and *zichzelf*, in addition to being licensers of reflexivity, must be locally bound. Reinhart & 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 is ultimately impossible due to a feature mismatch.

If *self* is a reflexivizer, the ill-formedness of sentence 59 follows without recourse to indices because, on the one hand, *self* enforces reflexivity of the *invite* predicate and, on the other hand, *the queen* cannot bind *himself* due to a feature mismatch. Also, the impossibility of split antecedents immediately follows.

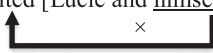
$$(59) \text{ *Max boasted [that the queen (self-)invited himself for a drink]}$$



Licensing by protection and enforcing are distinct properties. A form that licenses reflexivity (a licenser) need not be an enforcer (a form that enforces reflexivity), as demonstrated above.

An enforcer applies blindly where its structural conditions are met, regardless of whether the result is sense or nonsense. Reinhart & 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.<sup>11</sup> If so, the exemption effects discussed in Section 2 are explained by the analysis. 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; Ross 1967) or from an adjunct (the condition on extraction domains; Huang 1982):

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

Because *self* cannot adjoin to the verb, it is not able to reflexivize it, and *himself* is interpreted as a (logophoric) pronoun (with an interpretation that is sensitive to discourse factors).<sup>12</sup> Thus, *Max* is a possible antecedent for *himself* even though it is farther removed from it than in sentence 59.

All full reflexives (see Section 2), such as Meadow Mari *škenžəm ške* or Bahasa Indonesia *dirinya sendiri*, are both licensers and enforcers. Whereas English *himself* gives rise to exemption effects in these positions, Dutch *zichzelf* does not, nor does, for instance, Meadow Mari *škenžəm ške* or Bahasa Indonesia *dirinya sendiri*.

The effect in English depends on one specific syntactic step, namely the restrictions on covert SELF-movement, along with the fact that the other component—*him*—is not deficient in phi features. In the case of Dutch *zichzelf*, the *zich* part, which is deficient, is able to enter a chain formed by Agree, even where *self*-movement is unavailable, because coordinate structures and adjuncts are not islands for Agree.<sup>13</sup> This contrast is illustrated as follows:

- (61a) John realized that I hated [everyone except himself]  
 (61b) \*Jan realiseerde zich dat ik iedereen haatte [behalve *zichzelf*/<sup>Ok</sup>*hemzelf*]

The final question to discuss is what makes *self*-movement obligatory when it can apply (because otherwise reflexivization would not be enforced). The issue is discussed by Reuland (2011a), who concludes that the simplest answer is that the obligatoriness is due to economy: Encoding interpretive dependencies in syntax is more economical than encoding them in semantics or discourse (see also Koorneef & Reuland 2016). In the case of *himself*, *self*-movement in syntax is the most economical way to encode the dependency between *himself* and its antecedent, so the syntactic route is taken wherever possible.

#### 6.4. Affixal Reflexives: Reflexivization by Bundling

As indicated at 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*, as in *Alice opened the door*, and their one-place alternants, as in *The door opened*; or between *John worries about his health* and *His health worries John* or *John worries* (Reinhart & Siloni 2005, Reinhart 2016). One of these operations is bundling.

<sup>11</sup>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).

<sup>12</sup>See Reuland (2017b) for an overview of the extensive literature on logophoricity.

<sup>13</sup>Chomsky (2001, 2008) proposed that syntactic operations are restricted in their application to small chunks of structure, namely phases. To the extent that 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, this literature leaves unresolved the particular means of encoding, making its specific claims hard to evaluate (see Reuland 2017a for references and discussion).

Bundling reduces the internal argument of a two-place predicate and combines the internal role (theme) and the external role (agent) into a composite agent–theme role:

- Bundling
- (62a)  $V_{\text{acc}}(\theta_1, \theta_2) \rightarrow R_s(V)(\theta_{1,2})$   
 (where  $\theta_{1,2}$  stands for the bundling of  $\theta_1$  and  $\theta_2$ )
- (62b)  $V[\text{agent}]_1 [\text{theme}]_2 \rightarrow V[\text{agent–theme}]_1$

The result is that the predicate is morphosyntactically detransitivized. So, instead of  $*V_{\text{trans}}(x)$ , we have  $V_{\text{intrans}}(x)$ , and the thematic roles  $[\theta_1]$  and  $[\theta_2]$  of  $V_{\text{trans}}$  are bundled as in  $V_{\text{intrans}}[\theta_1, \theta_2](x)$  and jointly assigned by  $V_{\text{intrans}}$  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:

- (63) Restriction on (lexical) bundling  
 Bundling is restricted to agent–theme verbs.

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. Thus, 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 first- and second-person pronominals, why doesn’t English? The answer is simply a consequence of the fact that bundling in English eliminates accusative case. If bundling applies, there is no case; therefore, a pronominal such as *me* will not be licensed.<sup>14</sup>

We also find *X washed Xself* because 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*, as bundling leaves a residual case. Because case is an uninterpretable feature, it must be checked and eliminated. This is what *zich* does. So, in Dutch we find *Jan waste zich* as an instance of the bundled entry and *Jan waste zichzelf* as an instance of the unreduced entry, but only *Jan baatte zichzelf*, because *baten* ‘hate’ cannot undergo bundling and concomitant reduction. Because *zich* is inserted to check a residual accusative case, it is not interpreted as a semantic argument; thus, it does not give rise to proxy readings. The claim, then, is that in principle the affixes in affixal reflexives are there simply to license an operation on argument structure. This claim applies to, for example, *-sja* in Russian *myt* ‘wash’ versus *myt’sja* ‘wash<sub>REFL</sub>,’ Khanty *-ij(ɬ)* in *ʈoχətti* ‘wash’ and *ʈoχəttiɬti* ‘wash oneself,’ and *-n-* in Sakha (Vinokurova 2005).

This brings us back to the compositionality of reflexive affixes in example 20, above. 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 two-place predicate and yield a one-place predicate. Although clitics can be inserted as argumental reflexives, as discussed in Section 6.2, they can also be inserted to check a residual case after an operation on argument structure (Marelj & Reuland 2016), like affixes.

<sup>14</sup>Moreover, *I bought me a book* is just fine (see Reuland 2011a, chapter 8, for more discussion).

Reinhart & Siloni's (2005) 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 possible realizations in syntax. These elements are there simply to “smooth” the insertion by taking care of a formal obstacle such as residual case.<sup>15</sup>

## 7. SUMMARY AND CONCLUSION

For the investigation of the anaphoric systems of individual languages, especially those that have been less well studied, the tests shown in **Table 1** are important. The patterns discussed above seem complex, yet they can be accounted for on the basis of the morphosyntactic properties of the “reflexivizing” elements and their syntactic environment, together with the universal principles shown in **Table 2**.

**Table 1** Tests for investigating the anaphoric systems of individual languages

Test	Examples and discussion in the text
Split antecedents	4
Proxy test	14
Object comparison	15
Quantificational antecedent	25
Adverb modification	31
Full-person paradigm	36
Licensing versus enforcing	Sections 6.3 and 6.4
Effect of syntactic position	Section 6.3

**Table 2** Universal principles

Principle	Reference or example in the text
A distinction between binding and coreference	Heim (1982), Reinhart (1983)
A definition of A-binding	27
An Agree-based encoding of interpretive dependencies in syntax (modulo cancellation as an effect of PRD)	41
The effect of IDI on the representation of reflexive predicates, which requires: <ul style="list-style-type: none"> <li>Licensing reflexivity by protection <ul style="list-style-type: none"> <li>Distinguishing between licensing and enforcing of reflexivity</li> <li>Economy, enforcing reflexivization by SELF-anaphors and their kin where possible</li> </ul> </li> <li>Licensing reflexivity by bundling <ul style="list-style-type: none"> <li>A restriction on bundling to agent–theme verbs</li> <li>Variation in the effect of bundling on case assignment by the verb</li> </ul> </li> </ul>	48

<sup>15</sup> It has been claimed that the choice between *zich* and *zichzelf* in languages like Dutch is based on concepts such as *+/-naturally reflexive* or *+/-self-directed* (e.g., König & Siemund 2000). These concepts have no independent definition, though. It remains unclear why *ontwapenen* ‘disarm’ would be naturally reflexive (it must be, as it allows *zich*) or why *bewonderen* ‘admire’ could not be (it cannot be, as 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.

Despite the title of this review, 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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### **Errata**

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