

# Breaking the Coreference Rule

## Reflexivity in Russian Sign Language\*

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### Abstract

This paper is concerned with the distribution of reflexive and non-reflexive pronouns in local anaphoric configurations in (three dialects of) Russian Sign Language (RSL). We demonstrate that most of the observed facts can be accounted for on a Binding Theory supplemented by a version of the Coreference Rule (Büring, 2005). We also show that an additional mechanism, *coreference via the signing space*, is required to explain certain cases of non-complementarity. A related mechanism is proposed to account for similar facts in spoken languages.

## 1 Introduction

Reflexive and non-reflexive pronouns usually appear in complementary distribution, with reflexives in local, especially coargument, anaphoric configurations interpreted as bound variables. This principle, going back to Reinhart (1983), is known as the Coreference Rule (Büring, 2005) and is one of the main achievements of the Binding Theory in general. It is this rule in combination with Principle B of the Binding Theory that accounts for the pattern in (1).

- (1) a. John<sub>i</sub> saw himself<sub>i</sub>. (*himself* is an anaphor and is bound)  
b. John<sub>i</sub> saw him\*<sub>i/j</sub>. (*him* is a pronominal and cannot be bound)

Russian Sign Language (henceforth RSL) seems to break this pattern of complementarity by allowing non-reflexive pronouns to be used in co-argument reflexive contexts.

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- (2) a. IX-A PAINT SEBA<sup>1</sup>  
‘He paints himself’<sup>2</sup>  
b. IX-A PAINT IX-A  
‘He paints himself (lit.: He paints him)’

This fact could be approached in two ways. One is to try and prove that RSL does not in fact differ from spoken languages and the Coreference Rule holds, and the other way is to appeal to the visual modality of this language with ‘modality’ understood as the channel of communication. In many respects sign languages behave like spoken natural languages, but in some respects the channel used by the language can play a role (Sandler & Lillo-Martin 2006: ch. 5). Thus it is very important for linguistic research to test theories against data from sign languages in order to determine which of their properties are indeed universal, and which ones result from the use of a particular channel (auditory or visual).

In this paper we claim that the properties of reflexivity in RSL are mostly predictable by the Binding Theory developed on the basis of spoken languages, but that modality should also be considered as a factor. In particular, we examine the properties of RSL pronouns and compare them with those of some Turkish and English pronouns to reveal both similarities and differences with respect to the Coreference Rule. The theoretical implication is that the Coreference Rule should be considered a part of grammar but that visual modality of sign languages can lessen “the strength” of this rule; a related (but not fully parallel) process explains Coreference Rule obviations in spoken languages.

Another aim of this paper is to present novel data from Russian Sign Language, and to attract attention of researchers working on the Binding Theory in spoken languages to the evidence from sign languages.

In Section 2 we give some information about binding in sign languages. In Section 3 the methodology we used is described. In Section 4 we present the data concerning reflexivity in RSL (and compare it to other languages). In Section 5 we analyse the fact that the Coreference Rule can be broken in RSL, Turkish and English by sketching an economy-based analysis of reference assignment and making crucial use of the notion of the signing space. In Section 6, which concludes the paper, we discuss some implications of our analysis.

## 2 Binding in Sign Languages

Sign languages have been an object of linguistic research since the 1960s (Stokoe, 1960) and it is now very well understood that sign languages are natural languages that share core properties with spoken languages whilst at the same time having some modality-specific characteristics. Sign Languages of the world, especially American Sign Language (ASL), have been actively studied within different frameworks, including generative grammar (Sandler & Lillo-Martin, 2006). In this paper we discuss Russian Sign Language (with references to some other sign languages, as well).

<sup>1</sup>For notational conventions see Appendix A. IX stands for index (a pointing sign).

<sup>2</sup>This example in English has two interpretations: (1) ‘He paints his own portrait/a picture of himself’, or (2) ‘He smears himself with paint.’ The RSL examples here and below only have the first interpretation and only this interpretation is meant in the English translations throughout the paper.

We begin by briefly summarizing the basic properties that sign languages generally have with respect to the realization of anaphoric dependencies, and highlight some of the ‘quirks’ that have been described in the sign language literature on separate idioms.

What makes sign languages different from spoken languages is the use of space to establish anaphoric relations, in other words, the visual modality. This means that a linguistic referent is assigned a locus in the signing space (*R-locus* in the terminology of Lillo-Martin & Klima 1990), and all subsequent mentions of that referent involve referring back to the corresponding locus.

To appreciate that most of the properties of pronouns in sign languages can be explained by the same binding theory that is used for spoken languages, it is convenient to have some semi-formal apparatus that will allow us to single out several classes of anaphoric expressions—anaphors (reflexives and reciprocals), pronominals (regular personal pronouns) and R-expressions (roughly, full noun phrases).

(3) Binding Principles

**Principle A:** An anaphor must be bound in its local domain.

**Principle B:** A pronominal must be free in its local domain.

**Principle C:** An R-expression must be free.

The definition of binding here must involve some notion of coindexing between the pronoun and its antecedent combined with a version of structural command (we will be using *c-command*).

- (4) a. Mary paints herself.  
b. \*Mary’s brother paints herself.

The second sentence in (4) is ungrammatical because there is no *c-command* relationship between the pronoun and its antecedent. Crosslinguistically, the *c-command* requirement on reflexive and reciprocal binding is very strong, sign languages being no exception ((5) illustrates this for Sign Language of the Netherlands).

- (5) a. \*ZELF-A TALK ABOUT IX-A.  
b. IX-A TALK ABOUT ZELF+IX-A.  
‘He talks about himself’ [NGT, Kimmelman (2009: 32)]

Thus, if a sign language is claimed to have a reflexive pronoun, this means that Principle A violations are not possible. This is true for several sign languages discussed below. A more difficult question is whether Principle B violations are allowed.

In the following subsections we discuss the scarce information on different classes of pronouns in different sign languages paying attention to possible Principle B obviations.

## 2.1 American Sign Language, French Sign Language, Israeli Sign Language

The sign language most well-studied in all respects is ASL. It has a reflexive pronoun SELF and non-reflexive pointing signs. Several researchers (Sandler & Lillo-Martin, 2006; Koulidobrova, 2009; Lillo-Martin, 1995) show that Principle B works for ASL, so the reflexive pronoun is in complementary distribution with non-reflexive pronouns:

- (6) MARY IX NOT LIKE CRITICIZE SELF/\*PRONOUN  
 ‘Mary doesn’t want to criticize herself’

In some other contexts the reflexive pronouns and non-reflexive pronouns are interchangeable (7); however Koulidobrova (2009) has shown that the sign SELF in ASL is ambiguous between a true anaphor and an intensifier (similar to English *-self* pronouns). Thus ASL pronoun classes do not present a problem for the Binding Theory.

- (7) LOWEL FEEL SELF/PRONOUN INTELLIGENT  
 ‘Lowel feels himself intelligent’.

For other issues connected to the Binding Theory and ASL see Schlenker (to appear,t); Schlenker & Mathur (2010).

Schlenker (to appear) mentions (without much detail) that in French Sign Language (LSF) there are reflexive and non-reflexive pronouns, and in the relevant domain they are in complementary distribution, so Principle B violations are not attested.

Sandler & Lillo-Martin (2006) also mention that in Israeli Sign Language (ISL) both reflexive and non-reflexive pronouns are present. They do not mention any Principle A or Principle B obviations.

## 2.2 Croatian Sign Language

In their discussion of non-reflexive pronouns in Croatian Sign Language (HZJ), Alibašić Ciciliani & Wilbur (2006) also mention that a reflexive pronoun is present in this language:

In the data discussed here, there was only one HZJ example with “he sees REFLEX in the mirror”, so it is not known if it is obligatory or not. In discussion with participants, some of them said that it is obligatory and some that it is not. This function requires further investigation.

(Alibašić Ciciliani & Wilbur 2006: fn. 1)

This might mean that in HZJ the reflexive pronouns are not in complementary distribution with non-reflexive pronouns, so Principle B might not work in this language. R.B. Wilbur (p.c.) claims that this is indeed the fact for HZJ.

## 2.3 Sign Language of the Netherlands

In Sign Language of the Netherlands (NGT) there is a reflexive pronoun ZELF and non-reflexive pointing signs. The most intriguing fact is that Principle B appears to be easily obviated even on the co-argument domain, as even in this domain the reflexive can be substituted by a non-reflexive pronoun (8).

- (8) a. IX-1 GIRL IX-B ABOUT **ZELF**+**IX-1** A-TELL-B  
 b. IX-1 GIRL IX-B ABOUT **IX-1** A-TELL-B  
 ‘I tell the girl about myself.’
- (9) a. BOY IX-A GIRL IX-B ABOUT **ZELF**+**IX-A** A-TELL-B

- b. BOY IX-A GIRL IX-B ABOUT IX-A A-TELL-B  
'The boy tells the girl about himself.' (Kimmelman 2009: 34)

Examples like (9) are also present in RSL and will be discussed further in this paper.

Thus we conclude that although in some sign languages (ASL, LSF, ISL) the Binding Theory works well, other sign languages (RSL, NGT and probably HZJ) present problems to the theory.

## 3 Methodology

### 3.1 RSL data

First we want to point out what exactly is the subject of this paper: local anaphoric dependencies in mono-clausal sentences in RSL. We analysed only mono-clausal sentences because of time limitations and lack of information on multi-clausal structures in RSL. Moreover, we analysed the properties of reflexive pronouns only in the co-argument domain for the same reason: lack of information on NP structure and adjunction. Another reason for these limitations is the difficulty of obtaining robust grammaticality judgements for complex sentences from RSL signers.

Since reflexive pronouns are analysed according to the Binding Theory, it is necessary to compare them to plain pronouns. We shall not, however, discuss non-local uses of RSL pronouns in any great detail concentrating instead on the distribution of reflexive and non-reflexive pronouns in local anaphoric configurations.

Our main method of obtaining the data was interviewing the informants. It is obvious that properties of reflexive pronouns cannot be studied through corpus research because only a huge corpus of a sign language would contain enough data. Reflexive pronouns and reflexivity in general are not frequently used, especially in sign languages (see the following section).

The participants were asked to read a simple scenario such as (10):

- (10) "I enter the room. My brother is standing there painting. I ask him: what are you painting? He answers: I am painting myself."

Then the signer was asked to retell the situation trying to preserve the meaning but not the form. We also constructed some examples in RSL and asked the signers to judge their acceptability (as signed by one of the authors) and to modify them if they were incorrect. We also asked to explain the meaning of some constructed examples (signed by one of the authors) using other signs and/or structures. All participants were aware of the difference between RSL and Signed Russian and of the probable influence from spoken Russian and were therefore trying to reduce it. However, some of the signers' command of written (and spoken) Russian was not full, so with these signers the influence of Russian would be smaller anyway. Nevertheless influence from Russian in a diachronic perspective, namely via borrowing, cannot be discarded. As we will show later borrowing may also be a factor in the constitution of pronominal system in RSL.

Some of the data obtained during the elicitation sessions has been recorded by a video-camera; but some data has not been recorded because it was obtained through Skype: only the glosses were recorded in the written form. However, the crucial facts that are

discussed in this paper are relatively simple and straightforward, and the signers were comfortable enough making the judgements that we discuss. Judging by the recorded part of the data, there were no intervening factors, such as non-manual marking, that could have influenced the analysis or have been lost during the glossing.

Our RSL informants were nine deaf people from different regions of Russia: five from Omsk, two from Rostov, one from Murmansk, and one from Moscow. We specify the city of their origin because, as we show later in the paper, the systems of reflexives they use can vary considerably and this variation may be connected to dialectal differences. Most of the subjects (8 persons) have deaf relatives and all of them use RSL in their daily life and have acquired it in early childhood. Three of the subjects from Omsk are students at a school for the deaf (final year); one subject from Rostov is a university student and the other persons work. The participants from Omsk live in Omsk, while all other participants live in Moscow.

### 3.2 Turkish data

The Turkish data featuring in the paper also comes from elicitation sessions. As far as our Turkish consultants are concerned, they all came from various social and geographical backgrounds; the group (interviewed separately) included graduate students in various fields and construction engineers. Methodologically speaking, these elicitation sessions involved the same techniques and assignments as we have described above for RSL.

### 3.3 English data

To collect some relevant examples from English that have not been discussed in the literature we had to use consultations of native speakers of English. Most of the data was obtained through e-mail communication. The speakers from various social and geographical backgrounds have been asked to provide grammaticality and semantic judgements of a small number of English sentences.

## 4 Reflexivity in RSL

### 4.1 Personal pronouns in RSL

(Non-reflexive) pronouns in sign languages are described by numerous researchers; a short outline of the research can be found in Chapters 3 and 21 in Sandler & Lillo-Martin (2006).

The general fact about pronouns in sign languages is that they are expressed by pointing. If the referents are physically present at the moment of utterance, the signer points at them to refer to them. If the referents are not present, they are assigned arbitrary loci in signing space.<sup>3</sup> Usually when a noun is used, it is associated with a locus in the signing space immediately after first introduction by a pointing sign, and in subsequent discourse is referred to by pointing to the same location. The signing space is therefore a kind of ‘stage’ or virtual space in which referents are located.

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<sup>3</sup>The arbitrariness is only partial: if there are two referents, one is usually placed to the right and the other one to the left of the signer; if there are three or more, the signing space is separated into the corresponding number of parts and the referents are established in these parts.



Figure 1: The IX-A sign.

- (11) BOY IX-A POSS-1 BROTHER. IX-A STORY TELL.  
 ‘This boy is my brother. He tells a story’.

Figure 1 illustrates the pointing sign IX-A in RSL.

Many sign languages including RSL have possessive pronouns. In RSL it is made with a bent B-hand (see Figure 2 for this hand shape) in non-first person and with a flat B-hand in first person. Possessive pronouns are usually also pointing signs that agree (in palm orientation) with the loci associated with the referent, as in (11) where the hand of the possessive sign is directed towards the signer to express the first person meaning.

A different kind of pronoun which is also non-reflexive in RSL is a sign that we gloss as BOUNDARIES which is done with two B-hands. It is an agreeing sign (see Figure 2 for the 1st and 3rd person version). As we will discuss later, it is used not in all dialects of RSL. It has an additional meaning ‘in detail’ and can be used with a limited number of verbs, such as TELL, SEE and PAINT:

- (12) BOY IX-A PAINT BOUNDARIES-2  
 ‘The boy paints you in detail’
- (13) BOY IX-A TELL ABOUT BOUNDARIES-1  
 ‘The tells about me in detail’

The sign BOUNDARIES is considered to be a pronoun and not an adverb meaning ‘in detail’, because it contains pointing and is interpreted as referring to a nominal referent, as in the examples above.

As we will show later, in some variants of RSL both pointing and BOUNDARIES can be used to express coreference in the co-argument context, which is most problematic for the Binding Theory:

- (14) BOY IX-A PAINT BOUNDARIES-A  
 ‘The boy paints himself in detail’



Figure 2: The BOUNDARIES-1 (2 stills) and BOUNDARIES-A signs.

## 4.2 Reflexive forms of agreeing verbs

Before discussing the reflexive pronouns of RSL we must point out that in some reflexive situations pronouns were not used. There are many cases where spoken language would generally use a reflexive pronoun, while RSL and some other languages do not, the most important case for the present discussion being reflexive forms of agreeing verbs.<sup>4</sup>

All agreeing verbs in RSL have reflexive forms (the same is true for Israeli Sign Language (Meir, 2003), ASL (Sandler & Lillo-Martin, 2006) and Sign language of the Netherlands (Kimmelman, 2009)). RSL, as many other sign languages, has agreeing and non-agreeing verbs. Agreeing verbs can use movement and/or orientation to agree with locations in signing space associated with the arguments of the verb. In the following example the noun *BOY* is followed by a pointing sign which associates it with location A in the signing space; similarly, the *GIRL* is associated with location B. The verb *ASK* has the start point in A and the end point in B.

- (15) BOY IX-A GIRL IX-B A-ASK-B.  
 ‘The boy asks the girl’

The reflexive form of an agreeing verb usually has its starting point and the final point associated with the argument which is reflexivized (in RSL, Sign Language of the Netherlands, Israeli Sign Language and ASL), as is illustrated for the RSL agreeing verb *POUR* in (16) and Figure 3:

- (16) BOY IX-A TEA A-POUR-A.  
 ‘The boy pours tea to himself’

It is important to understand that we do not claim that the verb *POUR* is a reflexive verb; however, the form *A-POUR-A* is reflexive because of agreement: the subject and the object of the verb coincide and this is morphologically reflected in the form of the verb.

In RSL, moreover, a reflexivized form of the verb can be optionally accompanied by the nominal reflexive:

<sup>4</sup>For other cases see Kimmelman (2009).





Figure 3: The POUR-A sign.

- (17) BOY IX-A TEA SEBA A-POUR-A.  
 ‘The boy pours tea to himself’

Moreover, it is possible to use a non-agreeing form (dictionary form) of the agreeing verb with a reflexive pronoun in RSL:

- (18) BOY IX-A TEA SEBA POUR.  
 ‘The boy pours tea to himself’

It has to be noted at this point that neither (17) nor (18), despite closely resembling situations of intensification familiar from a number of languages (see Sæbø 2009 for a recent discussion of the syntax and semantics involved in intensification), is an example of this construction. Put differently, they are not RSL counterparts for English sentences like *The boy himself is pouring tea for himself*. The reflexive forms of agreeing verbs are discussed further in some detail.

### 4.3 Reflexive pronouns in RSL: general information

In this subsection we present basic facts about reflexive pronouns in RSL. As we will show later, even some of these basic facts are subject to variation amongst the signers.

RSL, just like Russian, has a nominal reflexive pronoun and a possessive reflexive pronoun. The nominal reflexive pronoun is (for most signers) a *non-agreeing* sign probably derived from the sign PERSON<sup>5</sup> which coincides in form with this reflexive but is oriented away from the signer and the movement of it is single, while in the reflexive movement is repeated. The nominal reflexive is non-agreeing in the sense that it cannot change orientation or location to agree with referents. In this respect RSL differs from ASL and Israeli Sign Language, where reflexive pronouns change orientation to agree with referents (Sandler & Lillo-Martin 2006: 372).

We gloss the nominal reflexive sign as SEBA (see Figure 4, (20a)). It should be noted that the reflexive pronoun in RSL cannot be used as an intensifier (like English *-self*

<sup>5</sup>This path of grammaticalization “person → reflexive” is attested in some languages of the world, especially in African languages (Huang 2000: 162.)



Figure 4: The SEBA sign (2 stills).

pronouns or SELF in ASL). RSL has a separate sign that functions as the intensifier that can be glossed as SAM following the corresponding Russian word (19).

- (19) a. BOY IX-A PAINT SEBA  
 ‘The boy paints himself (a portrait of himself)’, not ‘The boy himself paints (and not someone else)’  
 b. BOY IX-A SAM PAINT GIRL IX-B  
 ‘The boy himself paints the girl’

SEBA is optionally accompanied by pointing which could be analysed as pointing agreement.<sup>6</sup> The pointing sign can immediately follow the reflexive or be made simultaneously with it (by a non-dominant hand) in non-first person context. In Section 5 we try to prove that this pointing is really an agreement marker rather than an independent pronoun. Of course, this agreement strategy can be used only when the antecedent has previously been established in the signing space; see the contrast between (20b) and (20c). However, even in the case when the referent is established in the signing space, it is not necessary to use pointing alongside the reflexive (20d):

- (20) a. BOY PAINT SEBA.  
 b. \*BOY PAINT SEBA+IX-A.  
 c. BOY IX-A PAINT SEBA+IX-A.  
 d. BOY IX-A PAINT SEBA.  
 ‘The boy paints himself.’

The reflexive pronoun cannot be coreferential with a non-commanding antecedent, in other words, c-command is a necessary condition for binding (21).<sup>7</sup> Moreover, the reflexive pronoun is subject-oriented (22).

<sup>6</sup>Whether this pointing is a clitic, an affix or even a part of the noun phrase is a matter of phonological analysis and is out of consideration here. When pointing is made simultaneously by a non-dominant hand it is more clearly (morphologically) connected to the reflexive.

<sup>7</sup>In actuality there is little information as to the internal composition of the RSL clause; we do, however, take the rigidity of word order (see Kimmelman (2011)) to be indicative of there being some hierarchical asymmetries between clausal elements, and assume linear order to correlate with c-command.



Figure 5: The SVOJ sign (2 stills).

- (21) a. \*SEBA BOY PAINT  
 Intended meaning: ‘The boy paints himself.’  
 b. BOY POSS MOTHER LOVE SEBA  
 ‘The boy<sub>i</sub>’s mother<sub>j</sub> loves herself<sub>j</sub>/\*him<sub>i</sub>.’
- (22) BOY IX-A GIRL IX-B SELF+IX-A/\*IX-B TELL  
 ‘The boy tells the girl about himself/\*herself.’

Observe that the very same ordering of elements within a sentence like (21) would be an acceptable alternative in spoken Russian, provided a correct prosody. This might make us wonder whether this RSL sentence involves an information-structurally motivated movement of the reflexive to the left periphery of the clause. However, this is not the case, as topicalization in RSL must be accompanied by specific marking.

The possessive reflexive pronoun in RSL, which we gloss as SVOJ, is shown on Figure 5. Its origin is unclear.

This sign, too, is non-agreeing (for most signers) in the sense that it cannot change location or orientation to agree with a referent. However, just like SEBA, it is optionally accompanied by pointing (or a plain possessive pronoun), which we analyse as an agreement marker. Again, the pointing sign can immediately follow the reflexive or be made simultaneously with it. Examples below are parallel to those in (20) and show that this agreement strategy is available only when the antecedent has been located in the signing space (23b–c), and that it is optional (23d).

- (23) a. BOY PAINT SVOJ FACE.  
 b. \*BOY PAINT SVOJ+IX-A FACE.  
 c. BOY IX-A PAINT SVOJ+X-A/SVOJ+POSS-A FACE.  
 d. BOY IX-A PAINT SVOJ FACE.  
 ‘The boy paints his own face’

As shown in (24) below, the sign SVOJ must have a c-commanding antecedent. We were not able to elicit an example with arbitrary reference. The possessive reflexive is also subject-oriented (25):

- (24) a. IX-1 LOVE SVOJ BROTHER  
 ‘I love my brother’  
 b. \*SVOJ BROTHER LOVE IX-1  
 Intended meaning: ‘My brother loves me’  
 c. BOY POSS MOTHER LOVE SVOJ SON  
 ‘The boy<sub>i</sub>’s mother<sub>j</sub> loves her<sub>j</sub>/\*his<sub>i</sub> son’
- (25) BOY IX-A GIRL IX-B SVOJ+IX-A/\*IX-B LIFE TELL  
 ‘The boy tells the girl about his own life/\*her own life.’

The sign SVOJ thus behaves very similarly to the Russian possessive reflexive *svoj* and is not problematic for the Binding Theory (at least, no more problematic than the Russian possessive reflexive). Therefore, we do not discuss it further in this paper. For some more discussion see Kimmelman (2009).

Until now the system of RSL reflexive pronouns seems to be very close to the Russian system of reflexive pronouns. RSL as well as Russian have both nominal and possessive reflexives. Both in RSL and Russian reflexives are subject-oriented. In Russian reflexives are non-agreeing in the sense that they lack (some of the)  $\varphi$ -features (the nominal reflexive is non-agreeing in general; the possessive reflexive is not marked for person). In RSL both pronouns are optionally agreeing, but this pointing agreement is in a sense secondary. By secondary we mean that in principle, SEBA could use orientation change and SVOJ could use location change to agree (which they do for some signers), but for most signers an additional sign is used to make them agreeing. Recall that ASL reflexive pronouns are agreeing by orientation (Sandler & Lillo-Martin 2006: 372), which may be connected to the fact that in English reflexive pronouns agree in person with the antecedent.

The fact that the systems are so close suggests that borrowing may have occurred in this grammatical field. This is an important idea to which we will come back shortly. Now we turn to the variation among signers.

## 4.4 Nominal reflexives: different regional variants

In this subsection we present more detailed data on the nominal reflexive SEBA as used by different signers. During our investigation we found out that different signers used nominal reflexives very differently. At first glance it might seem that the diversity of individual systems is so great that there is no general system underlying them all. However, as we show further, there are some core principles underlying all of these systems. The diversity is nevertheless considerable, and at the end of this section we discuss the possible reasons for this diversity.

### 4.4.1 Fully optional reflexive

The first variant of reflexive system is represented by 5 signers from Omsk. Most information was obtained from two of them, but the others when presented with examples as (26) agreed that they are grammatical.

The main feature of this system is that the nominal reflexive is used optionally and can be substituted by the corresponding plain personal pronoun or the sign BOUNDARIES:

- (26) a. BOY IX-A PAINT SEBA



Figure 6: The agreeing sign SEBA-A.

- b. BOY IX-A PAINT IX-A  
 ‘The boy paints himself’

- (27) BOY IX-A PAINT BOUNDARIES-A  
 ‘The boy paints himself in detail’

In this system reflexivized forms of agreeing verbs can easily be used without the reflexive anaphor (recall example (16) repeated here as (28)).

- (28) BOY IX-A TEA A-POUR-A.  
 ‘The boy pours tea to himself’

#### 4.4.2 Partially optional reflexive

The system described in §4.4.1 does not work for the rest of the signers we consulted with. For them, it is impossible to use a plain pronoun instead of the nominal reflexive. However, for three of them (except for the one from Murmansk) the sign BOUNDARIES is grammatical in the reflexive context (27).

As for the status of examples like (28) above, in this system agreeing verbs in reflexive forms can easily be used with or without the reflexive, too.

#### 4.4.3 Obligatory agreeing reflexive

One person (from Murmansk) showed a very different system. In her variety of RSL the nominal reflexive is an agreeing sign: it changes orientation to agree with the referent’s location: Figure 6 and (29).

- (29) BOY IX-A PAINT SEBA-A  
 ‘The boy paints himself’

The same signer also considered the non-agreeing sign SEBA grammatical but preferred the agreeing form. She pointed out that she did not use the sign BOUNDARIES at all, either in pronominal, or in reflexive contexts. She claimed to never use plain pronouns

instead of the reflexive. For her even the reflexive form of an agreement verb was almost ungrammatical without the reflexive:

- (30) ??BOY IX-A TEA A-POUR-A.  
'The boy pours tea to himself'

#### 4.4.4 Other reflexives

In the course of our inquiry we also found out that in all systems there is a pronominal sign SEBA2 identical in form to the sign SEBA which can be used in a non-reflexive context to express the Receptient of the verbs of transmission:

- (31) COAT NEED-NOT. GIVE SEBA2-A  
'I do not need this coat. I will give it to you, for your own use.'

There are also some expressions present in the systems of some signers which are either borrowed from Russian or idiomatic and which contain the sign SEBA. These topics are not directly relevant for the discussion in this paper, so we refer the interested reader to Kimmelman (2009).

#### 4.4.5 Different systems: summary

To sum up, the first group of signers from Omsk uses the nominal reflexive SEBA optionally: it can be substituted by the BOUNDARIES sign or even by personal pronouns, and omitted in the context of a verb with reflexive agreement.

For the second group of signers from Rostov and Moscow the use of the nominal reflexive is mostly obligatory, but the reflexive can be substituted by the BOUNDARIES sign or omitted in the context of a verb with reflexive agreement.

The last group consisting of only one person from Murmansk obligatorily uses the agreeing version of the reflexive SEBA in all reflexive contexts.

Thus, the systems of different signers are very different. How could this happen? There are two possible explanations:

1. Regional variation.

The signers from Omsk behave one way, the signers from Moscow and Rostov (they are rather close to each other, approx. 200 kilometres) behave in another way; the signer from Murmansk has yet a different system. Unfortunately, we were not able to test this hypothesis, and there is no data on dialects of RSL in Russia yet.

2. Borrowing an unstable system.

As we have already shown, basic properties of the system of reflexive pronouns are borrowed from Russian. One of the signers even claimed that only the sign SEBA2 (which is not a reflexive) is a part of RSL grammar, while the sign SEBA is from Signed Russian. In other words, the Russian system of reflexive pronoun has been borrowed into RSL and somehow adjusted to the RSL modality (optional agreement etc.). At the same time, the borrowing process was not full and RSL has not borrowed the Russian system as a whole. Therefore, the system which we now observe in (different varieties of) RSL is not stable and the vast variation we

find may be explained by the fact that this system is alien, foreign to RSL and not fully integrated yet. Of course, because of the lack of historical data, this is just a hypothesis.

Needless to say, neither hypothesis contradicts the other, and both may well be true.

## 4.5 Optionality of reflexive pronouns

As we have shown, some of the systems of reflexive pronouns of RSL show unusual properties. The least problematic system is the system with the obligatory agreeing reflexive, where the reflexive pronoun cannot be substituted by non-reflexive pronouns in the co-argument context. However, in the other two systems pointing or BOUNDARIES can be used instead of the reflexive sign SEBA, which is unexpected.

The question to ask at this point is whether this situation is unique for Russian Sign Language (or for sign languages in general). There is crosslinguistic evidence to suggest that this question should be answered in the negative. For example, Turkish has three types of pronouns: a pronominal *o* (32a), a simplex reflexive *kendi* (32b) and an inflected form of the reflexive, *kendisi* (32c), which can be used both pronominally and reflexively:

- (32) a. Ali       onu               gördü.  
 Ali.NOM he/she/it-ACC see-PAST  
 ‘Ali saw him/\*himself’
- b. Ali       kendini   gördü.  
 Ali.NOM self-ACC see-PAST  
 ‘Ali saw himself/\*him’
- c. Ali       kendisini   gördü.  
 Ali.NOM self-3SG-ACC see-PAST  
 ‘Ali saw himself/him’
- [Enç (1989): 58]

Similar behaviour has been reported of two other pronouns, *dirinya* ‘self.3SG’ in Singapore Malay (Cole & Hermon, 2005) and *wuĐ* ‘self’ in Tsakhur (Lyutikova, 2000).

However, the RSL and Turkish patterns are not wholly parallel. In the following section we discuss in more detail the properties of reflexive and non-reflexive pronouns in RSL (and Turkish) to show this.

There is another class of cases that in many respects bear a striking resemblance to RSL data—the syntactico-semantic properties of indexical pronouns in (some) spoken languages. Enç (1983) has shown that in English first person pronouns can obviate Principle B with a considerably greater ease than plain 3rd person pronouns:

- (33) a. I believe in me.  
 b. I think of me as a creative soul.  
 c. I want me to win.  
 d. I expect me to be finished by then.  
 e. I’m proud of me.  
 f. I got me a puppy for my birthday.  
 g. I bought me a new coat.

These sentences appear to present clear violations of Condition B, and yet they are judged (marginally) acceptable.<sup>8</sup>

Moreover, in Turkish first and second person pronouns can violate Principle B, according to Enç (1983):

- (34) a. Ben beni akıllı sanıyordum.  
 I I-ACC smart thought  
 ‘I considered myself smart’  
 b. Sen seni akıllı sanıyordun.  
 you you.ACC smart thought  
 ‘You considered yourself smart’ (Enç 1983: 80)

The parallel between first and second person pronouns in spoken languages and pointing signs in sign languages is obvious: both types of pronouns are indexicals. Thus a common explanation of these facts is anticipated.

## 4.6 Semantic and syntactic binding

### 4.6.1 Coreference vs. semantic binding

As several researchers claim, binding principles should be formulated in semantic, not syntactic terms (Reinhart, 1983; Reinhart & Reuland, 1993; Kiparsky, 2002; Büring, 2005). The main claims are as follows:

1. Principle B should be formulated with reference to semantic, not syntactic binding: Pronominals must not be semantically bound in their local domain
2. The fact that pronominals cannot be used to express coreference (without semantic binding) in the local domain is captured by the Coreference Rule:

"The Coreference Rule

$\alpha$  cannot corefer with  $\beta$  if an indistinguishable interpretation can be generated by replacing  $\alpha$  with a variable bound by  $\beta$ .

(Büring 2005: 119)"

These principles account for the following facts of English:

- (35) a. John<sub>i</sub> paints himself<sub>i</sub>.  
 b. John<sub>i</sub> paints him<sub>j</sub>/\*<sub>i</sub>.

The impossibility of *him* referring to *John* is explained in two steps. First, Principle B states that *him* cannot be bound by *John* as it is a pronominal (–anaphoric). Second, *him* cannot be coreferent with *John* (without binding) because variable binding would be semantically indistinguishable from coreference.

However, pronominals can express coreference even in the local domain, if coreference can be semantically distinguished from binding:

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<sup>8</sup>By speakers of American, British, and Canadian English.



(36) Everybody hates Max. John hates him. Bill hates him... Even  $Max_i$  hates  $him_i$ .

In this example *him* is coreferent with *Max* but not semantically bound by it. This is explained by the fact that the discourse contains a list of relations of the form ‘*x* hates Max’; *even* in the last sentence is used to emphasize that the relation ‘*x* hates Max’ holds of Max himself. If the last sentence contained a bound variable (“Max hates himself”), this effect would not hold. Therefore, in this discourse there is a difference between coreference and the bound-variable reading. Thus the Coreference Rule does not rule out coreference in this example.

Let us consider semantic binding in RSL. The question we shall be asking is whether reflexive and non-reflexive pronouns can be semantically bound in the co-argument context.

#### 4.6.2 Semantic binding in RSL, Turkish and English

There are three well-known tests to distinguish semantic binding from coreference: focusing with particles like *only*, VP-ellipsis and quantificational binding.<sup>9</sup>

In sentences containing *only*, semantic binding and coreference give different semantic results:

- (37) Only  $John_i$  loves himself<sub>*i*</sub>.  
 = ‘John loves John, and nobody else loves him/herself.’  
 = \*‘John loves John, and nobody else loves John.’
- (38) Only  $John_i$  loves his<sub>*i*</sub> wife.  
 = ‘John loves John’s wife, and nobody else loves John’s wife.’  
 = ‘John loves John’s wife, and nobody else loves his own wife.’

*Himself* can be only interpreted as a bound variable, so the second interpretation is not available. *His* can either be bound by *John* or coreferent with it, so both interpretations are available.

Unfortunately, this test does not work for RSL because of the difficulties in obtaining robust grammaticality judgements in these contexts. Maybe in future it will be possible to find signers that would be ready to distinguish the two possible interpretations and judge whether they are appropriate with reflexive and non-reflexive pronouns.

Another well-known test is the VP-ellipsis test:

- (39)  $John_i$  loves his<sub>*i*</sub> wife, and so does Bill.  
 = ‘John loves John’s wife, and Bill loves John’s wife.’ – coreference.  
 = ‘John loves John’s wife, and Bill loves Bill’s wife’. – binding.
- (40)  $John_i$  loves himself<sub>*i*</sub>, and so does Bill.  
 = ‘John loves John and Bill loves Bill.’ – binding.  
 = \*‘John loves John and Bill loves John.’ – coreference.

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<sup>9</sup>Schlenker (2005) has shown that the tests mentioned here do not give results as straightforward as presented below. For the simplicity of presentation (and due to the fact that the only test we used with RSL is the quantifier binding test, which is the least problematic) we avoid this discussion here.

This test does not work for RSL either. Although RSL in general permits ellipsis of a lot of different material, including arguments, omission is not possible if there is some ambiguity created by it. Therefore, in the test sentences the VP in question will be overtly expressed, so the test will not give any results:

- (41) a. IX-1 SEBA PAINT, POSS-1 BROTHER TOO SEBA PAINT  
 ‘I paint myself and my brother paints himself, too.’  
 b. IX-1 SEBA PAINT, POSS-1 BROTHER TOO IX-1 PAINT  
 ‘I paint myself and my brother paints me, too.’  
 c. \*IX-1 SEBA PAINT, POSS-1 BROTHER TOO

Fortunately, the third test, namely, quantifier binding, worked for RSL. This test is pretty straightforward: if a pronoun is bound by a quantifier, then it is trivially semantically bound (there is no sense in which a pronoun can be coreferent with a quantified noun phrase):<sup>10</sup>

- (42) a. Every boy<sub>i</sub> paints himself<sub>i</sub>.  
 b. Every boy<sub>i</sub> paints him<sub>j/\*i</sub>

The general conclusion that comes from the quantifier binding test applied to RSL is the following: only true reflexives can be bound by a quantifier in the co-argument context.

Recall the Omsk RSL system where reflexives are fully optional. Below are the results of the quantifier binding test for this system: the nominal reflexive SEBA (no matter whether it is accompanied by agreement pointing (43b–c) or not (43a)) can be bound by a quantifier in subject position, while pointing (plain pronouns) (44) and the sign BOUNDARIES (45) cannot be bound by a quantifier in that position:

- (43) a. BOY EACH-PL PAINT SEBA.  
 b. BOY EACH-PL PAINT SEBA+IX-A IX-B IX-C.  
 c. BOY EACH-PL PAINT SEBA+IX-PL.  
 ‘Each boy paints himself’
- (44) a. BOY EACH-PL PAINT IX-A IX-B IX-C.  
 b. BOY EACH-PL PAINT IX-PL.  
 ‘Each boy paints all other boys’, *not* ‘Each boy paints himself’  
 c. BOY EACH-PL PAINT IX-A.  
 ‘Each boy paints him (one particular boy)’
- (45) a. BOY EACH-PL PAINT BOUNDARIES-PL.  
 Only ‘Each boy paints all other boys in detail’, *not* ‘Each boy paints himself in detail’  
 b. BOY EACH-PL PAINT BOUNDARIES-A.  
 ‘Each boy paints him (one particular boy) in detail’

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<sup>10</sup>A potential objection to be discussed at this point concerns whether one should, or even could, draw any serious conclusions about the variable binding/coreference patterns observed in RSL based on the results of one single test. In our opinion, the crucial difference between ellipsis and *only*-tests on the one hand and quantifier binding on the other lies in the fact that the former two tests are designed to reveal the optional/mandatory character of bound variable interpretations, whereas the latter test highlights the *availability* of such interpretations, which makes it perfectly suitable for our purposes.

In the Moscow and Rostov systems of RSL where the nominal reflexive can be substituted by the BOUNDARIES sign, the former but not the latter can be bound by a quantifier (examples above are relevant for this system, too).

Interestingly, in the Murmansk system, where the agreeing form of the nominal reflexive is the basic one and this nominal reflexive is a true reflexive, the quantifier binding test confirms this result—this agreeing reflexive can be bound:

- (46) ALL TEA POUR SEBA-A SEBA-B SEBA-C  
 ‘Everybody pours tea to themselves’

This case is very important because it shows that the possibility of the bound-variable reading is not connected to agreement properties and spatial mechanisms: both the true reflexive SEBA in the Murmansk dialect and the sign BOUNDARIES in other dialects are agreeing; still, only the true reflexive can be bound by a quantifier. Thus, reflexivity does not depend on the spatial agreement of the pronoun.

One of the unexpected facts is that reflexive forms of agreeing verbs not accompanied by a reflexive pronoun cannot be bound by a quantifier in RSL:

- (47) [Context: A family are sitting around the table. They are going to drink some tea.]  
 a. EACH TEA SEBA A-POUR-A B-POUR-B C-POUR-C  
 b. EACH TEA SEBA POUR-PL  
 ‘Everybody pours tea for themselves.’  
 c. \*EACH TEA A-POUR-A B-POUR-B C-POUR-C  
 d. \*EACH TEA POUR-PL

This means that these reflexive forms of agreeing verbs are *not really reflexive* inflection. Compare this situation to Russian, where the reflexive form of the verb can only receive the bound-variable reading:

- (48) Ja moju-s’, Pet’a tože.  
 I bathe-REFL Pet’a too  
 ‘I bathe myself, Pet’a also bathes himself’, not ‘I bathe myself, Pet’a also bathes me’.

In fact, with respect to binding, verbal locus agreement has the same status as pointing: it can be used to express coreference, but not the bound-variable reading. It would thus be more appropriate to call these forms coreferential agreement, not reflexive agreement. We will discuss this more in the next section.

To sum up, we have shown that true reflexive pronouns can be interpreted as bound variables in the co-argument context, while non-reflexive signs can only express coreference, therefore, they are pronominals and specified as [–anaphoric]. A similar situation is attested in Turkish, where the true reflexive *kendi* must be a bound variable in the co-argument context, while *kendisi*, which can be used non-reflexively, can only express coreference in this context:<sup>11</sup>

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<sup>11</sup>In fact, Rudnev (to appear) argues, giving evidence from semantic binding, *donkey*-anaphora, re-sumption, availability of *de re* readings in intensional contexts, that *kendisi* is a *bona fide* pronominal, exactly like *he* in English.

- (49) a. Herkes kendin-e gördü.  
 Everyone.NOM self-DAT see-PAST  
 ‘Everyone saw themselves’  
 b. Herkes kendi-sin-e gördü.  
 Everyone.NOM self-3SG-DAT see-PAST  
 ‘\*Everyone saw himself.’  
 ‘✓Everyone saw him/her/it.’

If we look at first person pronouns in English that can obviate Principle B when in co-argument contexts, we can see that they too are used only to express coreference, while semantic binding is not possible, as the examples below demonstrate. Whilst the ungrammaticality of (50) can be attributed to the person mismatch, the other two examples clearly show that the first person pronoun coreferent with the subject of the same predicate is not bound by it.<sup>12</sup>

- (50) \*Everyone<sub>i</sub> saw me<sub>i</sub>.  
 (51) I bought me a new coat, and you did too.  
 = Both I and you have the property  $\lambda x.x$  bought *me* a new coat  
 ≠ Both I and you have the property  $\lambda x.x$  bought *x* a new coat  
 (52) Only I bought me a new coat.  
 = I am the only individual with the property  $\lambda x.x$  bought *me* a new coat  
 ≠ I am the only individual with the property  $\lambda x.x$  bought *x* a new coat

This data from RSL, Turkish and English presents a problem for the Binding Theory discussed above—because coreference can be expressed in the co-argument context without implying semantic binding, the Coreference Rule seems to be broken. In the next subsection we discuss this issue.

## 5 Analysis

There are at least two possible explanations of the fact discussed in the previous section. Firstly, one might consider the lack of ambiguity as the main mechanism underlying Principle B obviation. This analysis is discussed in §5.1 below. However, this analysis has several drawbacks that are also discussed in §5.1. Secondly, one can consider different levels of reference as the main mechanism. This option is discussed in §5.2.

### 5.1 Lack of ambiguity

There is an obvious explanation of the fact that pointing in RSL and 1st and 2nd person pronouns in English and Turkish can be used to express coreference in any syntactic context including the coargument context, namely lack of ambiguity. As we have seen,

<sup>12</sup>It has to be noted that we are not claiming that indexical pronouns cannot be bound—they can, but at longer distances, which places them outside the scope of this paper. See Heim (2008); Kratzer (2009) for the data and discussion.

pointing in sign languages unambiguously identifies the referent. Thus coreference is established very efficiently and overtly. This also holds for first and second person pronouns in spoken languages, as they are also unambiguous in their reference.

This (or a similar) explanation was proposed for the fact from spoken languages by Enç (1983). She claimed that first and second person pronouns can be characterized by a [+anchored] feature which means that their reference is fixed by the context. This allows them to obviate Principle B and be coreferent with a co-argument c-commanding antecedent. As far as we can tell from Enç's discussion of this [+anchored] feature, it allows the pronouns to obviate Principle B because of the lack of ambiguity. Enç (1983) has also claimed that *kendisi* in Turkish is an instance of third person pronoun specified as [+anchored].

This explanation, however, has several flaws. We now discuss these problems one by one, which will lead us to the conclusion that this explanation should be abandoned.

Firstly, the lack of ambiguity in sign language pointing is not full. For instance, there is always an ambiguity between a referent located at some location and that location itself, as in (53).

- (53) BOY POSS HOUSE IX-A. IX-A BIG  
'Here is the boy's house. It/he is big'.

In (53) the noun BOY and the location HOUSE are connected to one locus, A, in the signing space. Thus pointing to this locus can be ambiguous. However, this objection is not very serious, as the amount of ambiguity in pronouns in spoken languages is still obviously much greater than the amount of ambiguity in sign languages.

Secondly, if we claim that pointing is such an efficient way of expressing coreference, then we have no explanation for the fact that reflexive pronouns are still used and often preferred to non-reflexive pronouns in many sign languages. Moreover, in Turkish and English in first and second person cases where coreference can be established via indexical pronouns, reflexive pronouns still can be used (and even preferred, too).

Thirdly, ambiguity in general is not a mechanism used in the formal binding theory (Büring, 2005). If we introduce this (functional) notion in a formal theory, we will be making a very serious theoretical claim. Thus it would be more welcome to avoid making this analytical move. Of course, this problem is purely theoretical in nature and by itself should not be decisive.

Fourthly, and most importantly, the lack of ambiguity theory has nothing to say about the observed facts concerning semantic binding and coreference. Why can non-reflexive pronouns express coreference but not binding in the co-argument context? Ambiguity seems to be irrelevant here. Thus we need a different explanation to account for the crucial facts of semantic binding and coreference differences observed in both signed and spoken languages.

## 5.2 The Signing Space explanation

### 5.2.1 The Coreference Rule at work

Let us return to the crucial notion of the Coreference Rule. The main problem we are trying to fix is that the Coreference Rule seems to be broken in RSL, Turkish and (for

1st person pronouns) in English. If we recall Büring’s formulation of the Coreference Rule, it states that semantic binding is preferred over coreference only if they yield indistinguishable interpretations. In the example from English repeated here coreference can be expressed by using a pronominal in the co-argument context, because semantic binding would yield a different interpretation:

(54) Everybody hates Max. John hates him. Bill hates him. . . Even  $Max_i$  hates  $him_i$ .

But what are distinguishable interpretations? We adopt the formulation in Heim (1993), whereby whenever a particular property  $P$  is under discussion, and LF and LF’ are logical forms such that  $P$  is denoted by some part of LF but not by any part of LF’, then LF should be distinguished from LF’, even if both express the same proposition. Keeping this in mind, we can explain some of the facts in the previous section.

First, the sign BOUNDARIES can be used to express coreference in the co-argument context because it has an additional lexical semantics, so using SEBA would certainly not give an indistinguishable sentence (in fact, (55a,b) do not even express the same proposition).

- (55) a. IX-1 PAINT SEBA  
       ‘I paint myself’  
       b. IX-1 PAINT BOUNDARIES-1  
       ‘I paint myself *in detail*’

Second, we can also approach the Turkish data. In Turkish, the difference between *kendi* (anaphor) and *kendisi* (pronominal) is much more subtle, and thus more difficult to formulate: for those speakers who find *kendisi* acceptable with a coargument (referential) antecedent, a relatively lengthy period of time must have elapsed between the referent in the reported event and the same referent in some other event before. Using *kendi* in this context is possible without this temporal requirement.

- (56) a. Ali        kendini gördü.  
       Ali.NOM self-ACC see-PAST  
       ‘Ali saw himself’ (no time specification, for example, Ali saw himself in the mirror)  
       b. Ali        kendisini gördü.  
       Ali.NOM self-3SG-ACC see-PAST  
       ‘Ali saw himself’ (for example, Ali saw himself as he was twenty years ago)

Intuitively this temporal restriction is connected to the coreference vs. binding distinction: a situation involving semantic binding is understood as involving one participant only, while in the case of coreference the subject happens to have the same referent as the object, and therefore the subject and the object can be temporally distanced.<sup>13</sup>

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<sup>13</sup>We should mention, however, that the Turkish data are only tentative: it is rather difficult to obtain confident judgements concerning such delicate semantic differences, nor is it easy to find uniformity in those judgements—some informants display no hesitation in allowing bound-variable readings of *kendisi* with a coargument antecedent. If *kendisi* can indeed be bound in the coargument context, then it is a case of Principle B obviation (and not a case of the Coreference Rule obviation) and is therefore beyond the scope of this paper. For alternative analyses of reflexivity in Turkish, see Enç (1989); Kornfilt (2001).

However, there is no way to explain in the same terms the fully optional reflexive system of RSL, where pointing can be used to express coreference in the co-argument context. Pointing does not have any additional lexical semantics, so it seems that coreference and semantic binding are indistinguishable in this context: we did not create a special context as in (54). We need to emphasize this crucial fact once more: we have not found any semantic differences (parallel to those observed in Turkish) between examples with the nominal reflexive pronoun and examples with pointing used to express coreference. The same can be said about first person pronouns in English: there is no semantic difference between *I bought me a new coat* and *I bought myself a new coat*. Therefore, the explanation traditionally applicable to the Coreference Rule obviation is not available for these examples.

### 5.2.2 Different levels of reference

Let us take a step back and find out what motivation lies behind the Coreference Rule. To quote Reinhart (1995),

The economy rationale behind this strategy, is that variable binding is a more economical means to identify referential identity of two expressions. Actual assignment of reference, at the interface, requires relating an expression to the set of entities in the discourse (model, domain or whatever). This is a rather complex procedure, although it falls outside of the computational system. In the case of variable binding,  $\langle \dots \rangle$ , this procedure has to apply once, identifying the value of one of the arguments. In all other cases, it has to apply to each argument. E.g. in *He touched Max*, it has to apply both to *he* and to *Max*. If what is intended is the referential identity of these arguments, applying the same procedure twice, when we could have done it only once, is uneconomical. (Reinhart 1995: 16)

Thus the procedure of assigning reference is considered to be less economical than linguistically referring back to another linguistic entity with an anaphor.

Consider Figure 7, which schematically represents the procedure of assigning reference in spoken and sign languages. In the left part of the figure the spoken languages' procedure is represented. There are basically two levels concerned here: the real world and the discourse. The procedure of assigning reference connects a linguistic expression, *the boy*, on the discourse level to an entity in the real world (empty arrow). The procedure of variable binding connects two linguistic expressions, *the boy* and *himself*, on the discourse level only, and this is less costly.<sup>14</sup>

However, in sign languages (righthand side of Figure 7) there are at least three levels: the real world, the discourse, and the signing space. When some entity is mentioned for the first time, like BOY IX-A, a connection can be made between all three levels: this entity is (optionally) associated with a locus in the signing space (empty arrow) and is mentioned by uttering some sign (discourse level, dashed line). If the noun is not assigned a locus, then reference proceeds as in spoken languages (pictured at the scheme). When

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<sup>14</sup>Of course, this is not the model of reference in general: it only touches upon the parts of reference procedure relevant for this discussion. Besides, we disregard the fact that the antecedent itself is not the binder (Büring, 2005).

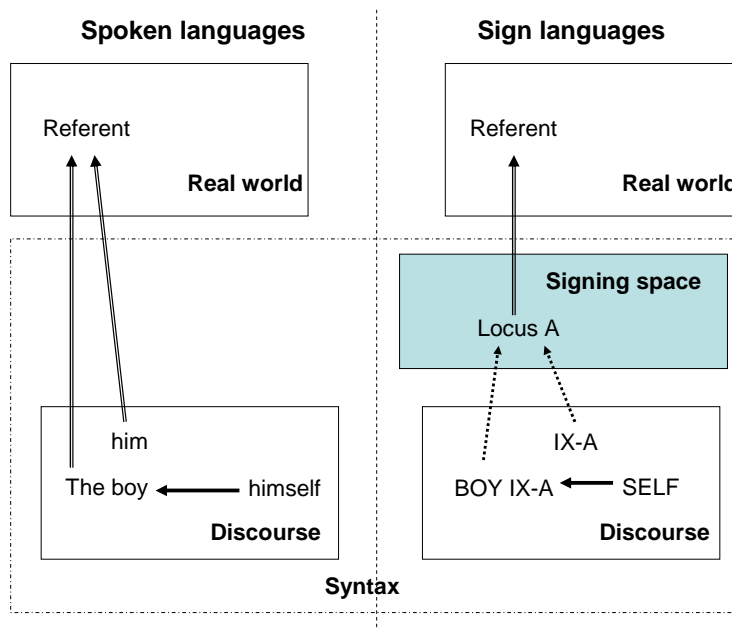


Figure 7: Levels of reference in spoken and sign languages (to be revised).

the signer refers back to this entity with a pointing sign (IX-A), there need not be direct association between the discourse level and the real world: the only association that is there is the association between the pointing sign (IX-A) and the location in the signing space. Of course, there is also the possibility of using a reflexive pronoun as in spoken languages.

Our hypothesis is the following:

- (57) The operation of association between an expression on the discourse level and a location in signing space is less costly than direct association between an expression on the discourse level and an entity in the real world. Most likely, this association is a part of the computational system (syntax).

From our point of view, this hypothesis is an approximation to the explanation of the fact that the Coreference Rule is not strictly obeyed in sign languages. If the operation of connecting the discourse level and the signing space level is less costly than the operation directly connecting the real world and the discourse level, it may explain why applying this operation instead of the operation of variable binding does not lead to ungrammaticality in sign languages.

This idea is not as radical as it may seem. In fact, the idea that indexes are overtly expressed in sign languages is proposed by Lillo-Martin & Klima (1990). They write that "... an R-locus in ASL is part of the vocabulary of form". This may be interpreted as the claim that loci are part of syntactic representations of sign languages; they are syntactic instantiations of semantic indexes. Lillo-Martin & Klima (1990) obviously did not discuss Principle B (or Coreference Rule) obviations as they are not attested in ASL, but their



analysis of ASL pointing is compatible with the facts of RSL.

Moreover, using this idea we can explain the behaviour of indexical pronouns in spoken languages in the exact same way. We do not need to use the notion of the signing space, which is trivially absent in spoken languages, but we just need to claim that indexes are present in syntax just in the case of indexical pronouns in spoken languages. Coindexing in syntax is not as costly as coreference, and thus the apparent Coreference Rule obviations are explained. Figure 8 summarizes the parallels between pointing in sign languages and indexical pronouns in spoken languages.

So, in spoken languages as in sign languages there is an additional mechanism of expressing coreference (except for coreference through real world and binding): coindexation in syntax. When a first-person pronoun (I) is used in English, it is assigned an index on the syntactic level, and this index is associated with the referent in the real world. Thus when another first-person pronoun (me) is used, the coreference between *I* and *me* can be established without the second act of reference assignment through this syntactic coindexation mechanism, and this mechanism is therefore less costly.

Finally, we should elaborate the hypothesis a little further. Syntactic indexes in general are indispensable for the Binding Theory. Therefore, the process of coindexation in syntax that is not identical to coreference should be somehow limited in order not to predict grammaticality of all sentences with obviations of the Coreference Rule. Our hypothesis is as follows: coindexation can proceed in syntax *only if syntactic indexes have overt/morphological realizations*. So for sign languages loci in the signing space are overt realizations of indexes, while for spoken languages first and second person pronouns are overt realizations of indexes, too.

In our current system, therefore, there are three mechanisms of coreference: coreference itself (via the real world level), coindexation in syntax, and semantic binding. The original Coreference Rule predicts that semantic binding should always be preferred to coreference. We have seen that coindexation in syntax is acceptable even when semantic binding is possible. Whether coindexation in syntax results in examples that are acceptable but dispreferred when they compete with examples with semantic binding is an open question. Further research should show the exact relation between these two mechanisms.

### 5.2.3 The problem of optionality

The explanation we propose has an obvious problem. The signing space is utilized not only in RSL and NGT, but also in ASL and French Sign Language. If our analysis were true, we would expect to find Coreference Rule obviations in these languages as well. However, this problem also exists for spoken languages. In Turkish both first and second person pronouns can obviate the Coreference Rule, in English only first person pronouns, while in Russian (according to our intuitions) neither first nor second person pronouns can do so.

We have to conclude that the only thing we can propose at this stage is the hypothesis that languages vary with respect to which kinds of anaphora they consider costly. Thus RSL considers anaphora through signing space less costly than coreference, while ASL does not. Also, English considers coindexation in syntax less costly than coreference in general, while Russian does not.

One should also notice that any other explanation of the facts that we discussed will

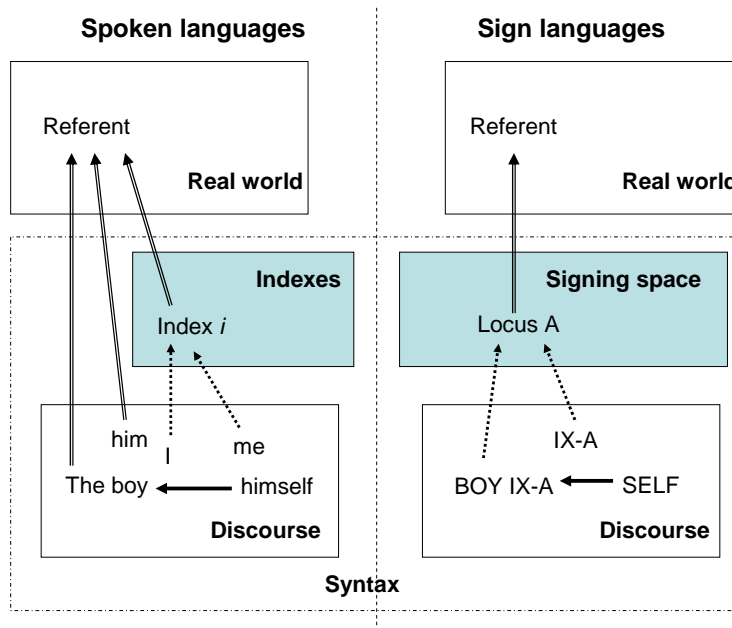


Figure 8: Levels of reference in spoken and sign languages (final).

face the same problem of optionality. For instance, the lack of ambiguity theory would also predict that all sign languages should behave identically with respect to Principle B obviation.

## 6 Predictions and outlook

In this paper we presented the facts of the pronominal system of Russian Sign Language (RSL). We have shown that RSL has both pronominals and anaphors, and that the latter but not the former give rise to bound variable readings in the co-argument context effectively ruling out local coreference. In certain varieties of RSL local coreference can nevertheless be expressed by pronominals, too, and often without apparent changes in interpretation. We claimed that in most cases this can still be explained in the traditional terms of the Binding Theory, namely by a version of the Coreference Rule. We then proposed an additional element in the reference assignment system, *the signing space*, which we took to be instrumental in explaining Principle B obviation, and drawing on striking similarities between RSL non-reflexive pronouns and personal pronouns in spoken languages, extended the proposal to account for these similarities as well.

On a more general note, we have been trying to emphasize the importance of studying the properties of reflexive pronouns in Russian Sign Language, and generally across sign languages, which so far seem to have drawn far less attention in the literature than demonstrative pronouns and pointing signs in these languages. It is therefore vital to discuss the behaviour of both classes of pronouns in combination in order to gain more insight into their distribution.

The most important conclusion for the Binding Theory is that sign languages obey it relatively well. This conclusion can also be made on the basis on Philippe Schlenker’s recent works in this field: Schlenker (to appear), Schlenker (to appearb), Schlenker & Mathur (2010).

Our analysis has also shown that the so-called reflexive forms of agreeing verbs in RSL should not be called reflexive: they are in fact coreferential. This shows that agreement on verbs behaves like pronouns and not like agreement markers in this respect—a fact that is also confirmed by Schlenker & Mathur (2010), who show that Weak Crossover effects that are present in sign languages can be obviated when a resumptive pronoun *or an agreeing verb* is present <sup>15</sup>.

On the other hand, pointing that optionally accompanies reflexive pronouns in RSL is not visible for the binding principles: it does not affect the reflexive’s ‘bindability’ in any way. It is also important to notice that spatial agreement in general is not directly connected to the possibility to be bound: a true reflexive SEBA in the Murmansk variant can be bound by a quantifier, although it is an agreeing sign.

All these facts come into attention only when the difference between coreference and semantic binding is acknowledged.

Our theory predicts that if a noun is assigned a default locus (Schlenker, to appear), Coreference Rule obviations should not be possible, as several nouns can be assigned the same default locus and it would be not possible to establish coreference without appealing to the real world level. Moreover, a default locus is not a morphological realization of syntactic indexes, as different nouns having different syntactic indexes can be placed in the default locus (so there is no one-to-one mapping between syntactic indexes and loci in this case). Whether our prediction is correct should be checked in future work.

Finally, it has been brought to our attention that our proposal might be making an empirically inadequate prediction about the status of examples like (58), where one referent is associated with multiple spatiotemporal locations.

- (58) JOHN IX-b<sub>a</sub>[WORK FRENCH CITY] SAME<sub>b</sub>[WORK AMERICAN CITY]. IX-a IX-1  
 HELP IX-b, IX-c IX-1 NOT HELP IX-b.  
 ‘John does business in a French city and he does business in an American city.  
 There [= in the French city] I help him. There [= in the American city] I don’t  
 help him.’

Suppose this example could be modified in such a way as to give rise to a potentially reflexive interpretation (possibly by replacing *help* with *like* and *I* with *John*)—that way, the referent of the antecedent is assigned two distinct loci in the signing space. Recall that one of the main characteristics of our additional mechanism of establishing coreference is the direct association between the pointing sign and the locus in the signing space. Importantly, this need not mean that there must be a *single* locus for every referent. In fact, once we assume that antecedents can come in “guises” representing distinct spatio-temporal slices, as per Heim’s (1993) suggestion, such hypothetical examples would not contradict our proposal because then they would fall squarely into the purview of the Coreference Rule. Whether such sentences are acceptable, and if they are, what mechanism they are licensed by, is a matter of future research.

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<sup>15</sup>P. Schlenker (p.c.) mentions that the generalization concerning Weak Crossover effects is provisional.

## A Notational conventions

Small caps are used to gloss signs of sign languages. The words are approximate translations of the corresponding signs. IX stands for Index and is used for pointing/plain pronouns following Sandler & Lillo-Martin (2006). Digits and letters accompanying indices and agreeing verbs are used for overt referential indices, where digits (IX-1) mean persons and small cap letters mean some arbitrary locations (for instance, IX-1 SEE IX-3 means ‘I see him/her’). Small subscript letters in all examples mean semantic referential indices. IX-PL or any agreeing sign followed by –PL indicates a plural form which in the case of pointing is a sign with a smooth arc movement. POSS stands for possessive pronouns. SEBA+IX-A means that the pointing to the location A is analysed as an agreement marker of the reflexive SEBA in the given example. We use English glosses for RSL examples. The only exception is the signs for reflexives, which are glossed as SEBA and SVOJ for RSL (from Russian words *seb’a* ‘self’ and *svoj* ‘someone’s own, self’s’).

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