Referential Choice in Signed and Spoken Languages[1]

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Abstract

We offer an explicit comparison of referential processes in two most contrasting language types – spoken and signed languages. We compare referential processes of Russian Sign Language (RSL) with those of Russian. Like spoken languages, RSL demonstrates a fundamental difference between deixis and anaphora. Deictic reference is performed by pointing signs (similar to demonstratives of spoken languages), and anaphora by zero expressions and full NPs. The choice between anaphoric devices is guided by activation factors similar to those operating in spoken languages. RSL puts strong emphasis on zero anaphora, similarly to languages like Chinese. In contrast to spoken languages, a third important type of referential devices is found in RSL, called quasi-deictic reference. By this process the signer employs pointing signs (like in deixis) for making reference to entities that are not present in the surrounding physical space, but have been placed by the signer in an artificial constructed space in his or her signing arena. The signer thus projects his/her inner conceptual space onto the external constructed space.

1. Introduction

We approach the phenomenon of reference from the speaker's perspective. That is, we are interested in how the speaker chooses between the available options when s/he wants to mention a referent at a certain point in discourse. In accordance with that approach, we use the term *referential choice* meaning a decision making process constantly operating in the speaker's cognitive system in the course of discourse production.

Languages differ in which referential options they provide to the speaker and in what factors influence the referential choice. In this paper, we are going to look into the differences between the two most contrasting types of natural languages: spoken languages and signed languages. Of course, so far students of referential choice have paid most attention to spoken languages. Also, students of signed languages usually describe them in their own terms and rarely offer explicit comparison with spoken languages. In this paper, we compare referential systems of one spoken language (Russian) and one signed language (Russian Sign Language). Relying on the knowledge of referential choice in spoken languages, we are going to demonstrate some peculiarities of referential choice in signed languages. In section 2 we provide a very brief introduction into referential choice in Russian, to make our approach clear to the reader. Using this introduction as a background, in the subsequent sections we outline referential processes of Russian Sign Language, including deixis, anaphora and quasi-deixis.

2. Referential choice in Russian

In Russian, as in other spoken languages, there is an important difference between deictic and anaphoric reference. *Deixis* is reference to entities in the speaker's and addressee's *perceptual space*. Perceptual space is a projection of the external *physical space* shared by the interlocutors onto their cognitive representation. In Fig. 2 (see section 8) the physical space is labeled P and the corresponding perceptual space labeled P′. The projection of space P onto space P′ is indicated by the longer arrow in Fig. 2. A deictic reference occurs if, for example, the speaker points at a cat visible both to him/herself and to the addressee and says *Take him with you*. Another major kind of deictic expressions is first and second person pronouns referring to interlocutors – salient elements of the physical space of discourse.

In case of the *anaphoric* use of referential expressions, referents are not perceptually available, but are conceived of by interlocutors. The interlocutors' shared cognitive representation thus has another portion that we tentatively term *conceptual space* – space C in Fig. 2. At any given moment in discourse, the speaker and the addressee know which referents are activated in space C. The use of anaphoric expressions depends on a referent's degree of activation. If activation is currently below a certain threshold, lexically full expressions are used, and if it is above the threshold, reduced referential devices are used.

In Russian, the basic anaphoric options include:
- full NPs
- reduced referential devices, including:
  - third person pronouns
  - demonstratives
  - zero NPs

Zero anaphors, have a very limited distribution in Russian (Kibrik, 2004). Other languages, such as Chinese, mostly employ the zero form of reduced reference. Nominal demonstratives are also a low-frequency device in Russian.

As has been shown in Kibrik (2000), referential choice between the two major referential options – full NPs and third person pronouns – is guided in Russian by a set of factors, including distance to the antecedent along the discourse structure, current features of the referent (such as syntactic function of the antecedent), and permanent features of the referent (such as animacy). All of these factors combine and give rise to a cumulative cognitive status of the referent called activation score that, in turn, determines referential choice.

3. Russian Sign Language

Russian Sign Language (RSL) is used by deaf people in Russia and other countries of the former Soviet Union. It is a full-fledged natural language, with its functions,

basic features and grammatical processes comparable to those of spoken languages. RSL still remains virtually unstudied in linguistic terms. The pioneer of RSL research was Galina L. Zajceva, her work summarized in Zajceva (2000). There is an overview of RSL grammar by Grenoble (1992). Recent research includes work on RSL verbal morphology (Prozorova, 2004) and reference in RSL (Prozorova, 2006).

RSL is a visual-gestural language that uses hands and arms, facial expressions, eye gaze, head and body posture to encode linguistic information. The visual-spatial modality of the language determines its specific properties. Signed discourse takes place in a three-dimensional area in front of the signer, further referred to as the *signing arena* (*signing space* in Bellugi, 1972). As will be seen below, this arena and its topology play a significant role in the RSL referential system.

In this study we investigate referential choice in a corpus (657 clauses) of RSL narratives based on 10 retellings of 'The Pear Stories' film (Chafe, 1980). Our investigation builds upon prior studies of other signed languages, primarily American Sign Language (see Klima & Bellugi, 1979; Valli & Lucas, 1995).

Major referential devices found in our RSL corpus are:

- full NPs (with a nominal sign as the head of the phrase);
- nominal pointing signs (pointing at a referent with an index finger), usually called personal pronouns (for example, Meier, 1991);
- zero expressions.

In our study we considered reference to animate referents only. There were 7 animate referents in the film: 6 characters that acted individually plus a group of three boys that acted as a single entity. On the whole, to make reference to these characters 542 referential devices were used: 114 full NPs, 27 nominal pointing signs and 401 zero mentions.

4. Deictic reference in RSL

In RSL, as well as in Russian, deictic reference takes place when referents are physically present and perceivable to both the signer and the addressee. To produce a deictic mention of a referent, the signer makes a pointing sign (points with his/her index finger) in the corresponding direction:

(1) THAT$^{\rightarrow R}$ TELL WHAT[2]
What was he talking about?

(1) is the question about a person, sitting on the right of the signer, who has just told a story that the signer wants the addressee to repeat. To refer to that person, the signer points with her index finger to the right in the direction of that person.

It appears that pointing signs of RSL, translated into English by personal pronouns such as *he* in (1), are similar to demonstratives of spoken languages, rather than to dedicated personal pronouns. In spoken languages, original demonstratives functioning as third person pronouns are quite common. This is, for example, the

situation in most Turkic languages. According to Bhat (2005), about a half of spoken languages display formal resemblance between demonstratives and third person pronouns.

What seems to be unique about RSL (and apparently other signed languages), is that they lack dedicated first and second person forms and use demonstratives in this function as well: the same kind of pointing signs are employed when the signer refers to him/herself or to the addressee. For example, first person reference occurs when the signer points to his/her chest. It is only by the direction of the sign that the addressee can judge about the intended person (first, second, or third). (It should be noted that in conversation zero deictic elements also occur, especially when the signer refers to him/herself.)

RSL pointing signs are not only used as nominals, but also have the adnominal (or adjectival) usage (as part of a full NP), as well as the adverbial usage.

There is another interesting difference between signed and spoken languages with regard to the system of demonstratives. Spoken languages typically have distal and proximal demonstratives. Some systems include demonstratives that show whether the entity referred to is situated uphill or downhill from the speaker, whether it is visible or not, etc. Yet even the most elaborate systems comprise a limited number of demonstratives with categorial distinctions between them. In Diessel's (2005) sample of 234 languages, 7 languages display no distance contrast, 127 a two-way contrast, 88 a three-way contrast, and 12 a four- or more-way contrast. In RSL the number of different pointing signs is unlimited, as they may be produced in any possible direction. One can say that spoken language systems are digital (discrete) while pointing signs of signed languages are of an analog (continuous) nature: the locations towards which signs are directed are isomorphic to the locations of referents in the physical space.

As the corpus underlying this study consists of narratives, there are few examples of deictic expressions in it, and a thorough analysis of deictic reference in RSL is left for future research.

In order to mention referents that are not present in the signer's perceptual space, anaphoric and quasi-deictic reference is employed in RSL. To explain the notion of quasi-deictic reference, we need first to introduce one more discourse space (in addition to those described in section 2), that is of great importance for signed languages.

5. The notion of constructed space

It has been described in a number of signed language studies, primarily on American and Danish Sign Languages, how reference is being performed when referents are not present in the interlocutors' perceptual space (see Klima & Bellugi, 1979; Liddell, 1990; Winston, 1991; Engberg-Pedersen, 1993). When first introducing a referent into the discourse, the signer may "set up" a location for that referent and then make further reference to it by just directing signs towards that location. A referential location can be established in a variety of ways; see Winston (1991) for an exhaustive list.

In our corpus, the most frequent ways to establish the location of a referent are: 1) to use a full NP with an adnominal pointing sign (that is, before or after producing

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[2] Transcription conventions are explained at the end of the article.

a nominal sign for a referent the signer points with the index finger in a particular direction); 2) to use a spatial verb (that is, before or after producing a nominal sign for a referent the signer produces a predicate sign in which the position and/or the movement path of the hand displays the position and/or the movement path of the referent, see example (3); 3) a combination of the first two, see example (2).

The locations of referents are not chosen at random but demonstrate the way the signer conceptualizes referents, their position, orientation, physical interactions and even abstract relations between them. Thus, as the discourse goes on, the inner conceptual space of the signer maps onto his/her signing arena. This idea was first proposed and then developed in the work of Liddell (1995, 2003).

We call the projection of the inner conceptual space onto the external signing arena the *constructed space*. In Fig. 2 it is labeled C′. It is shown with the shorter arrow that space C is projected onto space C′.

In our corpus, the three-dimensional constructed space was used to reproduce the topology of referents in an analog manner, that is, isomorphic to how the signers remembered them to be located in the Pear Film. For example, in the film a specific character (a young man with a goat) was seen as appearing at a distance and moving towards the spectator (see Fig.1):

Fig.1. An episode from the Pear Film

When describing this scene as he remembered it, the signer located a new referent at a distance in front of himself and showed that the person was approaching him:

(2)

HUMAN-GO$^{\rightarrow S}$ THERE$^{\rightarrow RF}$ BOY

1. *Someone is coming from the front.*
2. *It is a boy over there.*

In (2.1), in order to describe the referent's original location and motion, the signer used a special sign construction in which the movement path of the hand shows the movement path of the referent and the handshape morpheme displays some salient characteristics of the referent: its form (two-legged), its animacy (by moving the "legs"). Such handshape morphemes are usually called classifiers. Liddell (1990) argues that classifiers are visible substitute for the referents in the signer's signing arena (which he compares to a stage on which actors occupy certain positions). Thus the link between a classifier and the referent this classifier

stands for seems to be rather of metaphorical and not of referential nature. Classifiers of signed languages are one of the most powerful devices that serve to evoke the referents' images in the constructed space.

In spoken narratives interlocutors rely on the representation of referents in their conceptual space, responsible for anaphoric reference. In RSL both the conceptual and the constructed space are employed, which gives rise to two different modes of reference: anaphoric and quasi-deictic.

## 6. Anaphoric and quasi-deictic reference in RSL

In RSL referents are typically introduced into the discourse with full NPs, with or without an adnominal pointing sign. (The only other way of introducing referents is by means of classifiers just discussed.) In our corpus about a half of all full NPs (55) were used in this introductory function.

In order to mention the referent that was already introduced into the discourse, the signer chooses between full NPs, zero NPs, and nominal pointing signs. Among full NPs two subclasses must be identified: 1) full NPs that include an adnominal pointing sign; 2) bare full NPs.

Anaphoric reference is performed by two major devices: zero NPs and bare full NPs. Examples of anaphoric reference will be provided in section 7.

Nominal pointing signs perform *quasi-deictic* reference. The formal kinds of devices are the same as used in case of deictic reference. However, there is a functional difference: referents are absent from the physical (and, accordingly, perceptual) space. They are found in the constructed space instead; the direction of quasi-deictic pointing signs is determined by the location of an imagined referent in the constructed space.
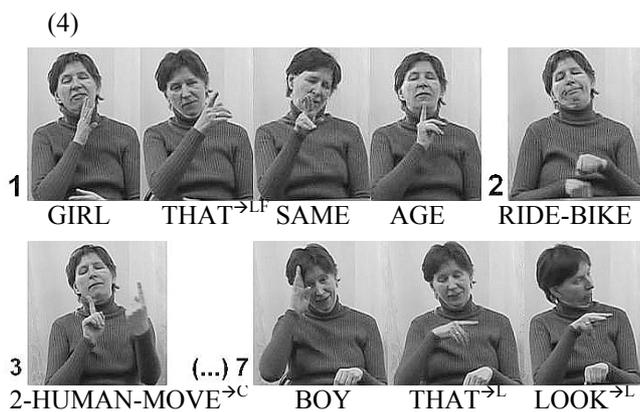
(3)

HUMAN-MOVE$^{\rightarrow S}$ MAN   THAT$^{\rightarrow F}$ PULL
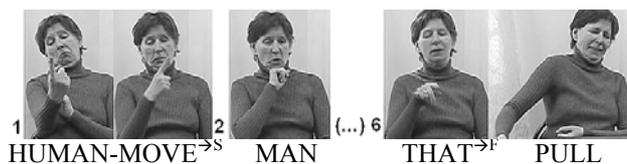
1. *Someone is approaching from the front.*
2. *It is a man$_i$.*
...
6. *He$_i$ is pulling $\emptyset_k$* [= the goat].

In (3.1) the location of the man in the constructed space was "set up" by means of the spatial verb HUMAN-MOVE. The signer produces this verb in a certain location in front of herself. Then she introduces the man's goat, and still later on, in clause (3.6), produces a pointing sign towards the location established in (3.1), and by doing so refers to the man. The quasi-deictic pointing signs are formally the same as deictic signs that could be used if the man were present at the moment of signing and moving along the same path before the signer's eyes.

Note that the location of a referent in the constructed space can change over time, in accordance with its changes in the signer's memories. In (4.1) a new referent, a girl, is introduced into the narrative with a full NP with an adnominal pointing sign GIRL THAT$^{\rightarrow LF}$:

(4)

GIRL   THAT$^{\rightarrow L}$ SAME   AGE   RIDE-BIKE

2-HUMAN-MOVE$^{\rightarrow C}$ BOY   THAT$^{\rightarrow L}$ LOOK$^{\rightarrow L}$

1. *In the front there is a girl$_i$ of the same age.*
2. *Ø$_i$ is riding a bicycle.*
3. *The two of them are moving towards each other.*
...
7. *The boy looks at her$_i$.*

Indicating the girl's location in (4.1), the signer directs the pointing sign at a certain point far in front of herself. Several clauses later on, in (4.7), the girl is referred to with a nominal pointing sign, now directed to the left of the signer (THAT$^{\rightarrow L}$). The addressee easily identifies the pointing sign in (4.7) with the girl, because the signer has visualized the girl's movement path, mentioning in (4.3) that the girl was approaching the boy, so it is not surprising that in (4.7) she is located on the left of the boy.

The status of non-introductory full NPs including an adnominal pointing sign as either anaphoric or quasi-deictic is not sufficiently clear to us at this time and calls for further investigation.

7. Referential choice in RSL

In RSL as well as in Russian, referential choice depends on the activation of the referent. Two major factors that influence the total activation score of animate referents have been identified: 1) referential distance (RD) to the antecedent; 2) when RD=1, the syntactic role of the antecedent (whether it is the subject or an object of its clause). The results are found in Table 1. Figures in the boxes of the table represent the frequencies of the corresponding referential devices under the given values of the factors.

factor 1	**RD=1**		**RD=2**	**RD=3+**	**TOTAL**
factor 2	**Ant=S**	**Ant=O**			
bare full NP	2 (<1 %)	6 (25 %)	6 (14 %)	28 (38 %)	42
full NP with THAT	1 (<1 %)	2 (8 %)	0	14 (19 %)	17
nominal THAT	1 (<1 %)	6 (25 %)	8 (19 %)	12 (16 %)	27
zero NP	342 (99 %)	10 (42 %)	29 (67 %)	20 (27 %)	401
TOTAL	346 (100%)	24 (100%)	43 (100%)	74 (100%)	487

Table 1. Activation factors and frequencies of anaphoric and quasi-deictic referential devices in corpus

As can be seen from Table 1, zero anaphors are strongly associated with the highest level of activation (RD=1; Ant=S). When RD=2, there still exists a preference for zero anaphors. Under RD=3+ the signer is more likely to use the alternative anaphoric device, that is, a full NP. Still in RSL it is sometimes possible to use zero anaphors under a significant distance to the antecedent. What helps to identify the referent of a zero anaphor in such cases, are various semantic and pragmatic clues such as: 1) certain predicates that have already become associated with a particular referent (the most common example in our corpus was the predicate RIDE-BICYCLE as well as HOLD-BICYCLE, associated with the main character of the film – the boy with a bicycle who was stealing pears); 2) semantic (in)compatibility of the clause context with certain referents. These underspecified usages of zero anaphors resemble comparable phenomena in such a heavily zero-anaphora-based language as Chinese (Tao, 1996).

Yet the most important way to distinguish between concurrently activated referents is the so called "role-shifting" (Padden, 1986), a device found in signed languages only. "Role-shifting" is a process by which the signer shifts (rotates) the body and/or changes his/her facial expression to demonstrate that s/he is currently "acting" as a particular referent:

(5)

LOOK$^{\rightarrow U}$ THAT$^{\rightarrow U}$ PICK   look up   LOOK$^{\rightarrow D}$
1. *Ø$_i$ looks up.*
2. *He$_k$ keeps picking pears.*
3. *Ø$_i$ looks down.*

When signing (5.1) and (5.3), the signer is adopting the role of referent *i* (the boy who wants to steal pears) and makes a wily facial expression. In (5.2), in contrast, the signer adopts the role of referent *k* (the man) who keeps picking pears from the tree without noticing the boy, and the signer's facial expression thus changes to absent-minded. Now, there is a zero anaphor in (5.3), used despite RD=2 and a potential ambiguity. This is possible due to the facial expression of the signer, turning wily again, and a slight rotation of her body making clear that the referent in question is the boy and not the man mentioned in the immediately preceding clause.

Zero anaphors are used prolifically in RSL. In our corpus they make over 70% of all referential expressions. In this regard RSL is more like Chinese than Russian.

As the data in Table 1 suggest, nominal pointing signs are not particularly sensitive to activation factors. They are not observed under very high activation (RD=1, Ant=S), since there is a very strong competition of zero anaphora in this situation. But under other values of factors nominal pointing signs are found with comparable frequencies. This corroborates our suggestion that they are not anaphoric devices, and are functionally much closer to deixis. In contrast, anaphoric devices (bare full NPs and zero NPs) are clearly sensitive to activation factors: their frequencies are changing significantly along the cline of activation levels (the horizontal dimension of Table 1).

If RD=1, full NPs and nominal pointing signs are used only in case the antecedent is an object of its clause and thus mark the switch of the subject:

(6)

HUMAN-MOVE$^{\rightarrow L}$ ---------GIVE$^{\rightarrow L}$--------------THAT$^{\rightarrow L}$

BOY   THAT$^{\rightarrow L}$ HOLD-BIKE --------THANK------------

1. *The person$_i$ comes.*
2. *Ø$_i$ gives it to him$_k$.*
3. *That boy$_k$ who holds the bicycle*
4. *Ø$_k$ says thanks.*

In (6) referent *i* is the subject of clauses (6.1) and (6.2). Referent *k* is referred to in (6.2) with a pointing sign and its syntactic role is that of an object, whereas in (6.3) and (6.4) referent *k* becomes the subject. The full noun phrase BOY THAT$^{\rightarrow L}$ in (6.3) refers to referent *k* and marks switch-subject.

These is another factor that influences referential choice in RSL, but is not reflected in Table 1. This factor is the referent's syntactic role in its own clause. In our corpus, if an animate referent was its clause's object, the only way to express that referent explicitly was to use a nominal pointing sign (see (6.2) for an example). About 40% of pointing signs in our corpus were used in this function.

Since both full NPs and nominal pointing signs can be used to mark switch-subject, the question arises, what factors guide the choice between these referential devices. According to the evidence available at this time, it appears that the signer is likely to choose a pointing sign when s/he believes the addressee remembers which referent is associated with the given location, and a full NP otherwise. Consider the following example (7):

(7)

GO-AWAY$^{\rightarrow LF}$ THAT$^{\rightarrow U}$ MAN   PICK

THAT$^{\rightarrow L}$ RIDE-BIKE THERE$^{\rightarrow F}$

1. *Ø$_i$ left.*
2. *That man$_k$ up there is picking pears.*
3. *He$_i$ keeps cycling forward.*

The main protagonist in (7) is referent *i* (the boy), but in (7.2) the signer switches to the man gathering pears. The man is referred to with the full noun phrase THAT$^{\rightarrow U}$

MAN 'that man up there'. The reason is that the last previous mention of the man occurred 11 clauses ago, and this referent has thus been strongly deactivated. In contrast, the boy in (7.3) is referred to with the pointing sign THAT$^{\rightarrow L}$. Even though deactivation takes place here as well (RD=2), it is not as strong. The signer had defined the boy's location with the help of the verb GO-AWAY in (7.1), so in (7.3) the knowledge of that location is assumed to be still available to the addressee.

8. Conclusion

In Russian that serves here as a representative of the spoken language type, it is useful to distinguish two cognitive spaces involved in the processes of reference in discourse, see Fig. 2. The first one, the perceptual space, is a projection of the physical space surrounding the interlocutors. Referring to elements of the perceptual space is what is known as deixis. The second kind of the interlocutors' cognitive space is the conceptual space, inhabited by referents that are remembered, imagined, but not immediately perceived. Referring to entities currently activated in this space is what is known as anaphora. Thus there is one external space and two internal (cognitive) spaces accounting for the process of reference in spoken languages.
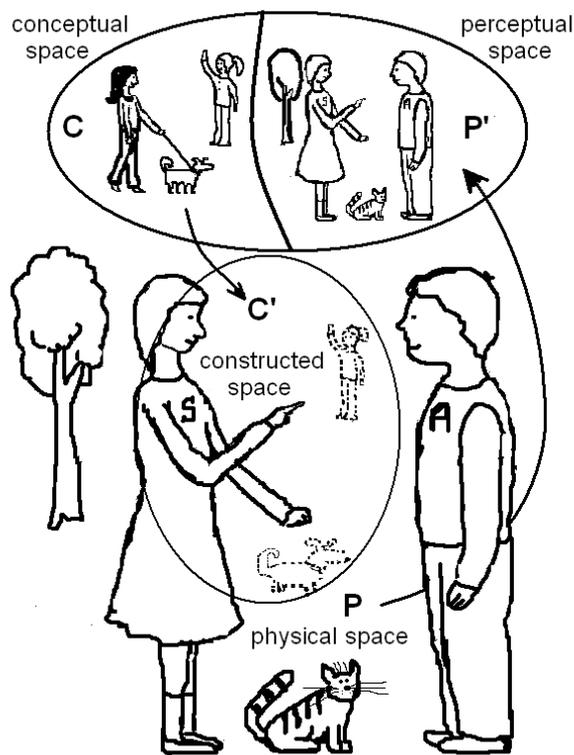

Fig. 2. Discourse spaces

In RSL, all the three aforementioned spaces are also relevant. We have discussed instances of deictic and anaphoric reference, similar to those in spoken languages. In particular, we have identified multiple instances of anaphoric full and zero NPs, very similar to those of spoken languages.

However, one needs to posit one additional external space, crucial for understanding reference in RSL. This is the constructed space – an overt projection of the

conceptual space, including locations and referents, onto the signing arena. As the conceptual space, the constructed space is inhabited by referents being thought of but not present in the environment, see Fig. 2. The topology of the constructed space is isomorphic to that of the conceptual space. When referring to entities in the constructed space, signers employ the procedure that is very similar to deixis. We call it quasi-deixis, because referents are identified by their locations in the constructed space, even though they are not actually present in the physical environment.

Clearly, a prerequisite for using this additional space in signed languages is the modality employed for information encoding. The referential system of RSL makes use of the visual modality, and this allows creating an "analog", isomorphic model of the remembered situations. In contrast, the auditory modality does not provision such isomorphism. Spoken languages are rather "digital" in their formal expression and interlocutors can only rely on the shared cognitive space.

Taking signed languages into consideration makes it possible to offer a fresh look at spoken languages. In particular, one can notice that in spoken discourse there are traces of using an "analog" space as well, that is, spontaneous gestures of the speaker that locate imagined referents in space in front of him/her in correspondence with their location in the remembered situation.

Transcription conventions

English words in capital letters represent manual signs (like BOY). Several words connected by hyphens may stand for one sign in order to show that the sign consists of several meaningful components (like HUMAN-GO$^{\rightarrow S}$). The index after an arrow in superscript displays the direction in which the sign is produced. The following abbreviations are used in the indices: R – rightward; L – leftward; F – forward; LF – left-forward; RF – right-forward; U – upward; D – downward; S – towards the signer; C – towards each other. The pointing signs are glossed as THAT when used nominally or adnominally; and as THERE when used adverbially. English words in lower case letters represent the signer's gesticulation (like *look up* in (4.3)).

Acknowledgements

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