2 Reference tracking

Summary 2.1 Pronouns. – 2.2 Other means.

In the following sections, anaphoric pronouns will be described in relation to their properties [PRAGMATICS 2.1]. Anaphoric pronouns are linguistic elements which express co-reference with a previously mentioned item. However, co-referentiality can also be expressed by means of verbal agreement [PRAGMATICS 2.2.1], classifiers handshapes [PRAGMATICS 2.2.2], and buoys [PRAGMATICS 2.2.3].

2.1 Pronouns

Pronouns are linguistic elements which can express co-reference [LEXICON 3.7]. Co-reference occurs when two or more expressions refer to the same entity. Co-referential elements are usually composed of a full form, namely the antecedent, such as a noun, and an abbreviated form, which is the anaphoric element, for example a pronoun. Indeed, pronominal expressions are the main means of expressing co-reference in LIS. Referents are associated with certain areas in signing space, called referential loci. Pointing to a specific area in space activates the referents associated with this area. For instance, in the sentence below the referent BEAR is associated with locus *a*. Several sentences later, the signer can use the same locus *a* in order to refer back to the bear.

BEAR IX$_a$ FEAR [...] IX$_{3a}$ RUN AWAY
'The bear was scared [...] He ran away.'

LIS seems to distinguish between different types of pronouns: reflexive pronouns, personal pronouns, possessive pronoun, the anaphoric pronoun PE and logophoric pronouns [LEXICON 3.7]. In LIS, the differences between the types of pronouns can decide which kind of co-referentiality they bear. Specifically, reflexive pronouns appear to express co-reference between discourse referents within one clause. Other types of pronouns, like personal pronouns and possessive pronouns, behave differently and can express co-reference with discourse referents also outside the boundaries of the clause where they are placed, or in a non-local domain.

As for reflexive pronouns, in the example below the two co-referential elements are the noun phrase MARIA and the reflexive pronoun SELF. Since the meaning of SELF depends on the meaning of MARIA, we will say that SELF is bound by MARIA.

MARIA LOVE SELF
'Maria loves himself.'

The sign SELF can also be used in other contexts as an emphatic form of intensification, as shown in the example below. In cases like this, SELF is not really used to refer back to the personal pronoun 'I' (IX$_1$), but to communicate the idea of performing the action in an independent way.

IX$_1$ PAY SELF
'I have paid by myself.'

As said before, reflexive pronouns must take their antecedent in their clause, a local context. Another example of a reflexive pronoun locally bound by its antecedent is presented below, where the reflexive pronoun SELF can only refer to the proper name MARIA.

GIANNI REPORT MARIA$_a$ IX$_a$ LOVE ONLY SELF
'Gianni said that Maria loves only herself.'

There are situations when co-reference can also occur between a quantifier [LEXICON 3.10.2] and an anaphoric pronoun, such as in the examples below. In this case, since the reflexive pronoun SELF refers to the quantifier expression YOUNG EACH, the reflexive pronoun is semantically bound by the quantifier, and not simply co-referential with it. This special relation is defined 'semantically bound'. Indeed, since the expression YOUNG EACH is a quantifier, it is not possible to say that YOUNG EACH has a specific referential pronoun.

YOUNG EACH PAINT ONLY SELF
'Every young boy paints himself only.'

As anticipated before, other types of pronouns are personal pronouns and possessive pronouns. Unlike reflexive pronouns, personal and possessive pronouns behave differently. They seem to express co-reference with discourse referents which are not contained into the boundaries of the clause or into their local domain. As for personal pronouns [LEXICON 3.7.2], they are usually expressed by pointing signs, or by other means which will be discussed in the following paragraphs. An example of personal pronoun is shown below, where the third person pronoun IX_{3b} refers to an entity which is not locally expressed. This is the reason why MARCO and IX_{3b} are not co-indexed. Different entities which are not co-referential are indicated in the glosses with different indices, in this case with *a* and *b* respectively. In LIS, non-coreferential items are realised in different loci of the signing space.

$MARCO_a$ IX_{3b} $_{3a}HELP_{3b}$
'Marco helps her.'

As shown above, in LIS co-referentiality is spatially expressed [PRAGMATICS 8]. Co-referential elements are localised in the same area (as GIANNI and the personal pronoun IX_3 in the example below). Furthermore, the anaphoric element (which in the example below is the pronouns IX_3) can be expressed through pointing in the same area of the antecedent (in this case GIANNI), as in the example below. Unlike spoken languages, sign languages can resort to this spatial strategy of co-referentiality to avoid any ambiguous interpretation.

$GIANNI_a$ $PIERO_b$ $_aSEE_b$. IX_{3a} HOUSE GO_AWAY
'Gianni saw Piero. Then he went home.'

The personal pronoun IX_3 clearly refers back to Gianni and not to Piero, because it is realised in the same locus of the signing space of Gianni, indicated with *a* in the example above.

However, this explicit co-reference can be avoided, if there is overt verbal agreement [MORPHOLOGY 3.1], as in the example below. Here, the co-reference with LUCIA is yielded by the agreement of the verb HATE, which is a directional verb. These cases will be further discussed in the next section.

$LUCIA_a$ $MARCO_b$ IX_b IX_{3a} $LOVE_b$. IX_{3b} $_bHATE_a$
'Lucia loves Marco. He hates her.'

Possessive pronouns, like personal pronouns, in LIS also refer to entities which are not expressed in their local domain or within the boundaries of the clause. This case is shown in the example below, where the possessive pronoun POSS$_3$ (realised with the handshape unspread 5) refers to the proper noun GIANNI, because both (the antecedent GIANNI and the possessive pronoun POSS$_3$) are articulated in the same referential locus, namely the signing space *a*.

> GIANNI$_a$ KNOW MARIO$_b$ IX$_b$ LIKE LOVE CAT POSS(5)$_{3a}$
> 'Gianni knows that Mario loves his (Gianni's) cat.'

Variant forms of the possessive pronoun above are the forms realised with handshape G and wrist pivoting from radial to ulnar, as in (a), or without wrist rotation, as in (b).

> a. GIANNI$_a$ KNOW IX$_b$ MARIO$_b$ LOVE LIKE CAT POSS(G)$_{[pivoting]3a}$
> 'Gianni knows that Mario loves his (Gianni's) cat.'

> b. GIANNI$_a$ KNOW IX$_b$ MARIO$_b$ LOVE LIKE CAT POSS(G)$_{[non-pivoting]3a}$
> 'Gianni knows that Mario loves his (Gianni's) cat.'

Other tests exist to illustrate the difference between possessive and reflexive pronouns, one of these tests is the ellipsis of the verbal phrase [SYNTAX 2.5], as shown in the sentences below. In the example below, the unpronounced reflexive pronoun in the clause with ellipsis (SELF) can only refer to the nearest antecedent (GIANNI). The sentence means: 'Maria loves herself and Gianni loves himself'.

> MARIA$_a$ LOVE SELF. GIANNI$_b$ IDENTICAL
> 'Maria loves herself, Gianni does so too.'

By contrast, the possessive pronoun, shown below, is more flexible in its interpretation since the unpronounced possessive pronoun (POSS$_3$) in the clause with ellipsis (IDENTICAL) can refer either to MARIA, or to GIANNI, even if GIANNI is the closest antecedent. Thus, the sentence can have two meanings reported below.

> MARIA$_a$ CAT POSS$_{3a}$ LOVE$_a$. IX$_b$ GIANNI$_b$ IDENTICAL
> 'Maria loves her cat, Gianni does too (love her cat).'
> 'Maria loves her cat, Gianni does too (love his cat).'

A specific case of anaphoric pronoun in LIS is represented by PE [LEXICON 3.7] and [SYNTAX 3.4.2.1]. PE is a pointer to the noun which is modified by a relative clause, as in the example below.

$$\overline{\qquad\qquad\qquad\qquad\qquad\qquad\text{rel}\qquad}$$

BOOK$_a$ IX(dem)$_a$ MARIA LOAN CL(flat open 5): 'give_book' PE$_a$ DISAPPEAR ✋

'The book that Maria lent has disappeared.'

Finally, an interesting case of co-referentiality in LIS concerns the logophoricity of first personal and possessive pronouns under role shift [LEXICON 3.7.2.7]; [PRAGMATICS 6]. In LIS, after a character has been introduced, the signer can assume the point of view of this character, for example by moving his/her body towards the position in space associated to that character. In these cases, even though the signer points to himself, curiously, the pronoun co-refers with the previously introduced character, and it does not refer to the real signer anymore. The use of first personal pronoun IX$_1$ which is signed in combination with the use of role shift is shown in the example below.

$$\overline{\qquad\qquad\qquad\text{rs}\qquad\qquad}$$

MARIA KNOW IX$_1$ INTELLIGENT ✋
'Maria knows that she is smart.'

In the example above, the point of view of the referent MARIA is assumed by the signer, through role shift. Therefore, the first personal pronoun IX$_1$ does not refer to the signer anymore, but it refers to MARIA. The crucial element in the case of role shift is that the signer loses eye contact with the addressee.

2.2   Other means

Although pronouns are the most frequent co-referential element in LIS, they are not the only ones. In fact, other morphosyntactic strategies exist in order to track back referents, such as spatial agreement, classifier handshapes and buoys.

2.2.1 Agreement

The signing space can be used arbitrarily in order to place referents within the discourse. Some verbs, changing direction or movement, agree with the loci associated with their arguments. Indeed, spatial verbal agreement [MORPHOLOGY 3.1] is used as a co-referential mean. Often, the antecedent is previously realised in a specific point of the signing space, therefore overt co-referential elements can be omitted in the following sentences without giving rise to ambiguity. The

example below shows a case of spatial verbal agreement used without explicit anaphoric forms.

> LUCA_a CL(flat closed 5): 'be_at_a' GIOVANNI_b CL(flat closed 5): 'be_at_b'.
> BOOK RED _bCL(flat open 5): 'give_book'_a
> 'He (Giovanni) gives him (Luca) a red book.'

Sometimes, spatial verbs [LEXICON 3.2.3] agree with topographic locations instead of arguments. The topographic use of space iconically expresses the spatial relation among referents like in the example below, where the classifier predicate CL(closed 5): 'open _door' is directed towards the door.

> CL(closed 5): 'open_door' PALM_UP
> 'Open it (the door)!'

In the sentence above, the verb is signed in the direction of the door, but neither the linguistic expression DOOR, nor an overt linguistic realisation of the referent has ever been mentioned by the signer. As in verbal agreement, spatial verbs are still cases of reference tracking where the co-reference of topographic locations is realised through spatial agreement.

2.2.2 Classifier handshapes

In classifier predicates [MORPHOLOGY 5.1] the handshape classifier can help in retrieving the antecedent. In fact, these classifiers can identify a class of objects by representing iconically the properties of the entity they describe, such as shape, size or the way in which they are handled. Frequently, the use of classifiers is enough and no other referential means, such as pronouns, are needed in order to disambiguate their referents.

The sentence below shows an example of these specific uses of classifiers. First, the sign CAT and PERSON++ are introduced. Then, the cat walks around, but the repetition of the sign CAT is not necessary anymore. Indeed, the classifier CL(flat closed 5): 'cat_walk' is enough to track back the reference of the cat.

> CAT IX_a HUNGER STRONG PERSON++ BARE. CL(flat closed 5): 'cat_walk'
> FOOD LOOK_FOR
> 'The cat is very hungry. There is nobody around. He walks around looking for some food.'

The most commonly used types of predicative classifiers are entity classifiers [MORPHOLOGY 5.1.1], body part classifiers [MORPHOLOGY 5.1.2] and handle classifiers [MORPHOLOGY 5.1.3]. On the other hand, Size and Shape Specifiers (SASS) [MORPHOLOGY 5.2] are not used for reference tracking.

2.2.3 Buoys

In a discourse, signers can hold the handshape of a sign with the non-dominant hand, while the dominant hand continues to sign independently. This phenomenon is called weak hand holds and it can have two different functions. One concerns the discourse level, where the non-dominant hand simply expresses discourse relations, while in other cases the information held with the non-dominant hand still represents a co-referential meaning: these latter cases are called buoys [LEXICON 1.2.3].

In LIS, several types of buoys can be identified: list buoys, pointer buoys, theme buoys and fragment buoys.

List buoys are the outstretched fingers which function to track a certain number of referents. Each finger ensures a co-referential link to the discourse referents, as in the example below, where the signer refers to his fingers to keep track of his brothers in the discourse.

dom: IX_1 BROTHER THREE EXIST $IX_{[thumb]}$ LAWYER $IX_{[index]}$ DOCTOR $IX_{[middle]}$ TEACHER

n-dom: BROTHER THREE

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'I have three brothers, the first is a doctor, the second a lawyer, and the third a teacher.'

The signer may also point to the fingers with the dominant hand in order to retrieve that specific co-referent.

Pointer buoys are pronominal elements realised by the non-dominant hand. These buoys are very similar to pointing pronouns, but they are articulated simultaneously to the other signs. The example below shows this phenomenon.

dom: BEAR IX_{3b} MEAN IX_{3b} 🖐
n-dom: SEE. IX_{3b}-----------
'The bear sees it and considers it mean.'

Theme buoys are holding signs which represent prominent information at the discourse sentence. They are realised through pointing and their function is to preserve the saliency of these referents along

the signed discourse, unlike the pointer buoys which are just arguments of a single sentence. In the example below, the theme buoy refers to some bad situation happened to the signer.

dom   SAD IX$_{3a}$ BE_OBSESSED Q$_{artichoke}$ IX$_1$ UNDERSTAND NOT

n-dom: IX$_{3a}$ -- 🖐

'He is sad and he is obsessed with something I don't understand.'

Sometimes, these prominent referents can be realised through a full lexical sign, which has been held for the whole duration of the related discourse. In these cases, the referents are called fragment buoys.

dom: BOOK IX(dem) IX$_1$ READ IX$_1$ THINK INTERESTING 🖐

n-dom: BOOK--

'I read this book and think it is interesting.'

Information on Data and Consultants

The descriptions in this chapter are based on the references below. Please see the data and consultant information in these references. The video clips exemplifying the linguistic data have been produced by a fluent native signer who was born and grown in the northern part of Italy.

Authorship Information

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References

Bertone, C. (2011). *Fondamenti di grammatica della lingua dei segni italiana*. Milano: Franco Angeli. [2.1], [2.2]

Cecchetto, C.; Checchetto, A.; Geraci, C.; Santoro, M.; Zucchi, S. (2015). "The Syntax of Predicate Ellipsis in Italian Sign Language (LIS)". *Lingua*, 166, 214-35. [2.1]

Cecchetto, C.; Zucchi, S. (2006). "Condizioni di verità, sottospecificazione e discorso nelle lingue dei segni". Pititto, R.; Venezia, S. (a cura di), *Tradurre e comprendere. Pluralità dei linguaggi e delle culture*. Roma: Aracne editrice, 353-85. [2.2.2]

Corazza, S. (1990). "The Morphology of Classifier Handshapes in Italian Sign Language (LIS)". Lucas, C. (ed.), *Sign Language Research: Theoretical Issues*. Washington: Gallaudet University Press, 71-82. [2.2.2]

Mazzoni, L. (2008). *Classificatori e impersonamento nella Lingua dei Segni Italiana*. Pisa: Edizioni Plus, Pisa University Press. [2.1], [2.2.2]

Pizzuto, E. (2009). "Meccanismi di coesione testuale e Strutture di Grande Iconicità nella Lingua dei Segni Italiana (LIS) e altre lingue dei segni". Bertone, C.; Cardinaletti, A. (a cura di), *Alcuni capitoli della grammatica della LIS = Atti della Giornata di Studio* (16-17 maggio 2007). Venezia: Editrice Cafoscarina, 137-58. [2.1]