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Indexical signs (IX) in clause-final position in Italian Sign Language (LIS)
A preliminary study

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to my teachers.
to my classmates.

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Acknowledgements

Years ago, when I was a beginner student of Italian Sign Language, I was first introduced to polar interrogative sentences with a clause-final indexical sign, such as: “YOU COFFEE WANT YOU?”. I can clearly remember being somewhat disoriented at that, and I can well remember the following question, asked so many times by everyone in the class: “Teacher, but if we already signed YOU at the beginning of the sentence, why do we have to repeat it at the end of it?”

Years later, I happen to be investigating this very structure, along with other similar ones.

I hope to have finally found an answer to that question – or, at least, to have come a little bit closer to it.

Enjoy the ride.

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List of abbreviations and symbols

NEWSPAPER	Gloss of a sign
IX	Indexical sign
IX ₁	First-person singular pronoun
IX ₂	Second-person singular pronoun
IX ₃	Third-person singular pronoun
IX _{3P}	Third-person plural pronoun
IX _{subject}	Indexical sign co-referent with the sentence subject
IX _{object}	Indexical sign co-referent with the sentence object
IX _{locative}	Indexical sign with a locative interpretation ('here', 'there')
+	Repeated movement on a sign with a single movement in its citation form
~	Final lengthening on the clause-final sign
<i>'giornale'</i>	Mouthing or mouth gesture
mcd	Mouth corners down
mcu	Mouth corners up
pl	Pressed lips
tl	Tensed lips
llr	Lower lip raise
re	Raised eyebrows
ibr	Inner brow raise
fe	Furrowed eyebrows
sq	Squinted eyes and cheeks
se	Squinted eyes
sc	Squinted cheeks
we	Widened eyes
ne	Narrowed eyes
eb	Eyeblink
qh	Question headshake
hn	Single headnod
hn+++	Repeated headnod
hrl	Head right lean
hd	Head down
hu	Head up
nmm	Non-manual markers
neg	Negative non-manual markers
polar int.	Polar interrogative clause non-manual markers
wh	Content interrogative clause non-manual markers
conditional	Conditional clause non-manual markers
top	Topic
abt	Aboutness topic
sst-time	Scene-setting topic (time)
sst-location	Scene-setting topic (location)
crt	Contrastive topic
foc	Focus

Abstract

This thesis investigates the linguistic phenomenon in which an indexical sign (IX) optionally occurs in clause-final position in Italian Sign Language (LIS).

This phenomenon – also attested in several other sign languages – is described in previous literature on LIS as pronoun reduplication (Bertone 2011) and pronoun copying (Calderone 2020), and is associated to pragmatic functions such as topic, focus, and emphasis. It is found in a variety of syntactic structures, such as declarative clauses, polar interrogative clauses, content interrogative clauses, subordinate clauses, and object topicalizations. The clause-final indexical sign, either subject or (direct) object, is considered to be a pronoun, either clitic, weak, or strong, according to the specific characteristics displayed by features such as articulation time, movement repetition, and mouthing.

In this study, aimed at better framing and understanding the phenomenon, as well as attempting to determine the clause-final indexical sign linguistic status and the extent of its usage, four deaf native LIS signers have been administered a grammaticality judgement task and a sentence repetition task. The 44 input sentences provided to the informants, presented in different orders in the two tasks and shown on screen, are signed by a deaf native LIS signer, who also provided grammaticality judgements. Clause-final indexical subjects and clause-final indexical (direct) objects are tested and analyzed in different sentence types, namely declarative sentences, polar interrogative sentences, and content interrogative sentences. In particular, the tasks are aimed at verifying the grammaticality of the clause-final indexical sign in context depending on number features (i.e., singular or plural), type of overt realization of the antecedent within the sentence (i.e., NP or pronominal form), type of verb used (i.e., intransitive or transitive). Data analyzed in this study consist in detailed grammaticality judgements and in 131 sentences.

The proposal here advanced diverges from previous accounts on a syntactic standpoint, in that the clause-final indexical subjects are considered instances of inversion, whilst the clause-final indexical (direct) objects are considered instances of extraction from the object DP. As for the pragmatic function, data here collected align with previous studies, for the clause-final indexical sign is often related with topic agreement, emphasis, and other pragmatic purposes.

Chapter 1

Introduction – Fundamentals of Italian Sign Language

Italian Sign Language (*Lingua dei Segni Italiana* – henceforth referred to as LIS) is the sign language used by the Italian and Swiss Italian signing community.

The LIS linguistic community displays a considerable degree of heterogeneity among its users, and a singular peculiarity: since deaf individuals born to signing parents are estimated to be only a small percentage of the overall deaf signers, native deaf signers are most likely to be outnumbered by non-native deaf signers, the latter approaching sign language later in life. Furthermore, it has to be mentioned that native signers can be either deaf individuals or hearing individuals, the latter being also known with the acronym CODA, which stands for Child(ren) Of Deaf Adults. As for the overall number of LIS users, deaf sign language users in Italy are estimated to be 40,000 (EUD, 2014). On the other hand, figures on the number of hearing native signers and on the number of hearing learners are currently not available. As for active professional interpreters, they are estimated to be 200 (EUD, 2014). As a minority language used by individuals also exposed to Italian (in education, media, daily interactions with non-signers), LIS is subject to contact phenomena with the majority language.

Following the ratification of the 2006 United Nation Convention on the Rights of Persons with Disabilities (Legge 3 March 2009, n. 18) and several local and regional legislative measures, LIS and Tactile Italian Sign Language (*Lingua dei Segni Italiana Tattile*, or LIST) currently benefit from national legislative recognition, promotion, and protection as a language (Decreto Legge 22 Marzo 2021, n. 41, art. 34-ter).

In this chapter, fundamentals¹ of LIS in the phonological (§ 1.1), morphological (§ 1.2), syntactic (§ 1.3), and pragmatic (§ 1.4) domains will be introduced. A summary (§ 1.5) will close the chapter.

1.1 Phonology

Phonology is the linguistic domain concerning the meaningless, minimal units of language.

In this section, LIS sublexical structure (§ 1.1.1) and LIS synchronic phonological phenomena (§ 1.1.2) will be described.²

1.1.1 LIS sublexical structure

Signs can be articulated with one hand (the dominant hand) or with both hands (the dominant hand and the non-dominant hand). Two-handed signs can be symmetrical or asymmetrical: in the first case, both articulators are active, and display either simultaneous movement or alternating movement; in the second case, the dominant hand is active, whereas the non-dominant hand functions as place of articulation.³

¹ The primary source for this chapter is Branchini and Mantovan (eds.) (2020), except where differently specified. In relation to the literature on LIS grammar, the reader is referred to Volterra et al. (1987), Bertone (2011), and Branchini and Mantovan (eds.) (2020).

² For more details on LIS phonology, such as diachronic phonological phenomena, see Mantovan, in Branchini and Mantovan (eds.) (2020), Phonology.

³ Two-handed signs may display an articulatory reduction phenomenon, known as weak hand drop, for which the sign is articulated with the dominant hand only.

Signs are composed of a finite set of minimal units, phonemes,⁴ grouped into five different classes, known as phonological parameters: handshape, location, orientation, movement, and non-manual markers.

Handshape is defined by selected fingers and fingers configuration. Selected fingers are those that, while articulating a sign, can change their configuration, contact and place of articulation, be specified for marked finger configuration. Conversely, unselected fingers cannot do any of the aforementioned operations. Fingers configuration refers to the position acquired by selected fingers in the articulation of a sign, namely: extended finger(s), flat open, flat closed, curved open, curved closed, closed. Furthermore, some fingers configurations differentiate for the feature '(un)spread fingers'.

Location refers to the place of the signing space (i.e., the delimited area where signs are produced) in which the sign is articulated. Location can either be on the body of the signer (e.g., cheek, torso), including the non-dominant hand for two-handed asymmetrical signs, or the neutral space.

Orientation indicates which part of the active articulator(s) is directed towards the sign location. The possible orientations are referred to as: palm, back, ulnar, radial, wrist, fingertip. For signs articulated either on the body or on the non-dominant hand, orientation is identified with the hand side facing the sign location; for signs articulated in the neutral space, orientation is instead identified with the hand side pointing towards the ending point of the movement.

Movement defines the motion displayed by the sign in its articulation. Movement is classified into primary movement (or path movement) and secondary movement. Primary movement consists in location changes, whereas secondary movement consists in handshape and/or orientation changes. A sign can display either primary movement or secondary movement, or a combination of both.

Non-manual markers, in phonology, are referred to facial expressions, body movements, and oral components occurring at the lexical level. Signs are often endowed with a lexical non-manual component without which the sign would be ill-formed.⁵ As for oral components, they are distinguished into mouth gestures⁶ and mouthings.⁷ Mouth gestures are not related to spoken Italian and are produced obligatorily with the sign; vice versa, mouthings, which are partial or total reproductions of the Italian word corresponding to the sign, are not obligatory and are subject to great variability among signers. Mouthings usually appear uninflected, therefore they do not show gender, number, or verbal inflections, and, at the lexical level,⁸ they are constrained within the time of articulation of the sign, thus they can either be truncated or lengthened.

Although *per se* minimal phonological units are meaningless, Boyes-Braem (1981) argued, for ASL, that handshape and location can carry meaning, since the same minimal phonological unit is found in signs belonging to a given semantic area. A comparable phenomenon was observed for LIS (Volterra et al. 1987).

⁴ The term 'chereme' has been proposed by Stokoe (1960) to refer to the equivalent of phonemes in American Sign Language, a term later adopted for other sign languages. In more recent years, the term 'chereme' has been progressively substituted by 'phoneme'.

⁵ For instance, if the signs LOVE or HATE were produced without any facial expression or with the one characterizing the antonym they would be ill-formed.

⁶ In LIS literature, the acronym COS (Componenti Orali Speciali – lit. Special Oral Components) is also found.

⁷ In LIS literature, the acronym IPP (Immagini Parole Prestate – lit. Borrowed Words Images) is also found.

⁸ Mouthing spreading, i.e., the extension of the mouthing associated to one sign over one of more following signs, is classified as a morpho-phonological phenomenon.

1.1.2 Synchronic phonological phenomena

Synchronic phonological phenomena are those phonological phenomena that occur *in the act* of signing.⁹ In LIS, several synchronic phonological phenomena concerning aspects of the manual features of the signs have been observed: among these, assimilation, coalescence, cliticization, movement reduction and extension; synchronic reduction; repetition loss.

Assimilation is defined as a phonological phenomenon for which one sign partially or totally takes a feature of the following (regressive assimilation) or preceding (progressive assimilation) sign. It mostly occurs for handshape, but it can occur with any phonological parameter (Mantovan, 2020).¹⁰



Figure 1.1 – Regressive handshape assimilation in compound sign PSYCHOLOGIST: on the left the compound sign without assimilation, on the right the compound sign with assimilation. [Image from Parini, 2017: 14]

Coalescence is defined as a phonological process in which a lexical sign articulated symmetrically with both hands is produced in its entirety by the non-dominant hand, while the dominant hand signs half of the lexical sign and a pronoun (Sandler and Lillo-Martin 2006; for Israeli Sign Language, Nespor and Sandler 1999; Sandler 1999b, 1999c; for LIS, Mantovan 2020).¹¹



LIKE-THIS IX
'Like this one'

Figure 1.2 - Coalescence in the production of LIKE-THIS IX ('Like this one') involving a pronoun: the dominant hand articulates the pronoun while the non-dominant hand completes the lexical sign. Mouthing over both signs is the one of LIKE-THAT (COSI), of which O and I are visible in these frames. [Image from Parini, 2017: 17]

⁹ Conversely, diachronic phonological phenomena are those phonological phenomena occurring *over time*.

¹⁰ Mantovan, in Branchini and Mantovan (eds.) (2020), Phonology: 3.1.1 Assimilation. / On a side note, in Parini (2017) a singular case of assimilation was described. In the string made of the signs WORK INSIDE, regressive assimilation of the non-dominant hand handshape was observed (i.e., the non-dominant handshape of the sign INSIDE was taken by the non-dominant hand while articulating the sign WORK).

¹¹ Mantovan, in Branchini and Mantovan (eds.) (2020), Phonology: 3.1.2 Coalescence.

Cliticization is defined as a between-words assimilation process that affects pronouns, whose handshape assimilates to the one of the preceding or following sign (Sandler and Lillo Martin 2006). As to our knowledge, cliticization has not been yet studied in LIS: however, examples of regressive handshape assimilation over a personal pronoun, and progressive handshape assimilation over a determiner (in the specific case, a definite article or a demonstrative adjective) were found in Parini (2017).



I AGREE

‘I agree’

Figure 1.3 – Regressive assimilation of the handshape of the lexical sign over a personal pronoun.
[Image from Parini, 2017: 16]



MOTORBIKE_K IX_K

‘The/that motorbike’

Figure 1.4 – Progressive assimilation of the handshape of a lexical sign over a determiner (‘the/that’). After signing MOTORBIKE, the signer moves the dominant hand to a specific point, while the non-dominant hand remains still. Mouthing of MOTORBIKE (MOTOCICLETTA) ends after the production of IX.
[Image from Parini, 2017: 16]

Movement reduction and extension is defined as an alteration of movement width due to linguistic factors, such as pluralization and deverbalization, and/or to extra-linguistic factors, such as the signer’s emotive state, emphasis, shouting or whispering mode, specific registers used. It may also be motivated by articulation ease and effort reduction.

A phenomenon close to movement reduction is reported in Parini (2017), and referred to as synchronic reduction. Synchronic reduction is defined ‘as a process of movement shortening affecting signs, occurring during the articulation of a sentence’ (Parini 2017). This phenomenon can affect signs in their extension and/or in their repeated movement feature (see below, *repetition loss*).



Figure I.5 – COURTHOUSE elicited in isolation (left) and produced within an elicited sentence (right). Synchronic reduction is acting upon the sign width, noticeably reduced, and the repeated movement feature, changed into non-repeated. [Image from Parini, 2017: 19]

Repetition loss is defined in LIS as synchronic phonological phenomenon in which a sign displaying a repeated movement in isolation optionally loses that feature when it appears in the phonological phrase non-final position (Parini 2017).¹²

1.2 Morphology

Morphology is the linguistic domain concerning language structure as for the principles that govern combination of meaningless units into meaningful units. A morpheme is the minimal unit carrying meaning in a language.

In this section, two aspects of LIS morphology will be addressed: indexical signs and their functions (§ 1.2.1) and verbal morphology (§ 1.2.2).¹³

1.2.1 Indexical signs

Indexical signs, i.e., pointing signs, are used with a variety of functions: for instance, they can be determiners, personal pronouns, possessive pronouns and adjectives, locatives, temporal adverbials. This paragraph will focus on determiners and personal pronouns.

Determiners can be either definite or indefinite: the first group includes definite articles and demonstratives; the second indefinite articles. Definite determiners can be deictic, i.e., referring to an entity present in the extra-linguistic context, or anaphoric, i.e., referring to an entity not present in the extra-linguistic context, but previously mentioned in the discourse.

Definite articles consist in indexical signs pointing towards the entity they refer to. They are characterized by a short, quick, movement, not directed to a specific point of the neutral space, which cannot be subject to path variation. Their use is not obligatory: when produced, they accompany either common and proper nouns, and cannot occur in isolation.

Demonstratives consist in indexical signs pointing towards the entity they refer to, and are characterized by a tense movement directed to a specific point of the neutral space, which can be

¹² Nespor and Sandler (1999) identified, for Israeli Sign Language, a phonological process acting at the phonological phrase level (see Nespor and Vogel, 1986, Prosodic Phonology theory for a definition of phonological phrase) consisting in a loss of reduplication: a sign endowed with a repeated movement feature in its citation form tends to lose that feature, thus becoming a sign with a single movement feature, in signing, when it is not the last sign of the phonological phrase.

¹³ For other morphological aspects, such as compounding and derivation, see Checchetto, Fornasiero, and Santoro, in Branchini and Mantovan (eds.) (2020), Morphology.

subject to path variation. If referred to a plural referent, they display an arched movement articulated on the horizontal plane. Furthermore, demonstratives can be marked for emphasis through movement reduplication. Unlike definite articles, demonstratives are obligatory in their context; furthermore, they can occur in isolation. As for anaphoric demonstratives, the sign glossed as PE, consisting in a pointing sign articulated with a wrist rotation, is commonly used.

Indefinite articles consist in either a G or S handshape sign pointing upwards, with either no movement or a trembling movement, and are articulated in an unmarked location in the neutral space. They are used to introduce a new referent, but their use is not obligatory.

Personal pronouns, used to replace nouns referring to either animate or inanimate entities, consist in pointing signs usually displaying a G handshape. They can show features such as person and number.¹⁴ The person feature is expressed by changing the orientation of the pronoun: the singular first-person pronoun points at the signer's chest; the singular second-person pronoun points at the interlocutor; the singular third-person pronoun points elsewhere from the locations assigned to the signer and the interlocutor. As for number, singular is conveyed by pointing to a specific locus, whereas plural is conveyed by adding a movement feature to the pointing. In particular, plural can be collective or distributive: the former is marked by means of an added straight or circular movement to the singular form of the pronoun, whereas the latter is marked by reduplicated pointings towards different locations. Personal pronouns can be deictic, when they refer to an entity present in the extra-linguistic context, or anaphoric, when they refer to an entity not present in the extra-linguistic context, but previously mentioned in the discourse. Personal pronouns can be omitted (see § 1.3.2, Null arguments).

1.2.2 Verbal morphology

LIS verbs are classified into plain verbs, agreement verbs, and spatial verbs.¹⁵ Plain verbs include both intransitive verbs (e.g., TO CRY) and transitive verbs (e.g., TO EAT) articulated on the body of the signer. Agreement verbs include intransitive verbs (e.g., intransitive use of TO BREAK), transitive verbs (e.g., TO TEACH), and ditransitive verbs (e.g., TO GIVE). Agreement verbs are grouped into: verbs with one point of articulation in the neutral space (e.g., TO GROW); verbs with two points of articulation in the neutral space, connected by path movement (e.g., TO DONATE); verbs with two points of articulation connected by a path movement, of which the starting point is located onto the body of the signer and the ending point, which agrees with an argument of the verb, is located in the neutral space¹⁶ (e.g., TO SAY). Spatial verbs include transitive verbs (e.g., TO GO) and ditransitive verbs (e.g., TO PUT) articulated in the neutral space. Verbal inflectional morphological processes concern agreement, tense, and aspect. Among these, only person agreement and locative agreement will be described below.¹⁷

1.2.2.1 Person agreement

Person agreement can be expressed manually, with modifications of the phonological features of the verb, and non-manually, through non-manual markers. However, verbs are subject to restrictions accordingly to the verbal class they belong to.

¹⁴ Other features that might be displayed are clusivity, case, and logophoricity.

¹⁵ See Pizzuto (in Volterra et al. 1987) for a first classification of LIS verbs.

¹⁶ In inflected form, such as IX₂ SAY₁ ('You tell me'), the ending point might as well coincide with the signer.

¹⁷ For more information on verbal inflection (number markers, reciprocal markers, tense, aspect, modality, negation) in LIS, see Fornasiero, in Branchini and Mantovan (eds.) (2020), Morphology: 3 Verbal inflection.

Plain verbs, being articulated on the body of the signer, cannot be spatially inflected to show overt agreement with their argument(s), either subject or object. Nonetheless, they may optionally make use of non-manual markers, such as a body lean towards the spatial locus associated with the subject, to show subject agreement. As for the non-manual markers used for object agreement, Bertone (2011: 155-156) reports head rotation towards the object. Agreement can be also shown by means of a sign glossed AUX,¹⁸ used to show agreement between subject and object. Finally, classifier predicates whose handshape incorporates the theme, hence shows manual agreement with the object, allow transitive plain verbs to show manual agreement with one of their arguments.

Agreement verbs (intransitive and transitive) with one point of articulation in the neutral space must show manual agreement with the referent assigned the thematic role of patient.

Agreement verbs (transitive and ditransitive) articulated with a path movement in the neutral space display manual agreement by associating the subject with the starting point of the path movement and the (direct or indirect) object with the ending point of the path movement (e.g., TO DONATE), or by doing the opposite (so-called *backward verbs*, such as TO COPY, TO INVITE).¹⁹ Furthermore, in some cases, handshape incorporates one of the arguments, allowing the verb to show manual agreement with three arguments. As for non-manual agreement, subject non-manual agreement, consisting in head tilt and body lean towards the locus associated with the subject, can be used to mark third-person subjects; object non-manual agreement, consisting in eye-gaze directed towards the locus associated with the object, can be used to mark objects.

Agreement verbs (transitive and ditransitive) articulated with a path movement starting on the body of the signer and ending in the neutral space,²⁰ show manual agreement for first-person subjects, but not for second-person and third-person subjects, because of articulatory constraints. As for non-manual agreement, subject non-manual agreement, consisting in head tilt and body lean directed towards the locus associated with the subject, can be used to mark third-person subjects; object non-manual agreement, consisting in eye-gaze and shoulders directed towards the locus associated with the object, can be used to mark objects.

Furthermore, intransitive agreement verbs articulated in the neutral space reveal an interesting distinction: unaccusative agreement verbs *must* display spatial agreement with their argument, which has the thematic role of theme; instead, unergative agreement verbs *can* display spatial agreement with their argument, which has the thematic role of agent. Non-manual marking of subject agreement is not reported for these subgroups of agreement verbs.

1.2.2.2 Locative agreement

Spatial verbs show manual agreement with one or more locative arguments. If a spatial verb does not have a path movement (e.g., TO STAY), it shows manual agreement with the locative argument by its articulation in the locus of the neutral space associated with that locative argument. Instead, if a spatial verb has a path movement (e.g., TO MOVE), it shows manual agreement with the source

¹⁸ AUX is a deictic sign articulated with a path movement from the subject to the object, considered to be an instance of grammaticalization of a pronominal element into an auxiliary. Its usage is not restricted to plain verbs: it can indeed be used with agreement verbs as a reinforcer (Fornasiero, in Branchini and Mantovan (eds.) (2020), Lexicon: 3.3.4 Agreement markers).

¹⁹ Backwards verbs do not change their citation form with a first- or second-person subject, but slightly adjust their path movement, making it end close to the locus of the neutral space associated with the subject, with third-person subjects (Fornasiero, in Branchini and Mantovan (eds.) (2020), Morphology: 3.1.1.1 Subject markers).

²⁰ See footnote 16 above.

locative argument, corresponding with the starting point of the path movement, and with the goal locative argument, corresponding with the ending point of the path movement.²¹ Furthermore, in some cases (e.g., TO PUT) handshape incorporates one of the non-locative arguments, realizing manual agreement.

1.3 Syntax

Syntax is the linguistic domain concerning language structure and the principles governing the combination of words into larger units, namely constituents, clauses, and sentences.

In the following paragraphs, word order (§ 1.3.1), null arguments (§ 1.3.2), declarative sentences (§ 1.3.3) and interrogative sentences, namely, polar interrogatives and constituent interrogatives (§ 1.3.4) will be introduced.²²

1.3.1 Word order

In a sentence, constituents are ordered on the basis of rules specific to the given language considered. Constituents can be arranged into an unmarked order, that corresponds to the basic order of a language, or into a marked order to fulfill specific communicative needs. In order to investigate the unmarked word order, the positioning of a verb and its argument(s) is observed. Furthermore, other verb features, such as its being an irreversible or reversible predicate, are taken into consideration.

As for the number of arguments, LIS has intransitive, transitive, and ditransitive predicates. Intransitive predicates, both unergative and unaccusative, display an unmarked SV (Subject – Verb) order. Transitive predicates display an unmarked SOV (Subject – Object – Verb) order. Along with the the SOV unmarked word order, SVO unmarked word order is also possible, when the object is a ‘heavy’ constituent (e.g., coordinated object DPs). Furthermore, diatopic variation over the unmarked word order is reported: Northern Italy signers tend to prefer VO order, whereas Southern Italy signers tend to prefer OV order (Branchini and Geraci, 2011). Ditransitive predicates display the unmarked order SubjectO_{indirect}O_{direct}V. If the object is a clause, both SVO and OSV orders are attested.²³ As for the (ir)reversible predicate feature, irreversible predicates favor a SOV order, whereas reversible predicated favor the SVO order.

In LIS, arguments can be expressed by a full noun phrase, a pronoun (namely, personal pronoun, demonstrative pronoun, possessive pronoun, and reflexive pronoun), or by a null argument (see § 1.3.2 below), as exemplified in the following sentences.

- (1) CHILD COMPUTER_A BREAK_A.
‘The child breaks the computer.’

(Branchini (2020), Syntax: 2.1.2.3.1 Manual verb agreement)

²¹ A slightly different account is found in Bertone (2011: 163-165). If the sentence features one locative argument, the spatial verb shows agreement with the subject and with the locative argument (e.g., TO GO), or with the object and the locative argument (e.g., TO BRING); on the other hand, if the sentence features two locative arguments, the spatial verb shows agreement with the two locative arguments.

²² The reader is referred to Branchini and Mantovan (eds.) (2020) for a description of other sentence types (imperative, exclamative, negative), coordination, subordination, and other aspects of LIS syntax.

²³ SOV order with a sentential complement is allowed with control sentences (Geraci, Cecchetto, Zucchi 2008).

- (2) wh
IX₂ BUY WHAT?
'What did you buy?'

(Cecchetto (2020), Syntax: 1.2.3 Content interrogatives)

- (3) IX₁ LIKE IX(demonstrative).
'I like that.'

(Branchini (2020), Syntax: 2.1.2.2 Pronouns)

LIS sentences can also feature other elements, such as adverbials, modals, aspectual markers, negations, and auxiliaries. As for adverbials, temporal adverbials are found in sentence-initial position, functioning as tense setters, preceding the subject; instead, locative adverbials and frequency adverbials are found post-verbally. Modals are usually found in a post-verbal position.²⁴ Aspectual markers are expressed either manually or non-manually. The perfective aspect marker, DONE, is placed post-verbally, and it cannot co-occur with sentential negative signs. Its negative counterpart is NOT-YET, equally appearing in the post-verbal position. The aspectual marker TO-BE-DONE, referring to an event bound to happen, is found post-verbally. Both DONE and TO-BE-DONE favor an OV order. Imperfective aspect is expressed with either post-verbal lexical adverbs or manual modification of the verb sign. Habitual aspect is expressed with sentence-initial adverbs. Continuative aspect is expressed with manual modification of the verb sign, accompanied with non-manual markers. Negations are usually placed after the verb, the modal, and the aspectual markers. Nonetheless, negative quantifiers (such as NOBODY) are allowed in the pre-verbal position corresponding to their argument position (i.e., subject position or object position, according to the case). Finally, while the agreement marker AUX is found post-verbally, the causative auxiliary GIVE-AUX can either precede or follow the verb.

1.3.2 Null arguments

In LIS, arguments can be omitted: subject, object, indirect object, and locatives can all undergo omission. Null subjects and null objects are allowed when salient in the discourse. Although possible with both plain and agreement verbs, null arguments are reported to be more likely employed with agreement verbs.

Null arguments can be licensed for both linguistic and extra-linguistic reasons. As for linguistic reasons, in main clauses, a subject (or an object) can be omitted in presence of a discourse antecedent (i.e., a previous mention of that entity in the discourse). In embedded clauses, a subject can be omitted in presence of a sentence-mate antecedent (i.e., a previous mention of that entity within that sentence). Furthermore, also topic phrases and role shift license argument omission.

1.3.3 Declarative sentences

In LIS, declarative sentences can be main clauses, coordinated clauses, subordinate clauses. Declarative sentences are not characterized by specific non-manual markers spreading over the entire clause, unless they are subordinate clauses in sentence-initial position.

²⁴ MUST and WANT may also occur pre-verbally, whereas CAN and BE-ABLE are mostly found in a post-verbal position.

In (4) and (5) below, a main declarative clause and an embedded declarative sentence in sentence-initial position are shown.

- (4) MARIA CHOCOLATE BUY.
'Maria bought chocolate.'

(Cecchetto (2020), Syntax: 1.1 Declaratives)

- (5) re
PIERO BIKE FALL GIANNI TELL.
'Gianni said that Piero fell from the bike.'

(Geraci, Cecchetto, Zucchi 2008: 4)

1.3.4 Interrogative sentences

In LIS, interrogative sentences are classified into polar interrogatives, alternative interrogatives, and constituent interrogatives. In the following paragraphs polar interrogatives and content interrogatives will be addressed.

1.3.4.1 Polar interrogatives

Polar interrogatives are distinguished into direct polar interrogatives and indirect polar interrogatives, the former being main clauses, the latter subordinate clauses. In relation to word order, polar interrogatives can either exhibit: (i) an identical word order to that of declarative sentences; (ii) the presence of a clause-final YES-OR-NO²⁵ sign; or (iii) a clause-final subject pronoun, either with or without the subject pronoun expressed at the beginning of the sentence. As for non-manual markers, direct polar interrogatives are marked by means of raised eyebrows; in addition, head-nod and headshake, along with head and body orientation changes, can occur. On the other hand, no mention is made in relation to the occurrence of non-manual markers in indirect polar interrogatives. Non-manual markers spread over the entire polar interrogative clause, either direct or indirect, with the exception of the ones containing the clause-final YES-OR-NO sign, in which only the clause-final sign is marked. In most cases, polar interrogatives exhibit the same word order as declarative sentences, and are distinguished from them by non-manual markers means only.

For the sake of clarity, a declarative clause and a polar interrogative clause differing for non-manual markers means only are reported in (6) and (7) below.

- (6) IX₃ CINEMA GO.
'He will go to the cinema.'

(Cecchetto (2020), Syntax: 1.2.1 Polar interrogatives)

- (7) polar int.
IX₃ CINEMA GO?
'Will he go to the cinema?'

(Cecchetto (2020), Syntax: 1.2.1 Polar interrogatives)

²⁵ The sign glossed YES-OR-NO could possibly be an interrogative particle in polar interrogatives (Cecchetto, in Branchini and Mantovan (eds.) (2020), Syntax: 1.2.1.3 Interrogative particles).

1.3.4.2 Content interrogatives

Content interrogatives are distinguished into direct content interrogatives and indirect content interrogatives, the former being main clauses, the latter subordinate clauses. Content interrogatives are characterized by the presence of an interrogative sign (e.g., *what, who, which, why, when, where, how*). LIS features a variety of interrogative signs, among which several local variants; in addition, it also makes use of an interrogative sign – glossed $Q_{artichoke}^{26}$ – that encompasses all possible interrogatives, and whose meaning is understood by both its sentence role and its mouthing, corresponding to (part of) the spoken Italian interrogative. In some cases, content interrogatives are produced without the interrogative element (e.g., IX₂ AGE?, ‘How old are you?’). In both direct content interrogatives and indirect content interrogatives, the interrogative sign appears at the end of the clause: however, there are a few exceptions to that. First, both direct and indirect content interrogatives allow for a clause-final subject pronoun repetition (see examples (9) and (10) below); secondly, direct content interrogatives allow for doubling of the interrogative sign. When the interrogative sign is doubled, either the first occurrence of the interrogative sign is in clause-initial position and the second instance of the interrogative sign is in clause-final position, or the two instances appear both at the end of the clause. In this latter case, which belongs to an informal register, the second occurrence can only be $Q_{artichoke}$, over which mouthing spreading from the preceding interrogative sign is observed. In addition, when an interrogative sign is restricted by a noun phrase (e.g., *which car*), either both the restriction and the interrogative sign appear at the end of the clause, or the restriction remains *in situ* and the interrogative sign appears at the end of the clause. As for non-manual markers, content interrogatives are marked by furrowed eyebrows, which are obligatory over the interrogative sign and can spread up to the entire clause, accordingly to the interrogative phrase grammatical role, and namely from the canonical position associated to a given constituent to the end of the sentence. In other terms, when the interrogative phrase grammatical role is subject, non-manual markers can spread from the canonical subject position to the end of the sentence, where the interrogative sign is placed. On the other hand, when the interrogative phrase grammatical role is object, non-manual markers can spread from the canonical object position to the end of the sentence, where the interrogative sign is placed. Finally, LIS does not seem to allow for multiple content interrogatives (e.g., English *Who did what?*).

In the examples below, the reader will find: a direct content interrogative (8), a direct content interrogative with a clause-final pronoun repetition (9), an indirect content interrogative with clause-final pronoun repetition (10), a content interrogative featuring a sentence-initial and a sentence-final interrogative sign (11), and a content interrogative with two interrogative signs occurring in sentence-final position (12).

- (8) ()wh
IX₂ WORK WHERE?
‘Where do you work?’
(Cecchetto (2020), Syntax: 1.2.3.1 Non-manual markers in content interrogatives)

- (9) wh
IX₂ LIVE WHERE IX₂?
‘Where do you live?’
(Cecchetto (2020), Syntax: 1.2.3.5 Position of wh-signs)

²⁶ $Q_{artichoke}$ could possibly be an interrogative particle in content interrogatives (Cecchetto, in Branchini and Mantovan (eds.) (2020), Syntax: 1.2.3.9 Interrogative particles).

- (10) $\text{IX}_3 \text{ } \overline{\text{ASK}}_1 \text{ BUY } \text{IX}_1 \text{ WHAT } \text{IX}_1$.
 ‘He asked me what I bought.’
 (Cecchetto (2020), Syntax: 1.2.3 Content interrogatives)
- (11) $\overline{\text{WHAT}} \text{ YESTERDAY BUY } \overline{\text{WHAT}}?$
 ‘What did you buy yesterday?’
 (Cecchetto (2020), Syntax: 1.2.3.7 Doubling of the wh-sign)
- (12) $\text{IX}_2 \text{ DO WHAT } \overline{\text{Q}_{\text{artichoke}}?}$
 ‘What are you doing? / What did you do?’
 (Cecchetto (2020), Syntax: 1.2.3.7 Doubling of the wh-sign)

1.4 Pragmatics

Pragmatics is the linguistic domain concerning meaning in context. It concerns both linguistic phenomena such as the usage of anaphoric pronouns, and socio-cultural aspects, such as register.

In this section, after a brief introduction to speech acts (§ 1.4.1), information structure (§ 1.4.2) will be addressed.

1.4.1 Speech acts

Language aims at communicating intentions, and it does so through syntactic structures depending on specific communication purposes. For instance, assertions are commonly expressed with declarative clauses, questions with interrogative clauses, requests and commands with imperative clauses. Nonetheless, the same communication purpose can be achieved by using different syntactic structures – as the same syntactic structure can be used to achieve different communication purposes. The same holds true for LIS: while declarative clauses are mostly used for assertions, they can also be used for questions and requests. Similarly, while interrogative clauses are mostly used for questions, they can also be used for assertions and requests.

1.4.2 Information structure

In a sentence, information is structured in relation to linguistic and extra-linguistic context, and in relation to the background knowledge possessed by the interlocutors.

Information can be divided into topic and focus: the former refers to something the addressee already knows (i.e., old information – shared information), whereas the latter refers to something the addressee does not know yet (i.e., new information).

Topic can be further classified into: aboutness topic, scene-setting topic, and contrastive topic. Aboutness topic presents the entity the sentence is about. Scene-setting topic places the sentence in time (scene-setting topic of time) and location (scene-setting topic of location). Finally, contrastive topic is used to oppose two (or more) previously mentioned referents.

Focus can be further classified into: all-new focus, new-information focus, contrastive focus, emphatic focus. All-new focus embraces the entire sentence, when no background information is available or previously provided. New-information focus refers to the part of the sentence conveying new information, when background information is available. Contrastive focus is used to provide a piece of information in opposition to a previously mentioned one, for instance to correct something previously stated. Finally, emphatic focus is used to highlight a referent.

Information structure in LIS displays all the aforementioned kinds of topic and focus, which will be described in the following paragraphs.

1.4.2.1 Topic

In LIS, a sentence can host only one aboutness topic, which is argumental in nature, realized either as a full noun phrase, a pronominal form, or a null form. As for non-manual markers, aboutness topics are most frequently – but not obligatorily – marked with either raised eyebrows, or squinted eyes,²⁷ or both. However, if the aboutness topic is realized with a pronominal form, the most frequent non-manual marker used is head tilt back. As for prosodic cues, eye-blink and/or head-nod can occur to separate the aboutness topic from the rest of the sentence. An example of aboutness topic is provided in (13) below.

- (13) abt
MAN_A IX_A IX₁ 3_A TELL₁ EVERYTHING.
‘The man has told me everything.’

(Calderone (2020), Pragmatics: 4.2 Topic)

On the other hand, a sentence can host one or more scene-setting topic, realized either with a full noun phrase or a pronominal form. Scene-setting topics are not arguments of the sentence verb, but adjuncts, which express temporal and spatial information. As for non-manual markers, scene-setting topics can be marked with either raised eyebrows, or squinted eyes, or both. As for prosodic cues, a pause marked with eye-blink and head-nod can occur to separate the scene-setting topic from the rest of the sentence. An example of a scene-setting topic is provided in (14) below.

- (14) sst-time sst-location abt
YESTERDAY CINEMA IX(locative) M-A-R-I-A FILM WHITE BLACK VARIOUS SEE.
‘Yesterday, at the cinema, Maria saw various black-and-white movies.’

(Calderone (2020), Pragmatics: 4.2 Topic)

Finally, contrastive topics, which are argumental in nature, are used to convey opposition between two pieces of information previously mentioned in the discourse. In LIS, both subject contrastive topics and object contrastive topics are attested. As for non-manual markers, contrastive topics can be marked with raised eyebrows and squinted eyes; in addition, lateral body leans further signal contrast. As for prosodic cues, a pause marked with eye-blink and/or head-nod can occur to separate contrastive topics from the rest of the sentence. An example of contrastive topic is provided in (15) below.

²⁷ Squinted eyes, found more frequently with nominal expressions than with pronouns, are suggested to mark not easily retrievable topics (Calderone, 2020a).

- (15) $\overline{\text{abt}}$ $\overline{\text{ctr1}}$ $\overline{\text{ctr2}}$
 DOG_A IX_A GIANNI_B LOVE_A MARIA_C HATE_A.
 ‘As for the dog, Gianni loves him while Maria hates him.’
 (Calderone (2020), Pragmatics: 4.2 Topic)

In LIS, topics appear to be ordered as follows: temporal scene-setting topic > location scene-setting topic > aboutness topic > contrastive topic.

1.4.2.2 Focus

In LIS, all-new focus extends over the whole sentence, since all its content is new information. As for prosodic cues, optional eye-blink and head-nod at the end of the sentence is reported. Furthermore, the sign in clause-final position can be subject to lengthening. An example of all-new focus is provided in (16) below.

- (16) $\overline{\text{wh}}$
 A: HAPPEN Q_{artichoke}?
 $\overline{\text{foc}}$
 B: GIANNI ACCIDENT DONE.
 A: ‘What happened?’
 B: ‘Gianni had an accident.’
 (Calderone (2020), Pragmatics: 4.1.1 All-new focus)

New-information focus extends over the part of the sentence conveying new information. A specific structure used to express new-information focus is the question-answer pair, in which new-information focus is expressed by the answer. As for background information (i.e., old information), it either precedes new-information focus, or is subject to ellipsis. As for manual markers, focused signs are subject to lengthening and can be articulated with a greater amplitude. As for non-manual markers, focused signs are usually accompanied by mouthing or mouth gestures. An example of new-information focus is provided in (17)-(18) below.

- (17) $\overline{\text{wh}}$
 A: IX₂ BUY Q_{artichoke}?
 $\overline{\text{foc}}$
 B: IX₁ CAR NEW BUY IX₁.
 A: ‘What did you buy?’
 B: ‘I bought a new car.’
 (Calderone (2020), Pragmatics: 4.1.2 New-information focus)

- (18) $\overline{\text{nm}}$ $\overline{\text{foc}}$
 IX₁ FOOD LIKE WHICH PIZZA.
 ‘The kind of food I like is pizza.’
 (Calderone (2020), Pragmatics: 4.1.2 New-information focus)

Contrastive focus extends over the part of the sentence that contains new information correcting a referent previously mentioned. It often appears in sentence-initial position, before background information. Background information can be subject to ellipsis. As for non-manual markers, raised eyebrows, wide eyes, repeated head-nod, mouthing, and body leans are reported to mark the focused signs or the entire sentence. An example of contrastive focus is provided in (19) below.

- (19) A: CAKE LIKE IX₂.
B: IX₁ NOT CHESTNUT PREFER!
A: ‘You do like cakes.’
B: ‘No! I prefer chestnuts.’

(Calderone (2020), Pragmatics: 4.1.3 Contrastive focus)

Emphatic focus is conveyed through the repetition, within the same sentence, of a focused element. It concerns syntactic heads or morphologically simple elements, such as nouns, quantifiers, verbs, modals, negative signs, interrogative signs. As for non-manual markers, wide eyes and forward body lean are reported. An example of emphatic focus is provided in (20) below.

- (20) IX₁ SELF PAY SELF!
‘I have paid for myself!’

(Calderone (2020), Pragmatics: 4.1.4 Emphatic focus)

1.5 Summary

In this chapter, a selection of the basic properties of Italian Sign Language (LIS) were introduced concerning the domain of phonology, morphology, syntax, and pragmatics.

The following chapter is devoted to an overview of indexical signs in clause-final position in LIS and other sign languages, which will serve as a starting point for the remainder of this thesis.

Chapter 2

Indexical signs (IX) in clause-final position in Italian Sign Language and other sign languages

Indexical signs (IX) in clause-final position are attested in several sign languages, among which LIS. Different restrictions appear to be at work across sign languages, and several proposals on the phenomenon have been advanced. In this chapter, an overview of indexical signs in clause-final position in a selection of sign languages (§ 2.1) and in LIS (§ 2.2), along with LIS examples grouped for sentence type, will be provided. A summary (§ 2.3) will close the chapter.

2.1 Indexical signs in clause-final position among sign languages

In recent literature on sign language linguistics, indexical signs (IX) in clause-final position sparked interest, becoming object of research and debate.

A phenomenon known as Subject Pronoun Copy (Padden, 1988, 2017)¹, consisting in the optional presence of a clause-final pronoun referring to the subject of the clause, has been described for ASL² (American Sign Language).

Subject Pronoun Copy

A pronoun copy of subject *i* appears at the end of the clause of which *i* is subject.

(Padden 1988, 2017: 87)

Subject Pronoun Copy is claimed to be used as ‘a confirmation by the speaker’, or ‘to add an emphatic meaning’ (Padden 1988, 2017: 86). In addition, Subject Pronoun Copy in ASL is said to be used as a diagnostic to distinguish between coordinated clauses and embedded clauses. In coordinated structures it is ungrammatical to have a sentence-final indexical sign co-referent with the subject of the first coordinated clause.

- (1) *_{3A}GIVE₁ MONEY, _{3B}GIVE₁ FLOWER IX_{3A}.³
‘He gave me money, but she gave me flowers, he did.’

(Padden 1988, 2017: 87)

- (2) *₁HIT_{3A}, IX_{3A} TATTLE MOTHER IX₁.
‘I hit him and he told his mother, I did.’

(Padden 1988, 2017: 87)

On the other hand, it is possible to have a clause-final indexical sign co-referent with the subject belonging to the same clause in coordinated structures.

¹ Padden (1988, 2017, Chapter 3) is devoted to discussing arguments in favor of the existence of embedded sentences in ASL.

² ASL is a SVO language.

³ The sentences are glossed according to the conventions used in this thesis, thus they slightly differ from the original.

- (3) ${}_{3A}GIVE_1$ MONEY IX_{3A} , ${}_{3B}GIVE_1$ FLOWER IX_{3B} .
 ‘He gave me money, he did, but she gave me flowers, she did.’
 (Padden 1988, 2017: 88)

- (4) ${}_1HIT_{3A}$ IX_1 , IX_{3A} TATTLE MOTHER IX_{3A} .
 ‘I hit him, I did, and he told his mother, he did.’
 (Padden 1988, 2017: 88)

Conversely, in subordinated structures in which the first clause is the main clause and the second clause is the embedded clause it is grammatical to have a sentence-final indexical sign co-referent with the subject of the first clause.⁴

- (5) ${}_1FORCE_{3A}$ MAN ${}_{3A}GIVE_{3B}$ BOY $POSS_{3B}$ BOOK IX_1 .
 ‘I forced the man to give the boy his book, I did.’
 (Padden 1988, 2017: 88)

Another example of Subject Pronoun Copy found in Padden (1988, 2017) concerns a biclausal structure in which the object of the embedded clause is topicalized to sentence-initial position, and in which the sentence-final indexical sign refers to the subject of the main clause.

- top
 (6) $POSS_3$ CAR, ${}_3PERSUADE_1$ BUY IX_3 .
 ‘His car, he persuaded me to buy, he did.’
 (Padden 1988, 2017: 91)

Furthermore, Subject Pronoun Copy is found in a polar interrogative sentence. As can be seen below, the sentence-final indexical sign is co-referent with the subject.

- polar interrogative nmm
 (7) IX_2 ${}_2SEND_1$ INVITATION $IX_2?$
 ‘Did you send me an invitation?’
 (Padden 1988, 2017: 133)

As for non-manual markers occurring over the clause-final indexical sign, or for prosodic cues, no mentions are present in Padden (1988, 2017).

Davidson and Caponigro (2016), in a study on ASL, report that in embedded polar interrogatives the sentence-final indexical sign can refer either to the subject of the main clause or to the subject of the subordinate clause.

- (8) MOM_A REMEMBER BROTHER_B LIKE SALAD $IX_{A/B}$.
 ‘Mom doesn’t remember whether her brother likes salad.’
 (Davidson and Caponigro 2016: 19)

⁴ Padden (1988, 2017) lists the following verbs as the main clause verbs: FORCE, PERSUADE, DECIDE, TELL, ASK, ENCOURAGE, COMMAND. It is not clear whether only verbs belonging to the same category allow for the possibility of having a sentence-final indexical sign co-referent with the subject of the first-position main clause, or if this is possible for any verb.

Furthermore, they report that in sentences displaying doubling,⁵ the copied indexical sign appears after the doubled element, hence in clause-final position, as in the example below.

- (9) IX₁ WILL LEAVE WILL IX₁.
 ‘I will leave.’

(From Petronio 1993, as in Davidson and Caponigro 2016: 176)⁶

According to them, the sentence-final indexical sign is in a more peripheral syntactic position than the one hosting the doubled element. However, since doubled elements can occur in embedded declarative clauses but not in embedded polar sentences,⁷ the position hosting the sentence-final indexical sign is ‘not sensitive to the clause type’ (Davidson and Caponigro 2016: 177).⁸

An equivalent to Subject Pronoun Copy described for ASL was reported for NGT (*Nederlandse Gebarentaal* – Sign Language of the Netherlands) by Bos (1995). Bos claimed that the clause-final indexical sign is referred to – and can only be referred to – the subject of the clause. However, Crasborn et al. (2009), in a study on topic agreement in NGT, claimed that the clause-final indexical sign can be referred to any kind of topic, being it an argument topic (e.g., the subject, the object) or a non-argumental spatio-temporal topic, therefore interpreted the phenomenon as an instance of topic agreement.

Different restrictions are at play in DGS (*Deutsche Gebärdensprache* – German Sign Language). The clause-final indexical sign can be only referred to the subject, whereas it cannot be referred to the object or to other constituents (Loos 2020).⁹

As for manual features, since there are no explicit mentions of the opposite, the clause-final indexical sign is homophonous to the personal pronoun.¹⁰ An exception is present in TİD (*Türk İşaret Dili* – Turkish Sign Language), in which the clause-final indexical sign, claimed to be a pronoun, can be either homophonous to the personal pronoun, in which case it displays a G handshape, or be non-homophonous, in which case it displays a B handshape¹¹ (Özsoy 2020).¹²

As for non-manual features, Crasborn et al. (2009) report, for NGT, the absence of prosodic pauses occurring before the clause-final indexical sign, and of non-manual markers marking the clause-final indexical sign. The same holds true for DGS (Loos 2020).¹³

⁵ In ASL, doubling is defined as ‘the repetition of the matrix verb, the modal, or the negative element at the end of the clause’ (Davidson and Caponigro 2016: 172).

⁶ The same sentence is reported also in the SignGram Blueprint (2017: 399), from Petronio (1993: 134), as follows:

headnod
 IX₁ WILL LEAVE WILL IX₁.

⁷ In ASL, doubling is subject to restrictions. For further information, see Davidson and Caponigro (2016).

⁸ The fact that doubles cannot appear in embedded polar interrogatives, whereas Subject Pronoun Copy can, constitutes further evidence in favor of Subject Pronoun Copy being a distinct phenomenon from doubling.

⁹ Loos, in Proske, Nuhbalaoglu, Herrmann, Hosemann and Steinbach (eds.) (2020), Syntax: 2.2.1.3 Strategies of pronoun copying for subject and object.

¹⁰ To the best of my knowledge, for the above-mentioned sign languages, neither different possible handshapes, nor synchronic phonological phenomena, such as orientation assimilation, are reported.

¹¹ G handshape and B handshape according to LIS coding of handshapes. In TİD terminology, 1-Handshape and Flat-Handshape, respectively.

¹² Özsoy, in Keleşir (ed.) (2020), Syntax: 2.2.1.3 Strategies of pronoun copying for subject and object.

¹³ Loos, in Proske, Nuhbalaoglu, Herrmann, Hosemann and Steinbach (eds.) (2020), Syntax: 2.2.1.3 Strategies of pronoun copying for subject and object.

As for the pragmatic role of the clause-final indexical sign, emphasis is suggested to motivate its presence both in ASL and DGS (for ASL, Padden 1988, 2017: 86; Davidson and Caponigro 2016: 154; for DGS, Grin and Macht 2020).¹⁴

The referent of the indexical sign might be a full noun phrase, a pronoun, or a null subject in ASL (a.o., examples in Padden, 1988, 2017: 86-89), a full noun phrase, a pronoun, or a null phrase in NGT (SignGram Blueprint 2017: 399-400; Crasborn et al. 2009), a full noun phrase or a pronoun in DGS (Loos 2020).¹⁵

2.2 Indexical signs in clause-final position in LIS

Indexical signs (IX) in LIS, as seen in Chapter 1, § 1.2.1, are used with a variety of functions, and can appear in different sentence positions. To the best of our knowledge, indexical signs in clause-final position have not been thoroughly investigated and understood. Nevertheless, they are attested and acknowledged, or just inadvertently reported in examples, throughout the linguistic literature on LIS. In this paragraph, Bertone's (2011) and Branchini and Mantovan's (eds.) (2020) account of indexical signs in clause-final position in LIS will be described.

Bertone (2011) mentions the possibility of a clause-final position indexical sign co-referent with the subject in polar interrogative sentences and in constituent interrogative sentences, as an instance of reduplication of the second-person pronoun in clause-initial position.

(10) IX₂ MONARCHY WANT IX₂?
'Do you want monarchy?'

(11) IX₂ LIVE WHERE IX₂?
'Where do you live?'

(Bertone 2011: 231)

Bertone reports that, while the clause-initial indexical sign can display a repeated movement and can be characterized by the mouthing *tu* ('you'), the clause-final indexical sign cannot have a repeated movement and does not have its own mouthing, but, if mouthing is displayed, it is the one of the preceding sign. As for the linguistic nature of the clause-final indexical sign, Bertone argues that it is either a weak or a clitic pronoun.¹⁶

Nonetheless, the impossibility of a repeated movement for the clause-final indexical sign is not completely ruled out.

¹⁴ Grin and Macht in Proske, Nuhbalaoglu, Herrmann, Hosemann and Steinbach (eds.) (2020), *Syntax*: 1.2.1.2 Word order changes between declaratives and polar interrogatives.

¹⁵ Loos, in Proske, Nuhbalaoglu, Herrmann, Hosemann and Steinbach (eds.) (2020), *Syntax*: 2.2.1.3 Strategies of pronoun copying for subject and object.

¹⁶ Bertone (2007), following Cardinaletti and Starke (1999), divides LIS pronouns into strong pronouns, weak pronouns, and clitic pronouns, based on features such as the length of articulation and the possibility of reduplication. Strong pronouns are prosodically separated by the rest of the sentence through a pause, can have a reduplicated movement, and are articulated for an average time of 500ms; weak pronouns can display co-articulation phenomena, cannot have a reduplicated movement, and are articulated for an average time of 200ms; clitic pronouns can display co-articulation phenomena, cannot have a reduplicated movement, and are articulated for an average time of 83ms.

- (12) PRIME MINISTER IX₃ SIGN IX₃₊.
'The Prime Minister said that.'

(Bertone 2011: 129)

In the example above, both indexical signs are referred to the subject: however, while the first occurrence is classified as a weak pronoun, the second one, due to movement reduplication, is classified as a strong pronoun with a marked interpretation of contrastive focus.

Furthermore, clause-final indexical signs can be found in topicalized sentences, as the one reported below.

- (13) top
MAN_K IX_K WOMAN THINK IX_K.
'The/That man, the/that woman think about him.'

(Bertone 2011: 156)

Bertone (2011) argues that in case of a topicalization, the post-verbal, clause-final indexical sign agreeing with the object is obligatory.

Calderone (2020),¹⁷ defines pronoun copying as the phenomenon by which a pronoun, co-referent with one of the arguments of the clause with whom it shows spatial agreement, occurs in clause-final position.¹⁸ Pronoun copying can occur with either the subject or the object (especially in object fronting, but also in unmarked SOV order), although its occurring is reported as more frequent for subjects than for objects. As for the co-referred argument, it can be realized as a full noun phrase, a pronoun, or a null argument. Pronoun copying appears to be associated with pragmatic functions such as topic (e.g., topic agreement, familiar topic occurrence), focus (e.g., corrective focus), and conveying emphasis. In particular, the copied argument is usually the aboutness topic, i.e., what the sentence is about.

Pronoun copying is reported for declarative sentences, polar interrogative sentences, content interrogative sentences, embedded clauses, whereas it is reported to be unlikely to occur in coordinated structures. In relation to constituent interrogatives, the pronoun copy is reported to seemingly precede the interrogative, which is found at the end of the sentence.¹⁹ Furthermore, as for subject pronoun copy in embedded clauses, a restriction is reported: when the sentence displays the order main clause-subordinate clause, the pronoun at the end of the sentence refers to the subordinate clause subject; instead, when the sentence displays the order subordinate clause-main clause, the pronoun at the end of the sentence refers to the main clause subject. In other words, the subject pronoun copy refers to the subject of the closest clause.²⁰

As for non-manual markers, an optional, light, movement of the body towards the opposite side where the subject is located in neutral space, is reported. Non-manual-markers are not reported for object pronoun copy. As for prosodic cues, no markers are reported.

¹⁷ Calderone, in Branchini and Mantovan (eds.) (2020), *Syntax*: 2.6 Pronoun copying.

¹⁸ Occurrences of mid-sentence pronouns are not considered instances of pronoun copying.

¹⁹ However, a post-wh clause-final indexical sign seems to be also possible, as reported in § 2.2.3 for constituent interrogatives and in § 2.2.4 for embedded constituent interrogatives.

²⁰ This differs from data from Padden (1988, 2017), in which the sentence-final indexical sign refers to the subject of the first-position main clause. See example (5) above in this Chapter.

In the remainder of this chapter, examples of clause-final indexical signs in LIS taken from Branchini and Mantovan (eds.) (2020) will be described, grouped for sentence type.²¹ As can be seen in the following sections, the clause-final indexical sign is reported in declarative clauses, polar interrogative clauses, content interrogative clauses (both direct and indirect), embedded clauses, object topicalized clauses. In particular, the indexical sign is placed: after the verb, after the aspectual marker DONE, after the modal verb, and after the existence predicate, but either before or after the interrogative sign in content interrogative clauses.

2.2.1 Declarative clause

In the following examples, a clause-final indexical sign co-referent with the subject in declarative clauses will be shown, namely after a nominal predicate (14), a verbal predicate (15), a modal verb (16)-(18), and the aspectual marker DONE (19). As for non-manual markers, a repeated headnod occurring over the clause-final indexical sign and the preceding sign is observed, along with mouthing spreading over the clause-final indexical sign from the sign preceding it. Occasionally, eyeblinks are also observed.

- eb eb
'contento'
hn+++
- (14) IX₂ HOSPITAL COME CAN. IX₁ HAPPY IX₁.
 'You can come to visit me at the hospital. I am glad (if you do it).'
- (Fornasiero (2020), Lexicon: 3.3.3.1 Deontic modality)

In (14), a clause-final indexical sign, co-referent with the sentence-initial pronominal subject, occurs after a nominal predicate. Mouthing spreading of *contento* ('happy') over the clause-final indexical sign can be observed. In addition, a repeated headnod is produced over both HAPPY and the clause-final indexical sign. Eyeblinks are present during the articulation of HAPPY and between HAPPY and the clause-final indexical sign.

- 'comprato'
hn+++
- (15) IX₁ NEW CAR BUY IX₁.
 'I bought a new car.'
- (Calderone (2020), Pragmatics: 4.1 Focus)

In (15), a clause-final indexical sign, co-referent with the sentence-initial pronominal subject, occurs after the verb. Mouthing spreading of *comprato* ('bought') over the clause-final indexical sign can be observed. Furthermore, a repeated headnod is produced over BUY and the clause-final indexical sign.

²¹ In the following examples, only relevant non-manual markers will be transcribed. On a side note, most of the non-manual markers here reported are added by the author of the present work, who analyzed the video examples provided in Branchini and Mantovan (eds. (2020)). / All examples, except for (21), (22), and (30), are signed by the same deaf native LIS signer. Some characteristics in non-manual marking may be due to personal variation. One of the aims of the study described in Chapter 3 is to investigate non-manual markers in sentences displaying a clause-final indexical sign, by comparing productions of different deaf native LIS signers.

- ‘capace’
 hn+++
- (16) IX₁ SURF BE-ABLE IX₁.
‘I can surf.’

(Fornasiero (2020), Lexicon: 3.3.3.1 Deontic modality)

In (16), a clause-final indexical sign, co-referent with the sentence-initial pronominal subject, occurs after the modal verb. Mouthing spreading of *capace* (‘can’) over the clause-final indexical sign can be observed. In addition, both BE-ABLE and the clause-final indexical sign are characterized by a repeated headnod.

- ‘voglio’
 hn+++
- (17) IX₁ HOUSE BUY WANT IX₁.
‘I want to buy a house.’

(Fornasiero (2020), Lexicon: 3.3.3.1 Deontic modality)

In (17), a clause-final indexical sign, co-referent with the sentence-initial pronominal subject, occurs after the modal verb. Mouthing spreading of *voglio* (‘want’) over the clause-final indexical sign can be observed. In addition, a repeated headnod spreads over both WANT and the clause-final indexical sign.

- ‘può’
 fe
 hn+++
- (18) SUITCASE POSS₃ IX₁ CONTROL BE-ABLE IX₁.
‘I can watch her luggage.’

(Fornasiero (2020), Lexicon: 3.3.3.1 Deontic modality)

In (18), a clause-final indexical sign, co-referent with the sentence-initial pronominal subject, occurs after the modal verb. Mouthing spreading of *può* (‘can’) over the clause-final indexical sign can be observed. In addition, both BE-ABLE and the clause-final indexical sign are characterized by furrowed eyebrows and a repeated headnod.

- ‘fatto’
 hn+++
- (19) GIANNI_A IX_A REPORT DONE IX_{3A}.
‘Gianni said these words, he did.’

(Calderone (2020), Syntax: 2.6.4 Functions of pronoun copying)

In (19), a clause-final indexical sign, co-referent with the sentence-initial pronominal subject, occurs after the aspectual marker DONE. Mouthing spreading of *fatto* (‘done’) over clause-final indexical sign can be observed. In addition, repeated headnod over the signs DONE and the clause-final indexical sign can be observed.

2.2.2 Polar interrogative clause

In the following examples, a clause-final indexical sign co-referent with the subject in polar interrogative clauses will be shown, namely after a nominal predicate (20), a verbal predicate (21)-(23), and a modal verb (24). As for non-manual markers, mouthing spreading over the clause-final

indexical sign from either the preceding sign or the sign before it is usually observed, but not obligatory.

- 'malato'
polar int.
- (20) SICK IX₂?
'Are you sick?'
- (Cecchetto (2020), Syntax: 1.2.1 Polar interrogatives)

In (20), a clause-final indexical sign, co-referent with a null subject, occurs after the nominal predicate. Mouthing spreading of *malato* ('sick') over the clause-final indexical sign can be observed.

- 'tu pizza vuoi tu'
fe
- (21) IX₂ PIZZA WANT IX₂?
'Do you want pizza?'
- (Cecchetto (2020), Syntax: 1.2.1 Polar interrogatives)

In (21), a clause-final indexical sign, co-referent with the sentence-initial pronominal subject, occurs after the verb. The sentence, in which the signer expresses surprise for the fact that the interlocutor desires *pizza*, is characterized by specific non-manual markers, among which furrowed eyebrows, which differentiate it from a 'typical' polar interrogative. Each sign is accompanied by mouthing: in particular, the clause-final indexical sign displays *tu* ('you') mouthing.

- 'pizza'
polar int.
- (22) PIZZA WANT IX₂?
'Do you want pizza?'
- (Cecchetto (2020), Syntax: 1.2.1 Polar interrogatives)

Mouthing or mouthing spreading is not obligatory: in (22), mouthing of *pizza* ('pizza') can be observed over the sign PIZZA, whereas neither WANT nor the clause-final indexical sign are characterized by mouthing. Also to be noted is the co-referentiality to a sentence-initial null subject.

- 'caffè'
polar int.
- (23) COFFEE WANT IX₂?
'Do you want coffee?'
- (Mantovan (2020), Lexicon: 2.2.3 Mouthing)

Conversely, mouthing spreading does not necessarily spreads from the sign preceding the clause-final indexical sign, but it can spread from non-adjacent signs, as well. As can be seen in (23), mouthing spreading of *caffè* ('coffee') over the whole sentence can be observed.

- 'può'
polar int.
- (24) CAR WHEEL CHANGE BE-ABLE IX₂?
'Can you change the car wheel?'
- (Fornasiero (2020), Lexicon: 3.3.3.1 Deontic modality)

In (24), a clause-final indexical sign, co-referent with a sentence-initial null subject, occurs after the modal verb. Mouthing spreading of *può* ('can') over the clause-final indexical sign can be observed.

2.2.3 Content interrogative clause

- (25) $\frac{\text{IX}_2 \text{ LIVE WHERE IX}_2?}{\text{wh}}$
 'Where do you live?'

(Cecchetto (2020), Syntax: 1.2.3.5 Position of wh-signs)

In the sentence above, the indexical sign co-referent with the sentence-initial pronominal subject occurs after the interrogative sign (WHERE), thus appearing in clause-final position. Furthermore, mouthing spreading of *dove* ('where') over the clause-final indexical sign can be observed.

The indexical sign co-referent with the subject can be also found before the interrogative sign, as in (26) below.

- (26) $\frac{\text{BOOK IX}_2 \text{ WANT IX}_2 \text{ WHICH?}}{\text{wh}}$
 'Which book do you want, you?'

(Calderone (2020), Syntax: 2.6.1 Personal Pronoun copying)

2.2.4 Subordinate clause

Clause-final indexical signs are also found also in complex structures. In sentences made of a main clause and a subordinate clause, the sentence-final indexical sign refers to the subject of the closest clause, which can be the main clause (27), or the subordinate clause (28).

- (27) $\frac{\text{MARIA FRUIT EAT MOST MUST MOTHER}_A \text{ SAY IX}_{3A}}{\text{hn+++}}$
 'My mom said that Maria should eat more fruit, she (my mom).'

(Calderone (2020), Syntax: 2.6.1 Personal Pronoun copying)

- (28) $\frac{\text{FATHER}_A \text{ REMEMBER IX}_B \text{ SISTER}_B \text{ ADVENTURE LIKE IX}_{3B}}{\text{hn+++}}$
 'My father remembers that his sister loves adventures.'

(Calderone (2020), Syntax: 3.2.1 Subject pronoun copy)

In (27), mouthing spreading of *dice* ('say') over the clause-final indexical sign can be observed. In both (27)-(28), a repeated headnod over the clause-final indexical sign is present.

The clause-final indexical sign can also occur within a first-position subordinate clause, as in (29) below, which features a conditional structure.

- ‘vuoi’
conditional
- (29) COMPETITION PARTICIPATE WANT IX₂, REGISTRATION OBLIGATION.
‘If you want to participate in the competition, you have to sign up for it.’
(Fornasiero (2020), Lexicon: 3.3.3.1 Deontic modality)

In (29), the indexical sign occurs at the right edge of the conditional subordinate clause. Furthermore, mouthing spreading of *vuoi* (‘want’) over the subordinate clause-final indexical sign can be observed.

A clause-final indexical sign can occur in sentence-final position in embedded content interrogatives, as shown in (30) below. The clause-final indexical sign is co-referent to the subject of the subordinate clause.

- ‘comprato cosa’
wh
- (30) IX₃ 3ASK₁ BUY IX₁ WHAT IX₁.
‘He asked me what I bought.’
(Cecchetto (2020), Syntax: 1.2.3 Content interrogatives)

In addition, mouthing spreading of *comprato* (‘bought’) over the mid-sentence indexical sign, along with handshape progressive assimilation,²² and mouthing spreading of *cosa* (‘what’) over the clause-final indexical sign, articulated with a B-bent handshape²³ can be observed.

Finally, a clause final indexical sign can occur in adjunct subordinate clauses, as in the following example, in which mouthing spreading of *malato* (‘sick’) over the clause-final indexical sign can be observed.

- ‘malato’
neg
- (31) WEEK-LAST IX₁ MUST COME IX₁ NEG-O REASON SICK IX₁.
‘Last week I should have come, but I did not because I was sick.’
(Cecchetto (2020), Syntax: 1.5.1.1.1 Negative particles)

2.2.5 Topicalized object

A clause-final indexical sign can occur in sentences with a topicalized object.

- ‘odia’
hn+++
- top
- (32) CHOCOLATE_A GIANNI HATE IX_{3A}.
‘As for chocolate, Gianni hates it.’
(Calderone (2020), Syntax: 2.2.1.3 Strategies of pronoun copying for subject and object)

²² IX₁ is articulated with a B-bent handshape instead of a G handshape, using both articulators.

²³ Similarly to the mid-sentence IX₁, the clause-final one is articulated with a B-bent handshape instead of a G handshape, although the preceding sign has a 5 handshape. Note that the non-dominant hand partially articulates the sign along with the dominant hand.

In (32), the clause-final indexical sign is co-referent with the topicalized object appearing in sentence-initial position. Mouthing spreading of *odia* ('hate') over the clause-final indexical sign can be observed. Furthermore, a repeated headnod over the clause-final indexical sign can be observed.

As mentioned earlier in § 2.2, Bertone (2011) claims that a clause-final indexical sign co-referent with the topicalized object is obligatory. Evidence against such claim are found in Branchini and Mantovan (eds.) (2020). In particular, in sentences with a topicalized object, a clause-final indexical sign co-referent with the (pronominal or null) subject²⁴ is also reported. The clause-final indexical sign can feature a single or repeated movement, and can either take the mouthing of the preceding sign, or exhibit its own mouthing.

- (33) $\frac{\text{‘cioccolato’}}{\text{top}} \text{ } \frac{\text{‘vuole’}}{\text{top}}$
 CHOCOLATE_B IX_B WANT IX_{3A}.²⁵
 ‘Chocolate, she wants.’
 (Calderone (2020), Syntax: 2.6.1 Personal Pronoun copying)

- (34) $\frac{\text{top}}{\text{top}}$ $\frac{\text{‘voglio’}}{\text{hn+++}}$
 BOOK_K IX_K(demonstrative) IX₁ BUY WANT IX₁.
 ‘I want to buy this book.’
 (Mantovan (2020), Lexicon: 3.6.1 Definite determiners, as adapted from Brunelli (2011): 56)

- (35) $\frac{\text{‘tessera’}}{\text{top}} \text{ } \frac{\text{‘serve’}}{\text{top}}$
 CARD_K CL(c): ‘card’ IX_K(demonstrative)+ IX₁ NEED IX₁₊.
 ‘This card, I need it.’
 (Calderone (2020), Pragmatics: 1.2.1 Manual marking)

- (36) $\frac{\text{top}}{\text{top}}$ $\frac{\text{‘lui’}}{\text{top}}$
 BOOK_A _{3A}BUY_{3B} IX_{3B+}.
 ‘The book, it was bought by him.’
 (Calderone (2020), Syntax: 2.2.1.1 Specific position(s) for subject and object)

Sentences (33)-(34) contain a clause-final indexical sign displaying a single movement, whereas in sentences (35)-(36) it displays a repeated movement. Mouthing spreading over the clause-final indexical sign is observed in (33)-(35), of *vuole* ('wants'), *voglio* ('want'), *serve* ('need'), respectively, whereas in (36) the clause-final indexical sign is characterized by its own mouthing, *lui* ('him'). Finally, in (34) a repeated headnod over the sign WANT and clause-final indexical sign can be observed.

²⁴ NP subject are also possible in theory. However, no examples are included.

²⁵ The sentence is originally glossed (and translated) with the verb LIKE. However, the mouthing featured in the sentence corresponds to the verb WANT (homophonous to the verb LIKE), hence the modified gloss and translation.

2.3 Summary

In this chapter, an overview of indexical signs in clause-final position as attested in LIS and in a selection of other sign languages was provided.

In LIS, a clause-final indexical sign, optionally present, and co-referent to a constituent within the sentence is described as a pronoun reduplication in Bertone (2011) and as an instance of Pronoun Copying in Branchini and Mantovan (eds.) (2020). The clause-final indexical sign can refer to either the subject or the (direct) object of the clause, albeit being more frequently attested as co-referred to the subject; the constituent it refers to can be expressed by a full noun phrase, a pronoun, or be phonologically null. This kind of clause-final indexical signs is attested in a variety of syntactic structures: declarative clauses, polar interrogative clauses, content interrogative clauses (both direct and indirect), subordinate clauses, sentences with a fronted topicalized object, whereas its occurrence in coordinated structures is reported to be unlikely. In particular, as for subordinate clauses, the clause-final indexical sign is found to be co-referent to the subject of the closest clause, regardless of it being the main one or the subordinate one. As for non-manual markers, an optional movement of the body towards the opposite side associated with the entity co-referred with the clause-final indexical sign, is reported for subjects; conversely, no non-manual markers are reported when the clause-final indexical sign is co-referred with the object. As for prosodic cues, no markers are reported. As for its pragmatic function, the clause-final indexical sign is associated with topic, focus, and emphasis.

In relation to other sign languages, a certain degree of variability is found as for the sentence type in which the optional clause-final indexical sign is reported, as for the constituent it can refer to and its overt realization, as for manual features, as well as for its pragmatic function. For instance, while in NGT the clause-final indexical sign can refer to either the subject, the object, or the non-argumental spatio-temporal topic (Crasborn et al. 2009), in DGS it can only refer to the subject (Loos 2020).²⁶ Furthermore, and in contrast with what mentioned above for LIS, in ASL, the clause-final indexical sign in a subordinate clause can refer to the subject of the sentence-initial, main clause (Padden 1988, 2017). As for the overt realization of the constituent to which the clause-final indexical sign refers to, full noun phrase and pronoun are reported for ASL (Quer et al. 2017), DGS (Loos 2020),²⁷ and NGT (Crasborn et al. 2009), whereas only pronoun is reported for TİD (Özsoy 2020).²⁸ As for the clause-final indexical sign manual features, in TİD is reported that the clause-final indexical sign may display a different handshape than the pointing one used for the subject pronoun, namely a flat-open handshape (Özsoy 2020),²⁹ whilst in the other sign languages here mentioned the clause-final indexical sign is reported to be homophonous to pronoun pointing signs. Finally, as for the clause-final indexical sign pragmatic function, giving emphasis is suggested for ASL (Padden, 1988, 2017; Davidson and Caponigro, 2016) and DGS (Grin and Macht 2020),³⁰ whereas topic agreement is suggested for NGT (Crasborn et al. 2009). It therefore seems that, although different restrictions are at play among sign languages, this phenomenon is tightly related to pragmatics and, ultimately, to specific communication purposes.

The following chapter is devoted to the description of the study on clause-final indexical signs in LIS.

²⁶ Loos, in Proske, Nuhbalaoglu, Herrmann, Hosemann and Steinbach (eds.) (2020), Syntax: 2.2.1.3 Strategies of pronoun copying for subject and object.

²⁷ Ibidem.

²⁸ Özsoy, in Kelepir (ed.) (2020), Syntax: 2.2.1.3 Strategies of pronoun copying for subject and object.

²⁹ Ibidem.

³⁰ Grin and Macht in Proske, Nuhbalaoglu, Herrmann, Hosemann and Steinbach (eds.) (2020), Syntax: 1.2.1.2 Word order changes between declaratives and polar interrogatives.

Chapter 3

A preliminary study on indexical signs in clause-final position in Italian Sign Language

Indexical signs (IX) in LIS, as seen in Chapter 1 § 1.2.1, are used with a variety of functions, and can appear in different sentence positions. Furthermore, as seen in Chapter 2 § 2.2, the presence of indexical signs in clause-final position in LIS is attested in different sentence types, either as a single occurrence in the sentence or as a co-referent sign to the overtly expressed subject or object. The clause-final indexical sign has been interpreted so far as being an instance of Pronoun Copy (Calderone, 2020)¹ and a weak or clitic pronoun (Bertone, 2011: 230-232). In addition, as for pragmatics, it has been advanced that the clause-final indexical sign has topic and focus function, and that it is used for emphasis (Calderone, 2020).² Nonetheless, questions regarding its structural position, and other potential pragmatic functions remain to be explained.

This chapter is devoted to the description of the study conducted on indexical signs in clause-final position in LIS as for its aim (§ 3.1), its structure (§ 3.2), data collection (§ 3.3), informants' profiles (§ 3.4), and collected data (§ 3.5). A summary (§ 3.6) closes the chapter.

3.1 – Aim of the study

This study aims at reaching a better understanding of the syntactic properties and pragmatic functions of clause-final indexical signs in LIS.

First, the examples of clause-final indexical signs reported in Chapter 2 § 2.2 all concern first-, second-, and third-person *singular* subjects (and singular objects in object topicalizations). One aim is to test for the grammaticality of a clause-final indexical sign co-referent with a plural entity, in order to check for possible restrictions based on number. In this study, only third-person³ plural subjects were tested for this condition. As for third-person plural objects, potential asymmetries are to be investigated in future research.

Second, as seen in Chapter 2 § 2.2, clause-final indexical signs are attested in different sentence types. Another aim of this study is to test whether they can *equally* occur in declarative clauses, polar interrogative clauses, and content interrogative clauses. If not, it will be explained whether the underlying reason to the observed asymmetry is structural, thus syntactic in nature, or contextual, therefore pragmatic.

Third, as described in Chapter 2 § 2.2, clause-final indexical signs are reported to occur mostly with subjects.⁴ For this reason, another aim is to test whether the clause-final indexical sign can *equally* be

¹ Calderone, in Branchini and Mantovan (eds.) (2020), Syntax: 2.2.1.3 Strategies of pronoun copy for subject and object; 2.6 Pronoun copying; 3.2.1 Subject pronoun copy.

² Calderone, in Branchini and Mantovan (eds.) (2020), Syntax: 2.6.4 Functions of pronoun copying.

³ Third-person subjects and objects allow for a deictic and an anaphoric use of pronouns, whereas a second-person is intrinsically deictic in nature. Therefore, a third-person was thought to be more appropriate for this study, since informants, in their judgements, could give informative insights over the deictic or anaphoric use of the clause-final indexical sign.

⁴ Calderone, in Branchini and Mantovan (eds.) (2020), Syntax: 2.6.1 Personal pronoun copying.

co-referent with the subject and with the object.⁵ If not, it will be explained whether the found asymmetry is syntactic or pragmatic in nature.

Fourth, another aim is to test whether the clause-final indexical (either co-referent with the subject or with the object) is grammatical with either a full noun phrase or a pronominal antecedent within the sentence. If not, an explanation as for the observed ungrammaticality should be provided.

Fifth, it will be tested whether a clause-final indexical sign can occur with either an intransitive verb or a transitive verb.⁶ If not, reasons explaining the asymmetry will be provided.

3.1.1 Clause-final indexical sign: hypothesis on its syntactic nature

The clause-final indexical sign, as seen in Chapter 2 § 2.2, has been considered an instance of Pronoun Copy⁷ (Calderone, 2020),⁸ and a weak or clitic pronoun (Bertone, 2011: 230-232). Nonetheless, the clause-final indexical sign might have different syntactic functions, despite displaying the same superficial form. Therefore, the following hypotheses are made over the linguistic nature of the clause-final indexical sign, which could be: a) an inflectional verbal morpheme; b) an interrogative morpheme; c) a reinforcer of the entity it refers to; d) an instance of subject-verb inversion.⁹

a) The clause-final indexical sign is an inflectional bound morpheme attached to a verbal root. To test for this hypothesis, it should be verified whether non-verbal signs (such as adverbs or content interrogatives) can be inserted between the verb and the clause-final indexical sign. If they can, it can be safely claimed that – at least in those cases – the clause-final indexical sign *is not* a verbal morpheme. If not, the clause-final indexical sign is potentially an inflectional bound morpheme. If the clause-final indexical sign is an inflectional bound morpheme, no pauses or intonational breaks should be observed. However, if the clause-final indexical sign can equally refer to subjects and objects, it is unlikely for it to be an inflectional verbal morpheme, because it would not reflect a verbal paradigm, unless one wants to speculate that either the verbal paradigm is emerging (whence its instability in overt realization), or that the paradigm can inflect on both subjects and objects, according to reasons to be understood.

b) The clause-final indexical sign is an interrogative morpheme, i.e., a functional head endowed with interrogative features, supposedly base-generated within a functional projection. To test for this hypothesis, it should first be verified whether there is an asymmetry between declarative clauses and interrogative clauses as for the grammaticality of the clause-final indexical sign. If the clause-final indexical sign is allowed *only* in interrogative clauses and not in declarative clauses, it could likely be an interrogative morpheme. If it is allowed in both declarative and interrogative clauses, it should be verified that it has the same function: if it has the same function, it cannot be an interrogative morpheme, since it occurs in declarative sentences, as well; if it does not have the same function, the clause-final indexical sign could be the overt realization of elements different in their syntactic nature, such as a reinforcer in declarative clauses and an interrogative morpheme in interrogative clauses.

⁵ Only subjects and direct objects were tested. Indirect objects and adjuncts are to be investigated in future research.

⁶ Plain verbs, agreement verbs, and spatial verbs, should be all included in future, broader studies. Furthermore, attention should be paid to the verbal argument structure, and to the predicate (non-)reversibility.

⁷ Also in the case in which the subject in the sentence-initial canonical argument position is a null subject.

⁸ Calderone, in Branchini and Mantovan (eds.) (2020), *Syntax: 2.6 Pronoun copy*.

⁹ Object-verb inversion was not tested since LIS allows for both SOV and SVO orders (see Chapter 1 § 1.3.1). A sentence such as YOUNG-GUY BUY IX_{object} may be interpreted as a SVO structure, or, potentially, as a SOV structure in which the object is phonologically covert in its canonical position and co-referred to with a post-verbal indexical sign. The indefiniteness of the question, at present, could not be investigated.

Second, it should be verified that the clause-final indexical sign appears in a unique form, unless one speculates that it is an interrogative morpheme endowed with other features (e.g., subject agreement; object agreement).

c) The clause-final indexical sign could be a reinforcer, with a nominal interpretation, such as ‘that very (referent)’. The clause-final indexical sign could either be an element originally belonging to the DP it refers to, or an element base-generated in the projection hosting it.

d) The clause-final indexical sign is an instance of subject-verb inversion. To test for this hypothesis, it should first be verified whether the subject can equally occur pre-verbally, post-verbally, and both pre-verbally and post-verbally. In either case, the syntactic features (e.g., sentence type) and the surrounding context should be analyzed to explain the reasons underlying the phenomenon.

3.1.2 Clause-final indexical sign: hypotheses on its pragmatic functions

The clause-final indexical sign, as seen in Chapter 2 § 2.2, is claimed to have pragmatic topic and focus functions, and to be used for emphasis (Calderone, 2020).¹⁰

Nonetheless, further potential pragmatic functions of the clause-final indexical sign will be investigated, by analyzing collected data as for input sentences grammaticality judgements *in context*, and any other insight provided by informants.

3.1.3 Clause-final indexical sign: other preliminary considerations

Clause-final indexical signs can be analyzed as for their manual features and for the non-manual markers – if any – accompanying them.

As for manual features, the clause-final indexical sign is reported as being a pointing sign with a G handshape, thus homophonous to pronouns. It occasionally might be produced with a B-bent handshape (see Chapter 2 § 2.2.4, example (30)). It is beyond the scope of this study to investigate the potential non-homophony of the clause-final indexical sign (i.e., the clause-final indexical sign produced with a different handshape with respect to the one displayed by its pronominal antecedent within the sentence). In addition, in Chapter 2 § 2.2, it was observed that the clause-final indexical sign can be produced with a single or repeated movement, for reasons to be ascribed to its pragmatic function. An investigation of the contexts triggering movement reduplication is beyond the scope of this study, therefore not specifically researched for. Furthermore, phonological phenomena such as orientation assimilation might also occur, although this research is not focused on such phenomena, either. Nevertheless, any data concerning manual features worthy of attention will be reported.

As for non-manual features, in Chapter 2 § 2.2, it was reported that an optional, light, movement of the body towards the opposite side where the subject is located is observed for subject pronoun copy, whereas no non-manual markers are observed for object pronoun copy. (Calderone, 2020).¹¹ Nonetheless, in the examples provided in Chapter 2 § 2.2, a head-nod accompanying the clause-final

¹⁰ Calderone, in Branchini and Mantovan (eds.) (2020), Syntax: 2.6.4: Functions of pronoun copying.

¹¹ Calderone, in Branchini and Mantovan (eds.) (2020), Syntax: 2.2.1.3 Strategies of pronoun copying for subject and object.

indexical sign was often reported¹² in declarative clauses. Furthermore, mouthing spreading of the sign(s) preceding the clause-final indexical sign was often observed in declarative clauses, polar interrogative clauses, content interrogative clauses, subordinate clauses, and object topicalizations. However, since almost all the examples provided are produced by the same native signer, it will be checked whether the abovementioned non-manual markers and features are common across signers.

As for prosodic features, in Chapter 2 § 2.2, it was reported that no prosodic cues are observed (Calderone, 2020).¹³ In this study, the analysis of data from the sentence repetition task will help (dis)confirming previous claims.

3.2 – Study structure

A grammaticality judgement task (§ 3.2.1 for a description, and § 3.5.1 for collected data) and a sentence repetition task (§ 3.2.2 for a description, and § 3.5.2 for collected data), with a total of 44 contextualized input sentences,¹⁴ are used in this study. Contexts and input sentences were recorded by a deaf native signer,¹⁵ and shown on screen.

Input sentences are grouped for: sentence type,¹⁶ namely declarative clause, polar interrogative clause, and content interrogative clause; overt realization of verbal arguments (i.e., NP subject, NP object; NP subject, pronominal object; pronominal subject, NP object; pronominal subject, pronominal object); verb typology¹⁷ (i.e., intransitive unergative or transitive). Each group of sentences is paired with a specific context.

As for sentences with an intransitive verb (i.e., TO WORK), declarative clauses (Context A), polar interrogative clauses (Context B), and content interrogative clauses (Context C) are tested. In particular, Contexts A and B feature each: a sentence with a pre-verbal pronominal plural subject (A1, B1); a sentence with a pre-verbal pronominal plural subject and a clause-final indexical sign co-referent with the subject, specified for number features (A2, B2); a sentence with a clause-final indexical sign co-referent with the subject, specified for number features, only (A3, B3); a sentence with a pre-verbal pronominal plural subject and a clause-final indexical sign co-referent with the subject, underspecified for number features (A4, B4); a sentence with a clause-initial indexical sign co-referent with the subject, underspecified for number features and a clause-final indexical sign co-referent with the subject, specified for number features (A5, B5). Context C features: a sentence with

¹² Most of the suprasegmental features of the examples provided in Chapter 2 § 2.2 are added by the author of the present work, by analyzing the video examples provided in Branchini and Mantovan (eds.) (2020).

¹³ Calderone, in Branchini and Mantovan (eds.) (2020), Syntax: 2.6.3 Prosodic features of pronoun copying.

¹⁴ The same 44 sentences were used for the grammaticality judgement task and for the sentence repetition task. See Appendix A and Appendix B for, respectively, the lists of contexts and input sentences used in the tasks.

¹⁵ The signer was asked to sign the input sentences using a plain prosody. One advantage of this practice is the reduced possibility that informants echoed particular intonational contours. However, since informants could involuntarily reproduce the plain prosody, attention is needed – and it would be preferable to be familiar with each signer's signing style. In this study, an unforeseen disadvantage due to this choice was that a clear judgement on register could not be expressed, because the prosodic plainness often prevented informants from being able to associate input sentences with any register.

¹⁶ Only sentences with positive polarity were included. Potential restrictions applying in negative declarative sentences, negative polar interrogatives, and negative content interrogatives are to be researched for. Similarly, potential restrictions applying in subordinated clauses, and other syntactic structures not included in the present study are to be investigated in future research.

¹⁷ In this study, the verb TO WORK (unergative intransitive) and TO BUY (transitive), both articulated in the neutral space, were used in input sentences. Their being articulated in the neutral space – and not on the signer's body – may influence the possibility of having a clause-final indexical sign (both favoring or disfavoring it). For this reason, plain verbs, agreement verbs, spatial verbs, with any kind of argumental structure, should be included in future research.

a pre-verbal pronominal plural subject (C1); a sentence with a preverbal pronominal plural subject and a clause-final indexical sign co-referent with the subject, specified for number features (C2); a sentence with a clause-final indexical sign co-referent with the subject, specified for number features, only (C3); a sentence with a pre-verbal pronominal plural subject and a post-verbal indexical sign co-referent with the subject, specified for number features, placed before the interrogative sign (C4); a sentence with a post-verbal indexical sign co-referent with the subject, specified for number features, placed before the interrogative sign, only (C5).

As for sentences with a transitive verb (i.e., TO BUY), declarative clauses (Contexts D to G), polar interrogative clauses (Contexts H to K), and content interrogative clauses (Context L) are tested with a third-person singular subject and a singular direct object. In particular, for declarative clauses and polar interrogative clauses the following combinations of argument realizations are, respectively, tested for: NP subject and NP object (Contexts D and H); NP subject and pronominal object (Context E and I); pronominal subject and NP object (Contexts F and J); pronominal subject and pronominal object (Contexts G and K). In each group a sentence without any clause-final indexical sign (D1, E1, F1, G1, H1, I1, J1, K1), a sentence with a clause-final indexical sign co-referent with the subject (D2, E2, F2, G2, H2, I2, J2, K2), and a sentence with a clause-final indexical sign co-referent with the object (D3, E3, F3, G3, H3, I3, J3, K3) are included.¹⁸ As for content interrogative clauses, which feature both subject and object realized with a noun phrase, the following sentences are tested for: a sentence without any clause-final indexical sign (L1); a sentence with a clause-final indexical sign co-referent with the subject (L2); a sentence with a clause-final indexical sign co-referent with the object (L3); a sentence with an indexical sign co-referent with the subject, placed before the interrogative sign (L4); a sentence with an indexical sign co-referent with the object, placed before the interrogative sign (L5).

3.2.1 Grammaticality judgement task

In the grammaticality judgement task, informants are shown sentences preceded by a context. The task consists in evaluating whether the input sentence is grammatical, partially grammatical, or ungrammatical. If it is judged either partially grammatical or ungrammatical, informants should provide – if possible – an explanation for the partial or total ungrammaticality (e.g., word order, non-manual markers, conflict between the context and the input sentence, etc.). As explained above (§ 3.2), sentences are grouped: if in a group of input sentences more than one is considered grammatical, the informant has to express their preference – if any. Furthermore, informants are asked to account for meaning, context of usage, and register differences. For an ordered list of contexts and input sentences used, see, respectively, Appendix A and Appendix B.

The aim of this task is to gather a preliminary array of data that can set the foundations for a deeper understanding of the object of study. In fact, although grammatical judgements may show a certain degree of variation, since some signers might be more sensitive to certain linguistic aspects than others, an overall agreement on implicit grammatical rules should reveal itself, and patterns should start to emerge.

¹⁸ For instance, the following sentences belong to the group ‘declarative clause with NP subject and NP object’:

- YOUNG-MAN NEWSPAPER BUY.
- YOUNG-MAN NEWSPAPER BUY IX_{subject}.
- YOUNG-MAN NEWSPAPER BUY IX_{object}.

3.2.2 Sentence repetition task

In the sentence repetition task, informants are shown sentences preceded by a context. The task consists in repeating the input sentence if it is considered grammatical, or in correcting it if it is considered partially grammatical or ungrammatical. The contexts and the target sentences are the same used in the grammaticality judgement task, presented in a different order. Prior to signing, informants have to count to three – signing – to limit as much as possible a prosodic echoing of the input sentence via phonological loop. After counting, they have to rest their arms before signing. After signing the sentence, they have to wait a few seconds before continuing the task. This helps in having a cleaner overall sentence production, isolated from other sentences. For an ordered list of contexts and input sentences used, see, respectively, Appendix A and Appendix B.

The aim of this task is to gather a further array of data that can shed more light on the object of study, specifically on manual features, non-manual features, and prosodic features.

3.3 – Data collection

Data were collected through video-recorded online sessions, one signer at a time. The modality used has intrinsic limitations: first, online connection was subject to network issues, thus the conversation flow was frequently interrupted and either the researcher or the informant had to repeat, which led to a lengthening of the sessions; second, the researcher had no control over the camera recording settings and framing.¹⁹ This impacted on the overall quality of the recordings and, in part, on the analysis of collected sentences. Informants were given instructions on the tasks, and in how to navigate the shared folder built for the study. After watching a context or an input sentence, they could watch it as many times as they needed. In each session, at least two breaks were provided; however, informants could ask for a break in any moment. The language used during the sessions was LIS, being the researcher a fluent LIS signer. Prior to the sessions, informants were provided a detailed informed consent form and a personal questionnaire aimed at collecting general background information and at profiling their linguistic competence in foreign sign languages.

3.4 – Informants' profiles

Four deaf native signers, born in the eighties and in the nineties, one male (informant 01) and three females (informant 02, informant 03, informant 04), who come from and live in different areas of Italy, participated to the study. Active members of the local Deaf Community, they all qualified as LIS teachers and have various teaching experiences: in addition, they all have good to advanced knowledge of International Signs and at least one foreign sign language.²⁰ In addition, the deaf native signer who recorded the input sentences, a male individual (informant 05) whose profile coincides

¹⁹ For instance, a poor framing resulted in signs partially articulated out of frame, or in a difficulty in the analysis of some non-manual markers: therefore, in some – fortunately – rare occurrences, time measurements might not be completely accurate.

²⁰ Information on knowledge and usage of International Signs and other sign languages was collected through a self-evaluation questionnaire that asked about comprehension and production skills. Advanced knowledge and frequent usage of another sign language might result in language contact phenomena. Therefore, this piece of information allows to check any peculiarity in signing, divergent from what expected in the sign language object of study, against the characteristics displayed by the other sign languages used by the informant. Nonetheless, since this is a preliminary study, and since the 'standard' characteristics are still partially to be defined, such a check was not run. In any case, this aspect should be taken into consideration in future research.

with the one of the other informants, kindly accepted to provide grammaticality judgements and feedback on the sentences used for the study yet did not take part to the sentence repetition task.

3.5 - Collected data

In this section, data from the grammaticality judgement task (§ 3.5.1), from the sentence repetition task (§ 3.5.2), and from further collected sentences (§ 3.5.3) will be described. For a comparison between grammaticality judgements collected in the grammaticality judgement task and in the sentence repetition task, see Appendix D.

3.5.1 Data – Grammaticality judgement task

In this section, data from the grammaticality judgement task will be described, ordered for given context and input sentence. Grammaticality judgements and feedback²¹ from the native signer who recorded the input sentences (informant 05) will also be reported.

As for register, in most cases informants made reference to sentences being ‘clean’, rather than ‘formal’. The adjective used might thus refer more to the concept of normative grammar than to the one of formal register. In addition, one informant stated that it was not possible to give feedback on register due to the plain prosody of the input sentences. Furthermore, opposite evaluations were given: whereas most of the judgements referred to sentences without the indexical signs as formal, one informant perceived the ones with indexical signs as more formal, probably because the ‘repetition’, in clarifying the meaning, or in being redundant, was associated to a formal register. Therefore, being these judgements scarce in number and overlapping the concepts of ‘formal’ and ‘normative’, they will not be reported.

3.5.1.1 Declarative clause with intransitive verb (Context A)

Context A

YESTERDAY WORKER_K AREA_K STRIKE, INSTEAD TODAY –²²

‘Yesterday workers struck, instead today –’

Input sentence A1

IX_{3P} WORK.

‘They work.’

Informants 01, 02, 03, 04, 05 all considered the sentence grammatical. In addition, informant 04 reported that, with the context given, the most natural production would be WORK, i.e., a sentence

²¹ The deaf native signer kindly accepted to provide grammaticality judgements and feedback on the sentences he previously recorded, after about two weeks from the recording session. In particular, he was asked to provide a grammaticality judgement, and, if the sentence was deemed partially grammatical or ungrammatical, to explain why. He was further asked to note any other comment he had about the input sentences. He was not specifically asked for preferences, nor for meaning, context of usage, or register differences.

²² AREA is a sign used to pluralize a referent or to define a group of people. It is manually homophonous to the sign AREA/PLACE, but lacks mouthing. It usually displays mouthing spreading of the noun it refers to, whose sign it follows. It was chosen to use AREA to avoid the usage of an indexical sign in the context sentence, so that the first instance of the indexical sign was in the input sentence.

with a null subject. The presence of the pronominal subject was considered strict, to the point that the informant said that she would produce it in a teaching setting, but not in spontaneous signing.

Input sentence A2

IX_{3P} WORK IX_{3P}.

‘They work.’

Informant 01 rejected the sentence because of the clause-final indexical sign. Informant 02 considered the sentence grammatical, reporting it being common among signers, and adding that the clause-final indexical sign is used to highlight the subject. Informant 03 accepted the sentence *per se*, but deemed it as ‘heavy’. Informant 04 rejected the sentence because of the clause-final indexical sign, adding that the clause-initial one is sufficient. Informant 05 considered the sentence partially grammatical, namely acceptable *per se*, but clashing with the context given, without providing further comments.

Input sentence A3

WORK IX_{3P}.

‘They work.’

Informant 01 judged the sentence partially grammatical, considering it less clear than A1. He further added that signers with a low competence could struggle in understanding the sentence, whereas signers with a high competence would not. Informant 02 rejected the sentence, stating that the subject must be signed first. In addition, a clash between the structure of the context sentence (Subject – Verb) and the structure of the input sentence (Verb – Subject) was reported. Informant 03 judged the sentence grammatical, and added that the preference between A1 and A3 is a matter of personal signing style. In this regard, she said that she would more spontaneously produce A1 than A3: however, at the same time, she stated that A3 could be the most natural in signing, hinting at the fact that her judgement could be a consequence of a daily contact with Italian. Informant 04 judged the sentence grammatical, and considered it typical in a conversation between deaf signers. Informant 05 deemed the sentence ungrammatical, and considered it not clear with the context given.

Input sentence A4

IX_{3P} WORK IX.

‘They work.’

Informant 01 judged the sentence ungrammatical because of the clause-final indexical sign. Informant 02 rejected the sentence if the clause-final indexical sign is meant to be co-referent with the subject, but accepted it if the clause-final indexical sign is to be interpreted as a locative (i.e., ‘They work there.’). Informant 03 rejected the sentence if the clause-final indexical sign is meant to be co-referent with the subject, and accepted it if the clause-final indexical sign is to be interpreted as a locative (i.e., ‘They work there.’), or as a demonstrative related to WORK interpreted as a noun (i.e., ‘They do that work.’). Informant 04 deemed the sentence ungrammatical because of the clause-final indexical sign. Informant 05 rejected the sentence because of the clause-final indexical sign, considered unintelligible.

Input sentence A5

IX WORK IX_{3P}.

‘They work.’

Informant 01 considered the sentence partially grammatical, interpreting the clause-initial indexical sign as a locative (i.e., ‘They work there.’). Informant 02 deemed the sentence ungrammatical. Informant 03 rejected the sentence, as well. Informant 04 judged the sentence ungrammatical because

of the doubled presence of the indexical sign.²³ Informant 05 deemed the sentence ungrammatical because of the clause-initial indexical sign, considered unintelligible.

In Context A group, informants 02 and 03 expressed preference for A1.

3.5.1.2 Polar interrogative clause with intransitive verb (Context B)

Context B

YESTERDAY WORKER_K AREA_K STRIKE. BUT TODAY?

‘Yesterday workers struck. But, today?’

Input sentence B1

IX_{3P} WORK?

‘Do they work?’

Informants 01, 02, 03, 04 judged the sentence grammatical. Informant 05 considered the sentence partially grammatical, although understandable, adding that WORK IX_{3P}? would be the correct structure.

Input sentence B2

IX_{3P} WORK IX_{3P}?

‘Do they work?’

Informant 01 considered the sentence partially grammatical because of an ambiguous interpretation between a verbal reading and a nominal reading of the sign WORK. Informant 02 judged the sentence grammatical, remarking that the clause-final indexical sign is more common in interrogatives than in declaratives. She further added that such a structure is used to highlight the subject. The repeated presence of the indexical sign is however deemed as unnecessary. Informant 03 considered the sentence grammatical. She added that it is used to highlight and emphasize, however deemed it as ‘heavy’. Informant 04 judged the sentence grammatical, spontaneously commenting upon the fact that this structure is grammatical in an interrogative clause, whereas it is ungrammatical in a declarative clause. She further added that the input sentence is perceived as a typical structure used in LIS teaching settings. Informant 05 judged the sentence grammatical, further stating that the doubled indexical sign reinforces the subject.

Input sentence B3

WORK IX_{3P}?

‘Do they work?’

Informant 01 judged the sentence grammatical. In particular, in a comparison between B1 and B3, he stated that while B1 is a ‘genuine’ question (i.e., the signer does not know whether they work or not), B3 is more of an assertion (i.e., the signer already knows something about them / them working).²⁴ Informant 02 considered the sentence grammatical, but added that a pre-verbal subject would be preferable over a post-verbal one. Informant 03 judged the sentence grammatical, and added that the usage of B1 or B3 depends on the signer’s preferences. Informant 04 considered the sentence grammatical. Informant 05 judged the sentence grammatical.

²³ The two indexical signs were perceived as identical.

²⁴ The probable function is that of asking for confirmation.

Input sentence B4
IX_{3P} WORK IX?
'Do they work?'

Informant 01 deemed the sentence partially grammatical, without providing further feedback. Informant 02 rejected the sentence if the clause-final indexical sign is meant to be co-referent with the subject, and accepted it if it is to be interpreted as a locative (i.e., 'Do they work there?'). Informant 03 deemed the sentence ungrammatical if the clause-final indexical sign is intended to be as co-referent with the subject, and grammatical if the clause-final indexical sign is, for instance, a locative (i.e., 'Do they work there?'). Informant 04 judged the sentence ungrammatical. Informant 05 deemed the sentence ungrammatical because the meaning of the clause-final indexical sign cannot be understood.

Input sentence B5
IX WORK IX_{3P}?
'Do they work?'

Informant 01 judged the sentence ungrammatical, without providing further comments. Informant 02 rejected the sentence if the clause-initial indexical sign is to be referred to the subject, but accepted it if the clause-initial indexical sign is to be interpreted as a locative (i.e., 'Do they work there?'). Informant 03 rejected the sentence without providing further comments. Informant 04 deemed the sentence ungrammatical, adding that it is even worse than B4 because its production requires more articulatory effort. Informant 05 rejected the sentence because the meaning of the clause-initial indexical sign cannot be understood.

In Context B group, informants 01 and 04 prefer B3, whereas informants 02 and 03 prefer B1.

3.5.1.3 Content interrogative clause with intransitive verb (Context C)

Context C

BANK STREET_A ROME_A, OFFICE-WORKER_K AREA_K, STREET_B MILAN_B CHANGE
AMOVE_B. IX_{3P} CONTRACT CHANGE+++ , TIME SLOT, WEEK DATE CHANGE+++ . IX₁
UNDERSTAND NOTHING. IX₂ SITUATION KNOW WELL –

'The office workers of the bank (office) in Rome Street were moved to (the bank office in) Milan Street. Their contract completely changed: their working hours and working days changed. I did not understand anything (about it). You know the situation well –

Input sentence C1
IX_{3P} WORK WHEN?
'When do they work?'

Informants 01, 02, 03, 04, 05 all judged the sentence grammatical.

Input sentence C2
IX_{3P} WORK WHEN IX_{3P}?
'When do they work?'

Informant 01 considered the sentence grammatical, but expressed dislike because of the indexical sign repetition. In addition, he stated that such a structure may be used either by a signer who wants to be particularly clear in their production, or by a signer that does not have a high linguistic

competence.²⁵ Informant 02 judged the sentence grammatical and reported it being frequently used, but considered it less correct than C1, further adding that the production of the clause-final indexical sign could be avoided. Informant 03 considered the sentence grammatical, but considered it less correct than C1. She further suggested that the clause-final indexical sign, which is referred to as a ‘slipped sign’, might have a reinforcing function. Informant 04 rejected the sentence because of the clause-final indexical sign after the interrogative sign. Informant 05 considered the sentence partially grammatical, and signaled a reinforcing function of the clause-final indexical sign.

Input sentence C3

WORK WHEN IX_{3P}?

‘When do they work?’

Informant 01 judged the sentence grammatical. Informant 02 considered the sentence grammatical. Informant 03 rejected the sentence because of the clause-final indexical sign after the interrogative sign. She explained that she is used to having the interrogative sign at the end of the clause, and that while it is possible to have a clause-final indexical sign with a reinforcing meaning when the subject is present in the sentence (i.e., C2), it is not possible to have a clause-final indexical sign alone as the subject (C3). Informant 04 deemed the sentence ungrammatical because of the clause-final indexical sign after the interrogative sign. Informant 05 considered the sentence partially grammatical, reporting that some signers use this structure, with a possible intention of giving prominence to the subject.

Input sentence C4

IX_{3P} WORK IX_{3P} WHEN?

‘When do they work?’

Informant 01 considered the sentence grammatical, adding that while many signers use this structure, he personally does not use it. Informant 02 rejected the sentence because of the proximity of the two occurrences of indexical signs: while C2 is acceptable because the two indexical signs are sufficiently distant one from another, C4 is not. Informant 03 deemed the sentence ungrammatical, although allowing for the possibility that some signers might use it. Informant 04 judged the sentence grammatical. Informant 05 rejected the sentence because of the indexical signs compresence, judged ‘heavy’.

Input sentence C5

WORK IX_{3P} WHEN?

‘When do they work?’

Informant 01 judged the sentence grammatical. Informant 02 considered the sentence grammatical, and reported a meaning difference: while C1 is focused on ‘people’, C5 is focused on ‘work’. In fact, the specific sign order used, different from the canonical Subject – Verb order for intransitive verbs, allows for a nominal interpretation of WORK (i.e., ‘When do they do that work?’). Informant 03 considered the sentence grammatical and added that C1 and C5 do not differ in meaning. Informant 04 judged the sentence grammatical. Informant 05 considered the sentence partially grammatical, being it less clear than C1.

²⁵ This insight is particularly interesting, since it is hinting at an instance of hypercorrection from non-native signers, especially given the fact that the same informant considered grammatical both C1 and C3.

In context C group, informant 01 expressed preference for C1 and C3, adding that while C1 might be used in a teaching setting, C3 might be used in a conversation with friends. Informant 02 preferred C1. Informant 04 preferred C5, which she felt as more spontaneous and comfortable.

3.5.1.4 Intermediate summary: sentences with an intransitive verb

Declarative clauses (Context A), polar interrogative clauses (Context B), and content interrogative clauses (Context C) were tested with an intransitive verb articulated in the neutral space (TO WORK). Although, as expected, informants expressed different grammaticality judgements, some considerations can be made.

First, one of the aims of this study was to test whether the clause-final indexical sign could be underspecified for number features. As it was seen, a clause-final indexical sign underspecified for number features cannot be co-referent with a plural subject, in both declarative clauses and polar interrogative clauses (input sentences A4 and B4, respectively). Furthermore, it was tested whether the indexical sign underspecified for number features could be grammatical in clause-initial position. In this case, as well, it was seen that it cannot be co-referent with a plural subject, in both declarative clauses and polar interrogative clauses (input sentences A5 and B5, respectively).²⁶ In some cases, the underspecified indexical sign was interpreted as a locative.

Second, although it is not clear-cut, a tendency towards an asymmetry between declarative clauses and polar interrogative clauses can be observed. For both sentences with the indexical sign co-referent with the subject in both clause-initial and clause-final position (sentences A2 and B2), and sentences with the indexical sign co-referent with the subject in clause-final position only (sentences A3 and B3), a wider grammatical acceptability was expressed for polar interrogative sentences. This might be due to the different sentence type, with polar interrogative clauses favoring the presence of a clause-final indexical sign co-referent with the subject. However, attention should be paid also to contextual factors: for instance, while the polar interrogative input sentence constituted a sentence on its own, the declarative input sentence was *de facto* the continuation of the context,²⁷ which could have partially influenced grammaticality judgements.

Finally, the grammaticality judgements on content interrogatives do not show clear patterns. A clause-final indexical sign co-referent with the subject, thus occurring after the interrogative sign, received a split result, regardless of the fact that it was the only indexical sign in the sentence or not (C3 and C2, respectively): some signers allow for it, whereas others totally reject it. On the other hand, an indexical sign co-referent with the subject placed before the interrogative sign is accepted to a high degree only if it is the only indexical sign occurring in the sentence (C5 is more accepted than C4). Nonetheless, it is important to observe that an indexical sign placed after the interrogative sign is not completely ungrammatical.

Table III.1, in the following page, shows the grammaticality judgements for declarative clauses, polar interrogative clauses, and content interrogative clauses with an intransitive verb (Contexts A to C).

²⁶ Content interrogative sentences were not tested for this condition.

²⁷ 'Yesterday workers struck, instead today they worked.' versus 'Yesterday workers struck, but what about today? Did they work?'

Intransitive verb ²⁸															
Informant	Declarative					Polar interrogative					Content interrogative				
	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5
01	G	NG	PG	NG	NG	G	PG	G ^p	PG	NG	G ^p	G ^b	G ^p	G ^b	G
02	G ^p	G	NG	NG	NG	G ^p	G ^b	G ^b	NG	NG	G ^p	G ^b	G	NG	G
03	G ^p	G ^b	G	NG	NG	G ^p	G ^b	G	NG	NG	G	G ^b	NG	NG	G
04	G	NG	G	NG	NG	G	G	G ^p	NG	NG	G	NG	NG	G	G ^p
05	G ^b	PG ^a	NG	NG	NG	PG	G	G	NG	NG	G	PG	PG	NG	PG

Table III.1 – Grammaticality judgements for declarative clauses (A1 to A5), polar interrogative clauses (B1 to B5), and content interrogative clauses (C1 to C5) with an intransitive verb (TO WORK).

In the table, G stands for ‘grammatical’, PG for ‘partially grammatical’, and NG for ‘not grammatical’. Sentences accepted with a meaning different from the target one are also labeled ungrammatical (NG).

3.5.1.5 Declarative clause with transitive verb, NP subject, NP object (Context D)

Context D

IX₁ USUAL PLACE NEWSPAPER SELL IX₁ GO+++ . TODAY MORNING IX₁ GO SEE CL(G-G): ‘two people’ MOTHER, CHILD, YOUNG, SHY, NEWSPAPER CHOOSE ABLE-TO NOT. AT-THE-END -

‘I am used to going to the newsstand. This morning I went (there), and I saw a mother and her child, who was young and shy, and was not able to choose a newspaper. At the end –’

Input sentence D1

YOUNG-GUY²⁹ NEWSPAPER BUY.

‘The young guy bought the newspaper.’

Informant 01 considered the sentence grammatical, and suggested that, with the context given, the sign CHILD would be preferred instead of YOUNG-GUY. Informant 02 judged the sentence grammatical. Informant 03 judged the sentence grammatical, adding that it refers to a general newspaper. Informant 04 rejected the sentence with the context given, because the sign YOUNG-GUY is reported to make it unnatural; furthermore, she added that she would probably produce a SVO structure. Nonetheless, the sentence was accepted *per se*. Informant 05 judged the sentence grammatical.

Input sentence D2

YOUNG-GUY NEWSPAPER BUY IX_{subject}.

‘The young guy bought the newspaper.’

Informant 01 considered the sentence grammatical: however, while explaining, the clause-final indexical sign was directed towards a different signing locus than the one associated with the subject.

²⁸ Superscripts a, b, p have the following meanings:

^a The structure is grammatical *per se* or in other contexts.

^b The structure is accepted yet disliked.

^p The structure is the preferred one amongst the ones considered grammatical.

²⁹ The sign YOUNG-PERSON can be used for both females and males. Since the mouthing used in the input sentences – and by the informants – is either unexpressed on the sign and on the pronouns that refer to it, or is at the masculine form, the sign has been glossed directly as YOUNG-GUY.

Therefore, the meaning should be intended as ‘The young guy bought the newspaper *there*’.³⁰ Informant 02 rejected the sentence if the clause-final indexical sign is to be referred to the subject, and accepted it if it is a locative (i.e., ‘The young guy bought the newspaper *there*’). Informant 03 considered the sentence partially grammatical because of the clause-final indexical sign referred to the subject. Informant 04 judged the sentence ungrammatical because of the clause-final indexical sign referred to the subject, adding that ‘the two signs are too far’. Informant 05 judged the sentence grammatical, adding that the clause-final indexical sign is used to highlight the fact that it was the child, and not his mother, to buy the newspaper (i.e., contrastive topic).

Input sentence D3

YOUNG-GUY NEWSPAPER BUY IX_{object}.

‘The young guy bought the newspaper.’

Informant 01 considered the sentence grammatical, although he would not use it. He added that IX_{object} specifies *which newspaper*. Informant 02 deemed the sentence partially grammatical, due to a possible interpretative ambiguity of the clause-final indexical sign. In particular, if the clause-final indexical sign is to be understood as a locative, the sentence is grammatical; instead, if the clause-final indexical sign is referred to the newspaper, the use of PE, which would identify a specific newspaper, would be preferred. Informant 03 considered the sentence grammatical, and explained that the clause-final indexical sign could be interpreted as a locative, if agreeing with the signing locus associated with NEWSSTAND, or as referring to the object. In the latter case, the object is a specific newspaper already mentioned in the discourse. Informant 04 judged the sentence grammatical, adding that the clause-final indexical sign highlights the object. Informant 05 judged the sentence partially grammatical. He further added the clause-final indexical sign is referred to a specific newspaper that has to be mentioned previously in the discourse, otherwise the sentence becomes ungrammatical.³¹

In Context D group, informants 01 and 04 expressed preference for D1.

3.5.1.6 Declarative clause with transitive verb, NP subject, pronominal object (Context E)

Context E

PLACE NEWSPAPER SELL NEWSPAPER LAST THERE-IS.

‘At the newsstand, there is the last newspaper.’

Input sentence E1

YOUNG-GUY IX_{object} BUY.

‘The young guy buys it.’

Informants 01, 02, 03 judged the sentence grammatical. Informant 04 considered the sentence grammatical *per se*, but deemed it partially grammatical with the context given, because of a clash between the context and the input sentence, which results unnatural. Informant 05 considered the sentence grammatical.

Input sentence E2

YOUNG-GUY IX_{object} BUY IX_{subject}.

‘The young guy buys it.’

³⁰ D2 is thus inferred to be considered ungrammatical when the clause-final indexical sign is co-referent with the subject.

³¹ The partial ungrammaticality is explained with the absence, in the context given, of the mention of a specific newspaper.

Informant 01 considered the sentence grammatical, while stating it not being the best option possible due to the clause-final indexical sign. Informant 02 accepted the sentence, while stating it not being the best option possible due to the multiple indexical signs present. Informant 03 considered the sentence partially grammatical because of the clause-final indexical sign, regardless of the context. Informant 04 rejected the sentence because of the clause-final indexical sign. Informant 05 deemed the sentence partially grammatical, adding that it might be used to highlight the subject.

Input sentence E3

YOUNG-GUY IX_{object} BUY IX_{object}.

‘The young guy buys it.’

Informant 01 judged the sentence grammatical, adding that the clause-final indexical sign highlights a specific (*that*) newspaper. Informant 02 considered the sentence grammatical, with a twist: the first indexical sign is referred to the subject, and the second one to the object. This might be due to the input sentence prosody, and to the mouthing spreading of *ragazzo* (‘young guy’) over the following indexical sign (the sentence would then mean: ‘That young guy buys it’). Informant 03 considered the sentence grammatical. She added that the clause-final indexical sign, co-referent with the object, has a reinforcing function. Furthermore, she reported that the newspaper needs to be already mentioned in the discourse. As a final remark, she stated that E1 and E3 do not differ in meaning, because in the context given there is only one copy of the newspaper. Informant 04 considered the sentence grammatical, although personally dispreferred, and added that the clause-final indexical sign gives emphasis. Informant 05 considered the sentence ungrammatical: the clause-final indexical sign is considered ‘heavy’. In addition, he stated that the object must be mentioned previously in the discourse.

In Context E group, informants 01, 02, 03, 04 expressed preference for E1.

3.5.1.7 Declarative clause with transitive verb, pronominal subject, NP object (Context F)

Context F

M-A-R-C-O IX₃ AGE 18. IX₃ INTELLIGENT CULTURED. IX₃ POLITICS LOVE. MORNING+++ IX₃ PLACE NEWSPAPER SELL GO.

‘Marco is eighteen years old. He is intelligent and cultured. He loves politics. Every morning he goes to the newsstand.’

Input sentence F1

IX₃ NEWSPAPER BUY.

‘He buys the newspaper.’

Informants 01, 02, 03, 04, 05 all judged the sentence grammatical. In addition, informant 03 stated that it refers to a general newspaper.

Input sentence F2

IX₃ NEWSPAPER BUY IX_{subject}.

‘He buys the newspaper.’

Informant 01 rejected the sentence. Informant 02 judged the sentence grammatical. Informant 03 considered the sentence partially grammatical because of the clause-final indexical sign. Informant 04 rejected the sentence because of the clause-final indexical sign. Informant 05 considered the

sentence grammatical, adding that the clause-final indexical sign has a reinforcing function, although not necessary in the given context, since there is only one relevant subject.

Input sentence F3

IX₃ NEWSPAPER BUY IX_{object}.

‘He buys the newspaper.’

Informant 01 considered the sentence grammatical, adding that the clause-final indexical sign specifies the type of newspaper. Nonetheless, with the context given, the implied meaning is that a politics newspaper is bought, since the subject is stated having a passion for politics; the clause-final indexical sign co-referent with the object is thus not necessary, and is perceived as uselessly redundant. Informant 02 judged the sentence grammatical, and added that it is focused on a specific newspaper. Informant 03 considered the sentence grammatical, adding that it refers to a specific newspaper. Informant 04 judged the sentence grammatical and stated that it is more specific on the kind of newspaper bought, even if its meaning does not differ from F1. Informant 05 deemed the sentence partially grammatical because there is not any previous mention of a specific newspaper.

In Context F group, informants 01 and 02 preferred F1, whereas informant 04 preferred F3.

3.5.1.8 Declarative clause with transitive verb, pronominal subject, pronominal object (Context G)

Context G

PLACE NEWSPAPER BUY FRIEND POSS₂ GO. NEWSPAPER CL(B): ‘newspapers on the counter’ LOOK-AT-THEM.

‘Your friend goes to the newsstand. He looks at the newspapers on the counter.’

Sentence G1

IX₃ IX_{object} BUY.

‘He buys it.’

Informants 01, 02, 03, 04, 05 all considered the sentence grammatical. Informant 03 added that the sentence refers to a general newspaper.

Sentence G2

IX₃ IX_{object} BUY IX_{subject}.

‘He buys it.’

Informant 01 accepted the sentence grammatical, but expressed dislike and stated his not using it because of the clause-final indexical sign. Informant 02 rejected the sentence for the presence of too many indexical signs, without specifying which one(s) leads to ungrammaticality. Informant 03 considered the sentence partially grammatical for both the clause-final indexical sign and the too many indexicals in the sentence. She added that the structure is ‘heavy’, and that she would not spontaneously produce it. Informant 04 rejected the sentence because of the clause-final indexical sign. Informant 05 deemed the sentence partially grammatical because of the clause-final indexical sign, considered unnecessary.

Sentence G3

IX₃ IX_{object} BUY IX_{object}.

‘He buys it.’

Informant 01 accepted the sentence grammatical, although dispreferred to G1, and stated that with an appropriate context he might use it. Informant 02 considered the sentence grammatical, and added that having two consecutive indexicals on the object is acceptable.³² Furthermore, she stated that the clause-final indexical sign might be interpreted as co-referent to the object or as a locative. Informant 03 judged the sentence grammatical, however adding that it is ‘heavy’ and she would not spontaneously sign it. She also stated that the sentence refers to a specific newspaper, previously mentioned in the discourse. Furthermore, she stated that the clause-final indexical has a reinforcing function. Informant 04 accepted the sentence, but stated that there are many indexicals, which results in an extremely emphatic sentence. Informant 05 rejected the sentence because of the clause-final indexical sign.

In Context G group, informants 01, 02, 03, 04 expressed preference for G1.

3.5.1.9 Intermediate summary: declarative clauses with a transitive verb

Declarative clauses with a transitive verb articulated in the neutral space (TO BUY) were tested in four different conditions: subject and object expressed with a noun phrase (Context D); subject expressed with a noun phrase and object expressed with a pronoun (Context E); subject expressed with a pronoun and object expressed with a noun phrase (Context F); subject and object expressed with a pronoun (Context G). Although, as expected, informants expressed different grammaticality judgements, some considerations can be made.

First, a tendential asymmetry between a clause-final indexical sign co-referent with the subject and a clause-final indexical sign co-referent with the object was observed, with the former being accepted to a noticeable lower degree than the latter.

Second, the type of overt realization of subject and object (i.e., noun phrase or pronoun) does not seem to have a strong influence on sentence grammaticality. Nonetheless, while no particular difference was observed for subjects, the type of overt realization of objects seems to show a slight tendency: sentences with a noun phrase object and a clause-final indexical sign co-referent with the object were considered grammatical to a higher degree than sentences with a pronominal object and a clause-final indexical sign co-referent with the object, regardless of the type of overt realization of the subject.

Finally, context plays a significant role in the sentence grammaticality, and most noticeably so for objects. In fact, for clause-final indexical signs co-referent with the sentence subject, it seems that context, although still relevant, plays a minor role as for the sentence grammaticality, so that it could be suggested that the observed ungrammaticality is more syntactic in nature. On the other hand, as for clause-final indexical signs co-referent with the sentence object, informants often mentioned that the object to which the clause-final indexical sign refers to is a specific entity, which must have been previously mentioned in the discourse. In any case, the clause-final indexical sign, when grammatical, seems to have a highlighting function of the entity it refers to.

Table III.2, in the following page, shows the grammaticality judgements for declarative clauses with a transitive verb (TO BUY) with different subject and object realizations (Contexts D to G).

³² Informant 02 stated that indexical signs alternating from the subject to the object and back to the subject (or, vice versa, from the object to the subject, and back to the object) are not acceptable, in comparison to the acceptability of G3.

Transitive verb – Declarative clause ³³												
Informant	NP Subject NP Object			NP Subject Pronoun Object			Pronoun Subject NP Object			Pronoun Subject Pronoun Object		
	D1	D2	D3	E1	E2	E3	F1	F2	F3	G1	G2	G3
01	G ^p	NG	G ^b	G ^p	G ^b	G	G ^p	NG	G ^c	G ^p	G ^b	G ^{bc}
02	G	NG	PG	G ^p	G ^b	NG	G ^p	G	G	G ^p	NG	G
03	G	PG	G	G ^p	PG	G	G	PG	G	G ^p	PG	G ^b
04	NG ^{ap}	NG	G	PG ^{ap}	NG	G ^b	G	NG	G ^p	G ^p	NG	G ^b
05	G	G	PG ^a	G	PG	NG	G	G ^c	PG ^a	G	PG	NG

Table III.2 – Grammaticality judgements for declarative clauses with a transitive verb (TO BUY) with different subject and object realizations, namely NP subject and object (D1 to D3), NP subject and pronominal object (E1 to E3), pronominal subject and NP object (F1 to F3), pronominal subject and object (G1 to G3). In the table, G stands for ‘grammatical’, PG for ‘partially grammatical’, and NG for ‘not grammatical’. Sentences accepted with a meaning different from the target one are also labeled ungrammatical (NG).

3.5.1.10 Polar interrogative clause with transitive verb, NP subject, NP object (Context H)

Context H

GOOD DAY! EVERYDAY MORNING TIME EIGHT O’CLOCK YOUNG GUY IX₃ HERE NEWSPAPER SELL COME+++.

‘Good morning! Every morning at eight o’clock a young guy is used to coming here at the newsstand.’

Input sentence H1

YOUNG-GUY NEWSPAPER BUY?

‘Does the young guy buy the newspaper?’

Informants 01, 02, 03, 04, 05 all judged the sentence grammatical. In addition, informant 03 stated that H1 is a general question.

Input sentence H2

YOUNG-GUY NEWSPAPER BUY IX_{subject}?

‘Does the young guy buy the newspaper?’

Informant 01 judged the sentence grammatical. Informant 02 considered the sentence grammatical, and added that the clause-final indexical sign has the function of highlighting the subject. Informant 03 judged the sentence grammatical, and added that the question is focused on the subject. Informant 04 rejected the sentence because of the clause-final indexical sign. Informant 05 considered the sentence grammatical.

Input sentence H3

YOUNG-GUY NEWSPAPER BUY IX_{object}?

‘Does the young guy buy the newspaper?’

³³ Superscripts a, b, c, p have the following meanings:

^a The structure is grammatical *per se* or in other contexts.

^b The structure is accepted yet disliked.

^c The structure is accepted but preferred in other contexts.

^p The structure is the preferred one amongst the ones considered grammatical.

Informant 01 rejected the sentence because of an ambiguity of the clause-final indexical sign, which may refer to the object, or be a locative. Informant 02 considered the sentence grammatical: however, with the context given, the clause-final indexical sign is interpreted as a locative. On the other hand, in a context in which there are different newspapers the clause-final indexical sign would refer to a specific newspaper. The context given is considered not enough informative to yield an object interpretation of the clause-final indexical sign. Informant 03 judged the sentence grammatical, and added that it is focused on the object. Informant 04 considered the sentence grammatical, and added that it is more specific on the type of newspaper. Informant 05 judged the sentence grammatical.

In Context H group, informants 01, 02, 04 preferred H1, whereas informant 03 preferred H2.

3.5.1.11 Polar interrogative clause with transitive verb, NP subject, pronominal object (Context I)

Context I

OH NO! IX₁ SEE NEWSPAPER FINISHED! BUT BEFORE IX₁ ENTER IX₁ YOUNG CL(G-G):
'one person enters, another person exits' EXIT.

'Oh no! The newspapers are all sold out! Well, actually I saw a young guy coming out when I got here.'

Input sentence I1

YOUNG-GUY IX_{object} BUY?

'Does the young guy buy it?'

Informant 01 judged the sentence grammatical. Informant 02 considered the sentence grammatical. Informant 03 rejected the sentence because, with the context given, the aspectual marker DONE is needed. If the input sentence included the aspectual marker DONE, it would be grammatical; in addition, it would be a general question. Informant 04 rejected the sentence because of the pronominal realization of the object with an indexical sign, stating that the sign PE is needed. Informant 05 deemed the sentence partially grammatical, adding that an SVO sentence (i.e., YOUNG-GUY BUY IX_{object}?) would be preferable.

Input sentence I2

YOUNG-GUY IX_{object} BUY IX_{subject}?

'Does the young guy buy it?'

Informant 01 rejected the sentence because the clause-final indexical sign carries an ambiguous interpretation between being co-referent with the subject or being a locative. Informant 02 considered the sentence grammatical. Informant 03 rejected the sentence due to the absence of the aspectual marker DONE. If the aspectual marker DONE was present, the sentence would be grammatical; furthermore, it would be a question on the subject. Informant 04 judged the sentence grammatical. She also added that if PE were used instead of IX_{object}, the sentence would be ungrammatical, because of the presence of too many salient (or highlighted) elements. Informant 05 deemed the sentence partially grammatical because the clause-final indexical sign is unnecessary.

Input sentence I3

YOUNG-GUY IX_{object} BUY IX_{object}?

'Does the young guy buy it?'

Informant 01 rejected the sentence because the clause-final indexical sign is ambiguous between being co-referent with the object or being a locative. Informant 02 deemed the sentence partially grammatical because it is considered unnecessary to repeat the indexical sign. However, she stated that the sentence would be grammatical with another context and with appropriate non-manual markers highlighting *‘that newspaper’*. Informant 03 rejected the sentence for the absence of the aspectual marker DONE. If the aspectual marker DONE was present, the sentence would be grammatical; in addition, it would be a question on the object. Informant 04 rejected the sentence for the unnecessary repetition of the indexical sign. Informant 05 rejected the sentence because of the presence of an unnecessary indexical sign.

In Context I group, informant 02 expressed preference for I1.

3.5.1.12 Polar interrogative clause with transitive verb, pronominal subject, NP object (Context J)

Context J

PLACE NEWSPAPER SELL FRIEND POSS₂ EVERYDAY GO+++.
‘Everyday your friend goes to the newsstand.’

Input sentence J1

IX₃ NEWSPAPER BUY?

‘Does he buy the newspaper?’

Informants 01, 02, 03, 04, 05 all considered the sentence grammatical. In addition, informants 02 and 03 stated that it is a general question.

Input sentence J2

IX₃ NEWSPAPER BUY IX_{subject}?

‘Does he buy the newspaper?’

Informant 01 judged the sentence grammatical. Informant 02 considered the sentence grammatical and added that it highlights the subject (*‘that guy’*). Informant 03 judged the sentence grammatical, further adding that it highlights the subject. Informant 04 considered the sentence grammatical, and added that both J1 and J2 are focused on the subject. As a further remark, she stated that this sentence is more organic in comparison to other similar sentences, since the context is centered on the same referent as the one highlighted in J2 through the indexical sign repetition. Informant 05 judged the sentence grammatical.

Input sentence J3

IX₃ NEWSPAPER BUY IX_{object}?

‘Does he buy the newspaper?’

Informant 01 considered the sentence grammatical, but with a locative interpretation of the clause-final indexical sign. Informant 02 judged the sentence grammatical, adding that it highlights the object. Informant 03 considered the sentence grammatical. Furthermore, she stated that it highlights the (specific) object. Informant 04 judged the sentence grammatical, adding that it is focused on the object. Informant 05 deemed the sentence partially grammatical. Furthermore, he stated that it could be grammatical if the aim is to highlight a specific newspaper (*‘that newspaper’*); otherwise, since the sentence is perceived as clear enough, the clause-final indexical sign unnecessary.

In Context J group, informants 01 and 04 expressed preference for J1.

3.5.1.13 Polar interrogative clause with transitive verb, pronominal subject, pronominal object (Context K)

Context K

PLACE NEWSPAPER SELL FRIEND POSS GO. NEWSPAPER CL(B): ‘newspapers on the counter’ IX₃ EYE-CAUGHT ONE.

‘Your friend goes to the newsstand. He is eye-caught by one of the newspapers on the counter.’

Input sentence K1

IX₃ IX_{object} BUY?

‘Does he buy it?’

Informant 01 considered the sentence grammatical. In addition, with the context given, a sentence with both subject-drop and object-drop (i.e., BUY?) would be also grammatical. Informant 02 rejected the sentence for a clash between the context and the input sentence, which was perceived as sudden and abrupt. Nonetheless, the structure *per se* is grammatical. Informant 03 judged the sentence grammatical. Informant 04 considered the sentence grammatical, but with the context given, a subject-drop (i.e., IX_{object} BUY?) would be more natural. The input sentence as provided would perfectly work with context G, as well. Informant 05 deemed the sentence partially grammatical, stating that it would be completely grammatical only if the object was present in the extra-linguistic context.

Input sentence K2

IX₃ IX_{object} BUY IX_{subject}?

‘Does he buy it?’

Informant 01 considered the sentence grammatical, adding that he personally does not use it frequently. Informant 02 judged the sentence grammatical, although deeming it as redundant with the context given – already focused on the subject. Furthermore, according to informant 02, there are too many indexical signs. Informant 03 judged the sentence grammatical. Informant 04 rejected the sentence because of the many indexical signs, adding that the sentence would be ungrammatical with context G, as well. Informant 05 deemed the sentence ungrammatical because of the many indexical signs present.

Input sentence K3

IX₃ IX_{object} BUY IX_{object}?

‘Does he buy it?’

Informant 01 judged the sentence grammatical. He further added that such a structure would be used to ask for a confirmation, and that it would be perceived as nosy. Informant 02 considered the sentence grammatical, adding that it highlights the object, and that it would be used if the signer is aimed at receiving a precise information about the object, without any kind of misunderstanding. Informant 03 deemed the sentence partially grammatical because of the many indexical signs present. Furthermore, with the context given, the focus is already singling out one particular newspaper, therefore the many indexical signs are not needed and make the sentence ‘heavy’. She would not sign spontaneously such a structure, rather, she would produce a sentence with a subject-drop (i.e., IX_{object} BUY IX_{object}?). Informant 04 deemed the sentence ungrammatical. She added that BUY IX_{object}? would be acceptable,

although the highlighting of the object would still result ‘heavy’. Informant 05 deemed the sentence ungrammatical because of the many indexical signs present.

In Context K group, informant 02 expressed preference for K1.

3.5.1.14 Intermediate summary: polar interrogative clauses with a transitive verb

Polar interrogative clauses with a transitive verb articulated in the neutral space (TO BUY) were tested in four different conditions: subject and object expressed with a noun phrase (Context H); subject expressed with a noun phrase and object expressed with a pronoun (Context I); subject expressed with a pronoun and object expressed with a noun phrase (Context J); subject and object expressed with a pronoun (Context K). Although, as expected, informants expressed different grammaticality judgements, some considerations can be made.

First, no asymmetries between a clause-final indexical sign co-referent with the subject and a clause-final indexical sign co-referent with the object were observed.

Second, the type of overt realization of subject and object (i.e., noun phrase or pronoun) does not seem to have a strong influence on sentence grammaticality. Nonetheless, sentences with a noun phrase subject and a pronominal object, as well as sentences with a pronominal subject and a pronominal object show a lower degree of acceptability: for the former, a clash between the context given and the input sentence is considered to be the source of ungrammaticality, as also suggested by grammaticality judgements given to the sentence without any clause-final indexical signs (i.e., I1), which was also often considered ungrammatical or partially grammatical; for the latter the abundance of indexical signs in the sentence is considered to be the reason of the ungrammaticality.

Third, context plays a relevant role in the sentence grammaticality, as can be seen by judgements. For instance, if the context is not centered on the entity taking the subject role in the input sentence, a clause-final indexical sign co-referent with the subject in the input sentence, even if grammatical, could be perceived as odd or unnatural (see informant 04 remark on J2). Similarly, if the context is not centered on the entity taking the object role in the input sentence, a clause-final indexical sign co-referent with the object in the input sentence, even if grammatical, could be perceived as odd or unnatural.

As for the pragmatic function of the clause-final indexical sign, informants reported that it has the function of highlighting the entity it refers to, whether it is the subject or the object of the sentence. Furthermore, if a clause-final indexical sign co-referent with the object is present, the entity to which the indexical sign refers to is a specific entity (i.e., for the input sentences provided, a specific (kind of) newspaper). The final-clause indexical sign may also have the function of singling out a specific entity in a group, and it is thus grammatical if the context allows for this interpretation, whereas it is either ungrammatical or considered unnecessary if the context already singles out one specific referent (see informant 03 on K3). Finally, notice that in specific cases, the entity to which the indexical sign³⁴ refers to must be present in the extra-linguistic context (see informant 05 remark on K1).

Table III.3, in the next page, shows the grammaticality judgements for polar interrogative clauses with a transitive verb (TO BUY) with different subject and object realizations (Contexts H to K).

³⁴ The indexical sign occurring in K1 is the object in argumental position. Therefore this remark is not restricted to clause-final indexical signs.

Transitive verb – Polar interrogative clause ³⁵												
Informant	NP Subject NP Object			NP Subject Pronoun Object			Pronoun Subject NP Object			Pronoun Subject Pronoun Object		
	H1	H2	H3	I1	I2	I3	J1	J2	J3	K1	K2	K3
01	G ^p	G	NG ^a	G	NG	NG	G ^p	G	NG	G	G ^b	G
02	G ^p	G	NG ^a	G ^p	G	PG ^a	G	G	G	NG ^{ap}	G ^b	G
03	G	G ^p	G	NG ^a	NG ^a	NG ^a	G	G	G	G	G	PG
04	G ^p	NG	G	NG	G	NG	G ^p	G	G	G ^c	NG	NG
05	G	G	G	PG	PG	NG	G	G	PG ^a	PG ^a	NG	NG

Table III.3 – Grammaticality judgements for polar interrogative clauses with a transitive verb (TO BUY) with different subject and object realizations, namely NP subject and object (H1 to H3), NP subject and pronominal object (I1 to I3), pronominal subject and NP object (J1 to J3), pronominal subject and object (K1 to K3). In the table, G stands for ‘grammatical’, PG for ‘partially grammatical’, and NG for ‘not grammatical’. Sentences accepted with a meaning different from the target one are also labeled ungrammatical (NG).

3.5.1.15 Content interrogative clause with transitive verb (Context L)

Context L

HOUSE IN-FRONT-OF POSS₂ IX_{3P} PEOPLE HABIT POSS_{3P}. IX₂ TIME-AGO₂ TELL₁ FATHER_A IX_A EVERY-MONDAY CAFÉ GO, MOTHER EVERY-TUESDAY GYM GO. INSTEAD SON_B IX_B NEWSPAPER BUY WEEK DAY WHICH IX₁ KNOW NOT.

‘Your neighbors have their habits. Once you told me that the father goes to the café every Monday and that the mother goes to the gym every Tuesday. Their son buys the newspaper, but I do not know in which day of the week.’

Input sentence L1

YOUNG-GUY NEWSPAPER BUY WHEN?

‘When does the young guy buy the newspaper?’

Informant 01 judged the sentence grammatical. Informant 02 judged the sentence grammatical. Informant 03 judged the sentence grammatical, adding that, with the context given, she would probably sign SON_K IX_K (i.e., ‘The son’) instead of YOUNG-GUY. As a further remark, she stated that the question is general and the kind of newspaper is unknown. Informant 04 deemed the sentence partially grammatical because of the noun phrase YOUNG-GUY: since the subject is clear from previous discourse, a subject-drop or a pronominal subject would be preferred. Nonetheless, the structure is *per se* grammatical. Informant 05 judged the sentence grammatical.

Input sentence L2

YOUNG-GUY NEWSPAPER BUY WHEN IX_{subject}?

‘When does the young guy buy the newspaper?’

Informant 01 accepted the sentence, but expressed dislike and stated that he would not use it. Informant 02 judged the sentence grammatical. Informant 03 considered the sentence grammatical, adding that the question is subject-oriented. Informant 04 rejected the sentence because of the

³⁵ Superscripts a, b, c, p have the following meanings:

^a The structure is grammatical *per se* or in other contexts.

^b The structure is accepted yet disliked.

^c The structure is accepted but preferred in other contexts.

^p The structure is the preferred one amongst the ones considered grammatical.

indexical sign occurring in a post-wh position, and stated that it would be preferable to have the interrogative sign at the end of the sentence. Informant 05 deemed the sentence partially grammatical, and added that the clause-final indexical sign co-referent with the subject is not necessary.

Input sentence L3

YOUNG-GUY NEWSPAPER BUY WHEN IX_{object}?

‘When does the young guy buy the newspaper?’

Informant 01 considered the sentence grammatical, but interpreted the clause-final indexical sign as a locative. Informant 02 rejected the sentence because of the indexical sign co-referent with the object after the interrogative sign WHEN. She added that if the interrogative sign was WHY (*motivo*),³⁶ the sentence would be grammatical. The asymmetry reported is due to the fact that WHEN asks about the action carried out by the subject, whereas WHY could be centered on the object as well (i.e., ‘Why did you buy *that*?’ vs. ‘Why did *you* buy that?’). Informant 03 rejected the sentence. However, if WHY (*perché*) was in place of WHEN, the sentence would become acceptable. She further stated that (YOUNG-GUY_K IX_K) IX_{object} BUY IX_{object} WHY Q_{artichoke}? is also grammatical. Informant 04 rejected the sentence for both the presence of the indexical sign after the interrogative sign, and for its being referred to the object, inconsistent with the context given. Informant 05 deemed the sentence partially grammatical: it is acceptable because the clause-final indexical sign has a reinforcing function, but its occurrence before the interrogative sign would be more welcomed.

Input sentence L4

YOUNG-GUY NEWSPAPER BUY IX_{subject} WHEN?

‘When does the young guy buy the newspaper?’

Informant 01 deemed the sentence ungrammatical. Informant 02 judged the sentence grammatical, but added that ‘a comma is perceived’, as if before the interrogative sign WHEN the whole sentence is silently and implicitly repeated. Informant 03 deemed it partially grammatical, stating that she would not spontaneously produce it. She further added that if the predicate was reversible, such a structure could lead to a potential thematic role inversion. Informant 04 judged the sentence as grammatical. Informant 05 deemed the sentence partially grammatical because the indexical sign co-referent with the subject is perceived as not necessary.

Input sentence L5

YOUNG-GUY NEWSPAPER BUY IX_{object} WHEN?

‘When does the young guy buy the newspaper?’

Informant 01 judged the sentence grammatical, adding that it refers to a specific newspaper. Informant 02 judged the sentence grammatical, and added that ‘a comma is perceived’ before the interrogative sign. As a further remark, she stated that the object is highlighted. Informant 03 judged the sentence grammatical, adding that it refers to a specific newspaper, previously mentioned in the discourse. Informant 04 deemed the sentence ungrammatical with the context given, but stated that the structure *per se* is grammatical, and that it would be organic with an appropriate context focused on the object. Informant 05 judged the sentence grammatical.

In Context L group, informants 01 and 02 expressed preference for L1.

³⁶ In LIS, two different signs are used for WHY: one is Q_{artichoke}, usually accompanied with mouthing ‘perché’; the other is REASON, usually accompanied with mouthing ‘motivo’.

3.5.1.16 Intermediate summary: content interrogative clauses with a transitive verb

Content interrogative clauses with a transitive verb articulated in the neutral space (TO BUY) were tested in five different conditions: content interrogative clause without a clause-final indexical sign (L1); content interrogative clause with a clause-final indexical sign co-referent with the subject (L2); content interrogative clause with a clause-final indexical sign co-referent with the object (L3); content interrogative clause with an indexical sign co-referent with the subject, placed before the interrogative sign (L4); content interrogative clause with an indexical sign co-referent with the object, placed before the interrogative sign (L5). Although, as expected, informants expressed different grammaticality judgements, some considerations can be made.

First, an asymmetry between the clause-final indexical sign co-referent with the subject and the clause-final indexical sign co-referent with the object can be observed, with the former being more accepted than the latter, considered strongly ungrammatical. Nonetheless, it seems that for the clause-final indexical sign co-referent with the subject, the ungrammaticality was in part triggered by the specific interrogative sign used, since two informants judged as (marginally) grammatical the same sentence with the interrogative WHY.

Second, an asymmetry between the post-verbal indexical sign co-referent with the subject occurring before the interrogative sign and the post-verbal indexical sign co-referent with the object occurring before the interrogative sign can be observed, with the former being less accepted than the latter.

Table III.4 below shows the grammaticality judgements for content interrogative clauses with a transitive verb (TO BUY) with different positionings of the indexical sign (Context L).

Transitive verb – Content interrogative clause ³⁷					
Informant	No IX	WH IX _{subject}	WH IX _{object}	IX _{subject} WH	IX _{object} WH
	L1	L2	L3	L4	L5
01	G ^p	G ^b	NG	NG	G
02	G ^p	G	NG ^c	G ^d	G ^d
03	G	G	NG ^c	PG	G
04	PG ^a	NG	NG	G	NG ^a
05	G	PG	PG	PG	G

Table III.4 – Grammaticality judgements for content interrogative clauses with a transitive verb (TO BUY) with different positionings of the indexical sign co-referent to the subject or object, namely no indexical sign (L1), post-wh indexical sign co-referent with the subject (L2), post-wh indexical sign co-referent with the object (L3), pre-wh indexical sign co-referent with the subject (L4), pre-wh indexical sign co-referent with the object (L5). In the table, G stands for ‘grammatical’, PG for ‘partially grammatical’, and NG for ‘not grammatical’. Sentences accepted with a meaning different from the target one are also labeled ungrammatical (NG).

³⁷ Superscripts a, b, c, p have the following meanings:

^a The structure is grammatical *per se* or in other contexts.

^b The structure is accepted yet disliked.

^c The structure is accepted with the interrogative sign WHY.

^d The structure was perceived as being separated by a comma before the interrogative sign.

^p The structure is the preferred one amongst the ones considered grammatical.

3.5.1.17 Intermediate summary: grammaticality judgement task

Grammaticality judgements were collected for declarative clauses, polar interrogative clauses, content interrogative clauses, with an intransitive verb (TO WORK) and a transitive verb (TO BUY).

First, an indexical sign, co-referent with a plural subject, but underspecified for number features is ungrammatical in either the clause-initial (i.e., *IX WORK IX_{3P}) and the clause-final position (i.e., *IX_{3P} WORK IX), in both declarative clauses and polar interrogative clauses.³⁸

Second, a clause-final indexical sign co-referent with the subject was rarely judged grammatical in declarative clauses, with both an intransitive and a transitive verb. Furthermore, in the latter case, the type of overt realization of the arguments (i.e., noun phrase or pronoun) did not seem to influence the sentence grammaticality. On the other hand, a clause-final indexical sign co-referent with the subject was often judged grammatical in polar interrogative clauses, with both an intransitive and a transitive verb. In addition, in the latter case, the type of overt realization of the arguments (i.e., noun phrase or pronoun) did not seem to particularly influence the sentence grammaticality, except for sentences with a pronominal object or both pronominal arguments, which show a lower degree of acceptability.

Third, a clause-final indexical sign co-referent with the object was often judged grammatical, in both declarative clauses and polar interrogative clauses, with a transitive verb. The type of overt realization of arguments does not seem to influence the sentence grammaticality, except for sentences with a pronominal object or both pronominal arguments, which show a lower degree of acceptability. On the other hand, context seems to play a crucial role for the grammaticality of a clause-final indexical sign co-referent with the object: according to the informants, the object has to be previously mentioned in the discourse, or be a known entity.

As for content interrogatives with an intransitive verb, no clear patterns arise. Some signers allow for a clause-final indexical sign co-referent with the subject, placed after the interrogative sign, whereas others do not. Furthermore, an indexical sign co-referent with the subject, placed before the interrogative sign, is judged as grammatical to a higher degree when it is the only overt occurrence of the subject.

As for content interrogatives with a transitive verb, an indexical sign co-referent with the subject receives a split evaluation, if placed either before or after the interrogative sign. On the other hand, an indexical sign co-referent with the object is ungrammatical if occurring after the interrogative sign, whereas it is grammatical if it occurs post-verbally before the interrogative sign.

As for its pragmatic function, informants referred that the clause-final indexical sign is used to highlight, underline, stress, emphasize, or specify the entity it refers to. Context seems to play a crucial role for the grammaticality of the clause-final indexical sign: the entity to which the clause-final indexical sign refers has to be previously mentioned in the discourse. Moreover, the overall centering of the discourse should be on the same entity: for instance, if one sentence is centered on referent A, it would be odd to have the following sentence with a highlight on referent B, not mentioned, not introduced, and of which nothing has been previously stated.³⁹

³⁸ This condition was tested only in declarative clauses and polar interrogative clauses with an intransitive verb.

³⁹ For instance, a sentence such as ‘The young guy is used to going to the newsstand every day. He really loves that newspaper!’ would be odd, whereas ‘The young guy is used to reading an art magazine. He really loves that magazine!’

3.5.2 Data – Sentence repetition task

In this section, data from the sentence repetition task will be described, ordered for sentence type.

A total of 240 sentences were collected, including sentences that differ from the input sentences given. Of these, 131 sentences were analyzed with ELAN software⁴⁰ and will be described.⁴¹

For each sentence type the input context and the input sentences will be provided first.⁴² Contexts and input sentences are referred to with the same codes used previously for data from the grammaticality judgement task (§ 3.5.1): for instance, A1 is the first input sentence of Context A, A2 is the second input sentence of Context A, and so forth. Then, it will be listed which informant(s) produced an output sentence corresponding with a given input sentence, specifying within brackets its input sentence(s): for instance, ‘Sentence A1 was produced by informant 01 (A1, A2, A4)’ means that an output sentence corresponding to input sentence A1 was produced with A1, A2, and A4 as the input sentences. If the output sentence differs from the input sentence provided (in the case above, A4 as the input, A1 as the output), or if no output sentences were produced for a given input sentence, the implication is that the input sentence was either dispreferred or considered ungrammatical.

After that, a description of the analyzed sentences is provided. Sentences are reported in glosses provided with main non-manual markers and a translation in English, followed by a description which includes any further relevant manual marker, non-manual marker, prosodic cue, context insight, etc. At the right of the gloss, the measurements⁴³ (in milliseconds) of the time of articulation of signs, and of time between signs (in *italics*) is provided. In the descriptions, produced sentences are given the code P (‘produced’) followed by a progressive number – in order to be easily recalled in the following discussion. Furthermore, the sentence is also given a code (e.g., 01 A1), which includes the informant code (i.e., 01) and the input sentence code (i.e., A1).

Non-manual markers such as head sideward turn, head side lean, head sideward movement, are not reported in the sentences described in this section. These non-manual markers often occur in the collected sentences, and are considered to be the expression of verbal agreement morphology. For the sake of clarity, the following sentences are reported with a complete gloss as an example.

(1)	Gloss:	YOUNG-GUY	NEWSPAPER	BUY	.
	Mouthing:	<u><i>ragazzo</i></u>	<u><i>giornale</i></u>	<u><i>compra</i></u>	
	Torso movement:			<u>turn to the left</u>	
	Head, side turn:			<u>turn to the left</u>	
	Headnod:			hn	
	Eyeblink:		eb	eb	
	Eyebrows:			<u>raised</u>	

Translation: ‘The young-guy buys the newspaper.’

⁴⁰ ELAN (Version 6.0) [Computer software]. (2020). Nijmegen: Max Planck Institute for Psycholinguistics, The Language Archive. Retrieved from: <https://archive.mpi.nl/tla/elan>.

⁴¹ Sentences excluded from the analysis include, among the others: trials for camera framing, performance mistakes, perseveration mistakes (e.g., the usage of a NP object instead of a pronominal object as a form of perseveration of a previous input sentence), output sentences different from the input sentences given.

⁴² The gloss is simplified and consists in the transcription of signs, provided with a translation into English.

⁴³ Measurements were taken manually, and may be subject to inaccuracies. Consider a given measurement ± 30 ms, as an error window corresponding to one frame.

(2)	Gloss:	IX ₃	NEWSPAPER	BUY
	Mouthing:		<u>giornale</u>	<u>compra</u>
	Mouth:	<u>mcd</u>		
	Torso movement:	<u>right lean</u>	<u>turn to the left</u>	
	Head, side turn:		<u>turn to the left</u>	
	Head, sideward:	<u>right</u>		
	Headnod:			<u>hn+++</u>
	Eyeblink:		eb	
	Eyes:	<u>squint</u>		
	Eyebrows:	<u>raised</u>		

Translation: 'He buys the newspaper.'

Finally, for each group of sentences, mean measurements of time of articulation of signs and time between signs is reported, so that a comparison could be made, in particular for time between signs, which could be revealing of syntactic boundaries.

Sentences worthy of attention yet diverse from the input sentences are described in the next section (§ 3.5.3, Further data collected). Conversely, other collected sentences are not described.⁴⁴

3.5.2.1 Declarative clause with an intransitive verb (Context A)

Context A

YESTERDAY WORKER_K AREA_K STRIKE, INSTEAD TODAY –
 'Yesterday workers struck, instead today –'

Input sentences for Context A:

- A1 IX_{3P} WORK.
 - A2 IX_{3P} WORK IX_{3P}.
 - A3 WORK IX_{3P}.
 - A4 IX_{3P} WORK IX.
 - A5 IX WORK IX_{3P}
- 'They work.'

Sentence A1 was produced by informant 01 (as an output from input sentences A1, A2, A4), informant 02 (A1, A4, A5), informant 03 (A1, A3), and informant 04 (A1, A2, A4, A5). Sentence A2 was produced by informant 02 (A2) and informant 03 (A2). Sentence A3 was produced by informant 01 (A3), informant 02 (A3), and informant 04 (A3). Sentences A4 and A5 were not produced by any informant.

⁴⁴ For instance, a sentence such as IX₃ PA-PA NEWSPAPER PI-PI BUY+++ ('He is used to buying the newspaper in the very same place'), provided as an output to Context F, input sentence F1, was not included in the analysis and in the subsequent description because it does not correspond to any of the target sentences. All collected sentences are interesting: the one mentioned, for instance, was triggered by a perceived redundancy in the context provided, therefore a rather simple sentence such as IX₃ NEWSPAPER BUY was not considered to be natural. It is not possible, unfortunately, to include all the collected sentences in the analysis.

3.5.2.1.1 Output A1

- ' lavoro '
 mcd _
 re _ _
- (P1) IX_{3P} WORK~. 263, 238, 828
 'They work.'
 [Sentence code: 01 A1]

The sentence is characterized by mouthing of *lavoro* ('work') over the sign WORK. In addition, mouth corners down occur over the sign IX_{3P}, and almost over the entirety of the sign WORK. As for non-manual markers, raised eyebrows occur over the sign IX_{3P} and fade during the articulation of the sign WORK. The clause-final sign, WORK, is subject to hold (150 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

- ' loro ' ' lavorano '
 re
- (P2) IX_{3P} WORK~. 364, 304, 823
 'They work.'
 [Sentence code: 02 A1]

The sentence is characterized by mouthing of *loro* ('they') over IX_{3P}, and mouthing of *lavorano* ('work', inflected for the indicative mood, present tense, third-person plural) over the sign WORK. As for non-manual markers, raised eyebrows occur over the sign IX_{3P}. The clause-final sign, WORK, is characterized by movement repetition, which leads to final lengthening, but is not subject to hold. Prosodic cues or pauses within the sentence are not observed.

- ' lavoro '
 pl
 fe _
 hn hn+++
- (P3) IX_{3P} WORK~. 428, 371, 961
 'They work.'
 [Sentence code: 03 A1]

The sentence is characterized by mouthing of *lavoro* ('work') over the sign WORK. In addition, closed and pressed lips occur over the sign IX_{3P}. As for non-manual markers, light eyebrows furrowing spreads over both signs, and fades towards the end of the sentence. Furthermore, a single headnod is produced over the sign IX_{3P}, whereas a repeated headnod is produced over the sign WORK. The clause-final sign, WORK, is characterized by movement reduplication, which leads to final lengthening, but is not subject to hold. Prosodic cues or pauses within the sentence are not observed.



Figure III.1 – Furrowed eyebrows, closed and pressed lips as appeared in declarative sentence (P3).

'lavoro'

mcd

re

hn+++

(P4) IX_{3P} WORK~.

299, 173, 1028

'They work.'

[Sentence code: 04 A1]

The sentence is characterized by mouthing of *lavoro* ('work') over the sign WORK. In addition, mouth corners slightly down occur over IX_{3P}. As for non-manual markers, raised eyebrows occur over IX_{3P}. Furthermore, a repeated, light, headnod is produced over the sign WORK. The clause-final sign, WORK, is characterized by movement reduplication, which leads to final lengthening, but is not subject to hold. Prosodic cues or pauses within the sentence are not observed.

3.5.5.1.2 Output A2

'loro' 'lavorano'

pl

re

hn+++

(P5) IX_{3P} WORK IX_{3P}~.

296, 272, 456, 129, 669

'They work.'

[Sentence code: 02 A2]

The sentence is characterized by mouthing of *loro* ('they') over the sign IX_{3P} and mouthing spreading of *lavorano* ('work', inflected for the indicative mood, present tense, third-person plural) over the sign WORK and the clause-final indexical sign co-referent with the subject. As for non-manual markers, raised eyebrows occur over the clause-initial IX_{3P}. Moreover, a repeated headnod is produced over the sign WORK and the clause-final indexical sign co-referent with the subject, and is extended also after the latter. After the clause-final sign, closed and tensed lips are observed for a duration inferior to the spreading of the headnod after the end of the sentence. The clause-final sign, IX_{3P} co-referent with the subject, is subject to hold (300 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

' lavoro '
mcd mcd/pl
 re
 hn

eb

(P6) IX_{3P} WORK IX_{3P}.
 'They work.'
 [Sentence code: 03 A2a]

195, 105, 330, 139, 111

The sentence is characterized by mouthing of *lavoro* ('work') over the sign WORK and the clause-final indexical sign co-referent with the subject. In addition, mouth corners down occur over the clause-initial IX_{3P}. As for non-manual markers, raised eyebrows occur over the clause-initial IX_{3P}, which is also accompanied by a single headnod. Furthermore, at the end of the sentence, an eyeblink is produced, followed by mouth corners down and closed and pressed lips. The clause-final sign, IX_{3P} co-referent with the subject, is not subject to final lengthening or hold. Prosodic cues or pauses within the sentences are not observed.

Another instance of the same output sentence, produced by the same informant, was collected. As can be seen below, it features slightly different non-manual markers.

 ' lavoro '
mcd pl
 re
 hn hn+++
 eb

(P7) IX_{3P} WORK IX_{3P}.
 'They work.'
 [Sentence code: 03 A2b]

497, 305, 360, 241, 360

The sentence above differs from (P6) in its featuring a repeated headnod occurring over the sign WORK and the clause-final IX_{3P}, extended after the end of the sentence. The clause-final sign, IX_{3P} co-referent with the subject, is not subject to final lengthening or hold. Prosodic cues within the sentence are not observed; nonetheless, a pause is perceived after the clause-initial IX_{3P}.

3.5.2.1.3 Output A3

 ' lavoro '
 mcd
 re
 hn+++

(P8) WORK IX_{3P}~.
 'They work.'
 [Sentence code: 01 A3]

411, 220, 866

The sentence is characterized by mouthing spreading of *lavoro* ('work') over the sign WORK and the clause-final IX_{3P}. In addition, mouth corners down occur over the signs WORK and IX_{3P}, ending before the last sign hold. As for non-manual markers, raised eyebrows occur over the sign WORK. Furthermore, a repeated headnod occurs over the signs WORK and IX_{3P}, fading before the last sign hold. The clause-final sign, IX_{3P}, is subject to hold (450 ms), which leads to final lengthening. Prosodic cues or pauses within the sentences are not observed.

tl
 ibr
 hn+++

(P9) WORK IX_{3P}~.

498, 170, 865

‘They work.’

[Sentence code: 02 A3]

The sentence is characterized by mouthing spreading of *laborano* (‘work’, inflected for the indicative mood, present tense, third-person plural) over the signs WORK and IX_{3P}. As for non-manual markers, inner brow raise occurs over the entire sentence: this type of eyebrows raising differs qualitatively from the one produced in polar interrogative clauses (see image III.2 for a comparison). Furthermore, a repeated headnod occurs over the entire sentence and extends after it (for about 900 ms). The clause-final sign, IX_{3P}, is subject to hold (480 ms), which leads to final lengthening; moreover, closed and pressed lips are observed towards its end and after it. Prosodic cues or pauses within the sentences are not observed.



Figure III.2 – Inner brow raise (left) and eyebrows raising (right).

 re _ _ _

(P10) WORK IX_{3P}.

531, 136, 365

‘They work.’

[Sentence code: 04 A3]

The sentence is characterized by mouthing spreading of *lavoro* (‘work’) over the sign WORK and the clause-final IX_{3P}. As for non-manual markers, eyebrows are lightly raised over the sign WORK and slowly fade to a neuter position during the articulation of IX_{3P}. The clause-final sign, IX_{3P}, is not subject to final lengthening or hold. Prosodic cues or pauses within the sentences are not observed.

3.5.2.1.4 Informants’ insights on Context A sentences

According to informant 01, it is possible to sign IX_{3P} WORK or WORK IX_{3P}, equally. On the other hand, informant 03 stated that, with the context given, the order WORK IX_{3P} leads to ungrammaticality, adding that while such a structure is acceptable in a polar interrogative clause, it is probably not the case in a declarative clause. Informant 04, who also produced WORK IX_{3P},

expressed preference for IX_{3P} WORK. Moreover, informant 02 advanced the hypothesis for which some signers may repeat IX_{3P} (as in IX_{3P} WORK IX_{3P}) as a taking time strategy, while they are thinking about the following to say, as an equivalent of mumbling.

3.5.2.1.5 Comment on Context A output sentences

As can be seen from Table III.5 below, the between-signs time is comparable in A1-A2 and A2-A3. This, and the absence of pauses and prosodic cues within the sentence, suggests that these structures (i.e., A1, A2, A3) might not differ in their syntax.

As expected, the duration of the sign WORK differs greatly across sentences when it is produced in sentence-initial position (A3), mid position (A2), or final position (A1). Conversely, to be understood is the difference between the clause-final IX_{3P} in sentences A2 and A3: as it was seen, the clause-final sign can be subject – but this is not always the case – to final lengthening. The longer duration of the clause-final sign in A3 is supposedly due to either the signer’s signing style and/or the reduced amount of data, or the need to better highlight IX_{3P}, since that is its first occurrence in the sentence. However, if one subtracts from the total duration of a sign the length of its hold, the obtained value is 280 ms for sentence A2, and 389 ms for sentence A3, which, although still longer, is a more similar duration.⁴⁵

Finally, the mean time between the clause-initial indexical sign and the verb is longer than the mean time between the verb and the clause-final indexical sign.

In Table III.5 below, mean signs duration and mean between-signs time (indicated as ‘time’) in output sentences A1-A3 is shown.

	A1	A2	A3
IX _{3P}	338 ms	329 ms	-
<i>time</i>	271 ms	227 ms	-
WORK	910 ms	382 ms	480 ms
<i>time</i>	-	173 ms	175 ms
IX _{3P}	-	380 ms	699 ms

Table III.5 – Mean signs duration and mean between-signs time in output sentences A1-A3.

⁴⁵ Notice the similar mean duration between the clause-final indexical sign without hold in A3 (389 ms) and the mean duration of the clause-initial indexical sign in A1 (338 ms).

3.5.2.2 Polar interrogative clause with an intransitive verb (Context B)

Context B

YESTERDAY WORKER_K AREA_K STRIKE. BUT TODAY?

‘Yesterday workers struck. But, today?’

Input sentences for Context B:

B1 IX_{3P} WORK?

B2 IX_{3P} WORK IX_{3P}?

B3 WORK IX_{3P}?

B4 IX_{3P} WORK IX?

B5 IX WORK IX_{3P}?

‘Do they work?’

Sentence B1 was produced by informant 01 (B1, B2, B5), informant 02 (B1), informant 03 (B1), and informant 04 (B1, B2, B5). Sentence B2 was produced by informant 02 (B2) and informant 03 (B2). Sentence B3 was produced by informant 01 (B3), informant 02 (B3), informant 03 (B3), and informant 04 (B3, B4). Target sentences B4 and B5 were not produced by any informant, as they were judged as ungrammatical with the given meaning. Nonetheless, the same sentences were produced by some informants with a locative interpretation⁴⁶ of the indexical sign (either in the clause-initial or clause-final position).

3.5.2.2.1 Output B1

‘lavoro’
mcd
re

(P11) IX_{3P} WORK~?

224, 208, 792

‘Do they work?’

[Sentence code: 01 B1]

The sentence is characterized by mouthing of *lavoro* (‘work’) over the sign WORK. In addition, mouth corners down extend over the whole sentence. As for non-manual markers, as expected in a polar interrogative clause, raised eyebrows are produced over the entire sentence. The clause-final

⁴⁶ Namely the following:

a) IX-locative WORK?

b) WORK IX-locative?

c) IX_{3P} WORK IX-locative?

d) IX-locative WORK IX_{3P}?

‘Do (they) work here?’

In particular, the sentence IX-locative WORK IX_{3P}?, whose main non-manual marker, occurring over the entire sentence, is furrowed eyebrows, is certainly noteworthy. The particular non-manual marker present conveys a specific meaning: differently from more typical polar interrogative clauses marked with raised eyebrows, the signer is not asking whether they work or not, rather is asking for a confirmation of the fact that they work at the indicated place (known in the discourse). The sentence does not mean ‘Do they work here?’, but something such as ‘Do they work *here*, right?’. For other polar interrogative clauses marked with furrowed eyebrows, compare (P16) in § 3.5.2 (Data – Sentence repetition task), and (E5) and (E6) in § 3.5.3 (Further collected data). Nonetheless, when asking for a confirmation, not necessarily a polar interrogative clause requires furrowed eyebrows: compare judgements on sentence B3 (§ 3.5.1, Data – Grammaticality judgement task), and comments on sentences (P15), (P16) and (P115) (§ 3.5.2, Data – Sentence repetition task).

sign, WORK, is subject to hold (200 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

- re
 we
- (P12) IX_{3P} WORK~? 428, 270, 1019
‘Do they work?’
[Sentence code: 02 B1]

The sentence is characterized by mouthing of *lavoro* (‘work’) over the sign WORK. As for non-manual markers, raised eyebrows and wide eyes occur over the whole sentence. The clause-final sign, WORK, is subject to movement reduplication, which leads to final lengthening, but is not subject to hold. Prosodic cues or pauses within the sentence are not observed.

- re
 we
- (P13) IX_{3P} WORK~? 292, 193, 1010
‘Do they work?’
[Sentence code: 03 B1]

- re
 we
- (P14) IX_{3P} WORK~? 242, 194, 698
‘Do they work?’
[Sentence code: 04 B1]

The sentences above are characterized by mouthing of *lavoro* (‘work’) over the sign WORK. In addition, mouth corners down occur over the sign IX_{3P}. As for non-manual markers, raised eyebrows and wide eyes are produced over the entire sentence. The clause-final sign, WORK, is subject to movement reduplication and hold (400 ms) in (P13), and movement reduplication only in (P14), resulting in both cases in final lengthening. Prosodic cues or pauses within the sentence are not observed.

3.5.2.2.2 Output B2

- re
 we
 hn+++
- (P15) IX_{3P} WORK IX_{3P}~? 322, 260, 844, 259, 1227
‘Do they work?’
[Sentence code: 02 B2]

The sentence is characterized by mouthing of *loro* ('they') over the clause-initial IX_{3P}, and mouthing spreading of *lavora* ('work', in a truncated or uninflected form)⁴⁷ over the sign WORK and the clause-final IX_{3P}. As for non-manual markers, raised eyebrows and wide eyes occur over the entire sentence, and are loosened during the last sign hold. Furthermore, a repeated headnod is produced over the signs WORK and IX_{3P}. The clause-final indexical sign, IX_{3P}, is subject hold (500 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

'lavoro'
mcd
fe

(P16) IX_{3P} WORK IX_{3P}~? 191, 139, 231, 093, 941
'Do they work?'
[Sentence code: 03 B2]

The sentence is characterized by mouthing spreading of *lavoro* ('work') over the sign WORK and the clause-final IX_{3P}. In addition, mouth corners down occur over the clause-initial IX_{3P}. As for non-manual markers, furrowed eyebrows occur over the entire sentence. The clause-final IX_{3P} is subject to hold (500 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed. Most importantly, the non-manual marker furrowed eyebrows carries a specific meaning: the signer is asking for a confirmation of the fact 'they work', and not simply whether they work or not, which would require raised eyebrows.⁴⁸



Figure III.3 – Furrowed eyebrows (left) as appeared in sentence (P16), a polar interrogative clause carrying a nuance of meaning consisting in a request for confirmation, compared with raised eyebrows (right) in a typical polar interrogative clause.

⁴⁷ In Italian, 'lavora' is indicative mood, present tense, third person singular, whereas 'lavorano' is indicative mood, present tense, third person plural, and 'lavorare' is infinite mood, present tense. As seen in Chapter 1 § 1.1.1, mouthing can be truncated or uninflected. Therefore, it is not possible to determine whether the mouthing 'lavora' is a truncated form (either from 'lavorare' or 'lavorano'), an uninflected form (either from 'lavorare' or 'lavora'), or both (from 'lavorare').

⁴⁸ This piece of information was confirmed by the informant herself, whom was asked to provide feedback on this and similar sentences after the sessions. See also § 3.5.3, Further collected data, and footnote 46 above, for other instances of the same usage of furrowed eyebrows in polar interrogative clauses.

3.5.2.2.3 Output B3

- | | | |
|-------|---|---------------|
| | <u> </u>
<u> 'lavoro'</u>
<u> mcd</u>
<u> re</u> | |
| (P17) | WORK IX _{3P} ~?
‘Do they work?’
[Sentence code: 01 B3] | 356, 244, 828 |

The sentence is characterized by mouthing spreading of *lavoro* (‘work’) over the signs WORK and IX_{3P}. In addition, mouth corners down are produced over the entire sentence. As for non-manual markers, raised eyebrows occur over the entire clause, and start fading at the beginning of the clause-final sign hold. The clause-final sign, IX_{3P}, is subject to hold (500 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

- | | | |
|-------|--|----------------|
| | <u> </u>
<u> 'lavoro'</u>
<u> re</u>
<u> we</u> | |
| (P18) | WORK IX _{3P} ~?
‘Do they work?’
[Sentence code: 02 B3] | 447, 184, 1364 |

The sentence is characterized by mouthing spreading of *lavoro* (‘work’) over the signs WORK and IX_{3P}. As for non-manual markers, raised eyebrows and wide eyes occur over the entire sentence. The clause-final sign, IX_{3P}, is subject to hold (700 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

- | | | |
|-------|---|----------------|
| | <u> </u>
<u> 'lavoro'</u>
<u> mcd</u>
<u> re</u> | |
| (P19) | WORK IX _{3P} ~?
‘Do they work?’
[Sentence code: 03 B3] | 179, 180, 1000 |

The sentence is characterized by mouthing spreading of *lavoro* (‘work’) over the signs WORK and IX_{3P}. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows occur over the entire sentence. The clause-final sign, IX_{3P}, is subject to hold (500 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

- | | | |
|-------|--|---------------|
| | <u> </u>
<u> 'lavoro'</u>
<u> re</u>
<u> we</u> | |
| (P20) | WORK IX _{3P} ~?
‘Do they work?’
[Sentence code: 04 B3] | 400, 129, 713 |

The sentence is characterized by mouthing spreading of *lavoro* (‘work’) over the signs WORK and IX_{3P}. As for non-manual markers, raised eyebrows and wide eyes occur over the entire sentence. The clause-final sign, IX_{3P}, is subject to hold (250 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

3.5.2.2.4 Informants' insights on Context B sentences

According to informants 01 and 04 the IX_{3P} repetition is not necessary. On the other hand, informants 02 and 03, who produced IX_{3P} WORK IX_{3P}?, suggest that the sentence carries a specific meaning, namely a request for a confirmation of what asked (probably something similar, as for the function, to a question tag: “They work, don’t they?”).⁴⁹

3.5.2.2.5 Comment on Context B output sentences

As can be seen in Table III.6 below, the between-signs mean time in B1-B2 and in B2-B3 is comparable. The clause-final indexical sign co-referent with the subject, occurring in both sentences B2 and B3 is comparable, as well.⁵⁰ Comparing Context A and Context B output sentences, the most evident difference lies in the clause-final indexical sign length, clearly longer in B2-B3 sentences than in A2-A3 sentences. More data are needed to verify whether polar interrogative clauses trigger longer final lengthenings and/or longer holds than declarative clauses.⁵¹

Finally, the mean time between the clause-initial indexical sign and the verb is almost identical, although tendentially slightly longer, than the mean time between the verb and the clause-final indexical sign.

In Table III.6 below, mean signs duration and mean between-signs time (indicated as ‘time’) in output sentences B1-B3 is shown.

	B1	B2	B3
IX _{3P}	296 ms	256 ms	-
<i>time</i>	216 ms	199 ms	-
WORK	880 ms	537 ms	346 ms
<i>time</i>	-	176 ms	184 ms
IX _{3P}	-	1084 ms	976 ms

Table III.6 – Mean signs duration and mean between-signs time in output sentences B1-B3.

⁴⁹ Informants 02 and 03 produced the same output sentence, as for signs and meaning, although characterized by raised eyebrows and furrowed eyebrows, respectively. See footnotes 46 and 48 for more details.

⁵⁰ As for the mean length of the clause-final indexical sign without the hold duration, it is 584 ms for sentence B2 and 489 ms for sentence B3. Notice also the different mean duration between the clause-final indexical sign without hold in B3 (489 ms) and the mean duration of the clause-initial indexical sign in B1 (296 ms). In particular, while the mean duration of the clause-initial indexical sign is similar in A1 (338 ms) and B1 (296 ms), the mean duration of the clause-final indexical sign – without hold duration – is somewhat different in A3 (389 ms) and B3 (489 ms), specifically longer in the polar interrogative clause.

⁵¹ Declarative clauses not featuring adverbial incorporation, which leads to modifications of the manual features of the verb, including duration.

3.5.2.3 Content interrogative clause with an intransitive verb (Context C)

Context C

BANK STREET_A ROME_A, OFFICE-WORKER_K AREA_K, STREET_B MILAN_B CHANGE
 A MOVE_B. IX_{3P} CONTRACT CHANGE₊₊₊, TIME SLOT, WEEK DATE CHANGE₊₊₊. IX₁
 UNDERSTAND NOTHING. IX₂ SITUATION KNOW WELL –

‘The office workers of the bank (office) in Rome Street were moved to (the bank office in) Milan Street. Their contract completely changed: their working hours and working days changed. I did not understand anything (about it). You know the situation well –

Input sentences for Context C:

- C1 IX_{3P} WORK WHEN?
- C2 IX_{3P} WORK WHEN IX_{3P}?
- C3 WORK WHEN IX_{3P}?
- C4 IX_{3P} WORK IX_{3P} WHEN?
- C5 WORK IX_{3P} WHEN?
 ‘When do they work?’

Sentence C1 was produced by informant 01 (as an output sentence from input sentences C1, C2, C3, C4, C5), informant 02 (C1, C2), informant 03 (C1), and informant 04 (C1, C2, C3, C4). Sentence C2 was produced by informant 02 (C2). Sentence C3 was produced by informant 02 (C3). Sentence C4 was produced by informant 02 (C4) and informant 03 (C4). Sentence C5 was produced by informant 02 (C5), informant 03 (C3, C5), and informant 04 (C3, C5). Therefore, among the structures proposed, the ones that were most often produced were C1 and C5, whereas the other structures were seldom repeated. Further sentences displaying alternative structures (namely, IX_{3P} WHEN WORK? and WHEN WORK IX_{3P}?) were also collected, but will not be described.

3.5.2.3.1 Output C1

	<u>‘lavoro’ ‘quando’</u>	
	<u>mcd</u>	
	_____ fe	
(P21)	IX _{3P} WORK WHEN~? ‘When do they work?’ [Sentence code: 01 C1]	297, 245, 387, 239, 1129

The sentence is characterized by mouthing of *lavoro* (‘work’) over the sign WORK, and mouthing of *quando* (‘when’) over the sign WHEN. In addition, mouth corners down occur over IX_{3P}. As for non-manual markers, furrowed eyebrows occur over the entire sentence. The clause-final sign, WHEN, is subject to hold (500 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

	<u>‘loro’ ‘lavoro’ ‘quando’</u>	
	_____ fe	
	_____ qh	
(P22)	IX _{3P} WORK WHEN~? ‘When do they work?’ [Sentence code: 02 C2]	315, 311, 624, 174, 1032

The sentence is characterized by mouthing of *loro* ('they') over IX_{3P}, mouthing of *lavoro* ('work') over the sign WORK, and mouthing of *quando* ('when') over the sign WHEN. As for non-manual markers, furrowed eyebrows occur over the entire sentence. Furthermore, a question headshake occurs over the sign WHEN. The clause-final sign, WHEN, is subject to hold with handshape loosening (550 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

	<u>'lavoro' 'quando'</u>	
	<u>mcd</u>	
	_____ fe	
	_____ qh	
(P23)	IX _{3P} WORK WHEN~? 'When do they work?' [Sentence code: 03 C1]	294, 276, 489, 307, 691

The sentence is characterized by mouthing of *lavoro* ('work') over the sign WORK, and mouthing of *quando* ('when') over the sign WHEN. In addition, mouth corners down occur over the sign IX_{3P}. As for non-manual markers, furrowed eyebrows are produced over the entire sentence. Furthermore, a light and short (185 ms) question headshake occurs just before the production of the sign WHEN. The clause-final sign, WHEN, is subject to hold (350 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed, however the sentence appears somewhat stiff.

	<u>'lavoro' 'quando'</u>	
	<u>mcd</u>	
	_____ fe	
	_____ se	
	_____ qh	
(P24)	IX _{3P} WORK WHEN~? 'When do they work?' [Sentence code: 04 C4]	260, 106, 331, 167, 606

The sentence is characterized by mouthing of *lavoro* ('work') over the sign WORK, and mouthing of *quando* ('when') over the sign WHEN. In addition, mouth corners down occur over the sign IX_{3P}. As for non-manual markers, furrowed eyebrows and squinted eyes occur over the entire sentence. Furthermore, a question headshake occurs over the sign WORK and the sign WHEN. Importantly, it is to be signaled that the non-manual marker 'squinted eyes' was absent in other instances of the same sentence produced by informant 04. Since the provided context is identical, squinted eyes may thus fulfill a specific pragmatic or syntactic function triggered by that specific input sentence (i.e., C4). The clause-final sign, WHEN, is subject to final lengthening, but not to hold. Prosodic cues or pauses within the sentence are not observed.

3.5.2.3.2 Output C2

	<u>'lavoro' 'quando'</u>	
	<u>mcd</u>	
	_____ fe	
	_____ sq	
(P25)	IX _{3P} WORK WHEN IX _{3P} ~? 'When do they work?' [Sentence code: 03 C2]	325, 233, 267, 181, 186, 093, 370

The sentence is characterized by mouthing of *lavoro* ('work') over the sign WORK, and mouthing of *quando* ('when') over the signs WHEN and the clause-final IX_{3P}. In addition, mouth corners down occur over the sign IX_{3P}. As for non-manual markers, furrowed eyebrows occur over the entire sentence. Moreover, left eye and left cheek squint occur over the clause-initial IX_{3P}. The clause-final sign, IX_{3P}, appears to be hold (150 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

3.5.2.3.3 Output C3

<p style="text-align: center;"> <u>'lavoro' 'quando'</u> - _____ fe qh </p> <p>(P26) WORK WHEN IX_{3P}~? 'When do they work?' [Sentence code: 02 C3]</p>	<p>658, 147, 192, 273, 1122</p>
--	---------------------------------

The sentence is characterized by mouthing *lavoro* ('work') over the sign WORK, and mouthing spreading of *quando* ('when') over the signs WHEN and the clause-final IX_{3P}. As for non-manual markers, furrowed eyebrows start being produced towards the end of the sign WORK, and are fully produced over the sign WHEN and the clause-final IX_{3P}. Furthermore, a question headshake is produced over the sign WHEN and the clause-final IX_{3P}. The clause-final IX_{3P} is subject to hold (670 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

3.5.2.3.4 Output C4

<p style="text-align: center;"> <u>'loro' 'lavora' 'quando'</u> _____ fe qh </p> <p>(P27) IX_{3P} WORK IX_{3P} WHEN~? 'When do they work?' [Sentence code: 02 C4]</p>	<p>296, 241, 821, 210, 262, 206, 1094</p>
---	---

The sentence is characterized by mouthing of *loro* ('they') over the clause-initial IX_{3P}, mouthing of *lavora* ('work', in a truncated or uninflected form) over the sign WORK, and mouthing of *quando* ('when') over the sign WHEN. As for non-manual markers, furrowed eyebrows occur over the entire sentence, but intensify over the mid-clause IX_{3P} and the interrogative element, WHEN. Furthermore, a question headshake occurs at the beginning of the interrogative element, WHEN. The clause-final sign, WHEN, is subject to hold (330 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed: nonetheless, the sign WORK displays a particularly long duration for being a mid-sentence sign. This suggests that the sentence might be a biclausal structure such as: 'They work, but when do they (work)?'.

<p style="text-align: center;"> <u>'lavoro' 'quando'</u> mcd _____ fe qh </p> <p>(P28) IX_{3P} WORK IX_{3P} WHEN~? 'When do they work?' [Sentence code: 03 C4]</p>	<p>318, 241, 261, 197, 167, 208, 1187</p>
--	---

The sentence is characterized by mouthing spreading of *lavoro* ('work') over the sign WORK and the mid-clause IX_{3P}, and mouthing of *quando* ('when') over the sign WHEN. In addition, mouth corners down occur over the clause-initial IX_{3P}. As for non-manual markers, furrowed eyebrows occur over the entire sentence, while a question headshake occurs over the mid-clause IX_{3P} and over the sign WHEN, roughly until its hold begins. The clause-final sign, WHEN, is subject to hold (600 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

3.5.2.3.5 Output C5

 'lavoro' 'quando'
 fe
 sq
 qh
 hn+++
 eb

(P29) WORK IX_{3P} WHEN~? 499, 290, 530, 450, 954
 'When do they work?'
 [Sentence code: 02 C5]

The sentence is characterized by mouthing spreading of *lavoro* ('work') over the signs WORK and IX_{3P}, and mouthing *quando* ('when') over the sign WHEN. As for non-manual markers, a repeated headnod occurs at the end of the sign WORK and over the sign IX_{3P}, with the latter further displaying squinted eyes and squinted cheeks. In addition, an eyeblink occurs after IX_{3P}, and a brief question headshake occurs at the beginning of the sign WHEN, which is also marked by furrowed eyebrows. The sign IX_{3P} is characterized by a hold of 190 ms, whereas the sign WHEN is subject to hold (400 ms), which leads to final lengthening. Several factors, namely the presence of an eyeblink, the hold on IX_{3P}, and the length of the transition time between the signs IX_{3P} and WHEN suggests that the sentence might be a biclausal structure, such as 'They do work, but when (do they work)?'.

 'lavoro' 'quando'
 fe

(P30) WORK IX_{3P} WHEN~? 257, 177, 255, 276, 1248
 'When do they work?'
 [Sentence code: 03 C3]

The sentence is characterized by mouthing spreading of *lavoro* ('work') over the sign WORK and IX_{3P}, and mouthing *quando* ('when') over the sign WHEN. As for non-manual markers, furrowed eyebrows occur over the entire sentence. The clause-final sign, WHEN, is subject to hold (650 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

 'lavoro' 'quando'
 fe
 qh

(P31) WORK IX_{3P} WHEN? 397, 107, 226, 204, 426
 'When do they work?'
 [Sentence code: 04 C3]

The sentence is characterized by mouthing spreading of *lavoro* ('work') over the sign WORK and IX_{3P}, and mouthing *quando* ('when') over the sign WHEN. As for non-manual markers, furrowed eyebrows occur over the entire sentence. Furthermore, a question headshake occurs right before and

over the sign WHEN. The clause-final sign, WHEN, is not subject to final lengthening or hold. Prosodic cues or pauses within the sentence are not observed.

3.5.2.3.6 Informants' insights on Context C sentences

Informants expressed their difficulty in producing some of the input sentences provided (C2, C3, C4), due to a strong perceived ungrammaticality. Some of them accepted as grammatical some of the input sentences in which the third-person plural subject was replaced with a second-person singular subject (see § 3.5.3, Further data collected), whereas other did not.

3.5.2.3.7 Comment on Context C output sentences

First, comparisons from data shown in Table III.7 below should be made with caution, since for C2 and C3 only one sentence each was collected, and for C4 only two sentences (of which one with a supposed different syntactic structure) were collected. Therefore, quantitatively speaking, data are scarce. Overall, between-signs time seems not to significantly differ among the sentences, as a mean value. The main piece of data comes from the number of sentences produced, where clearly C1 and C5 are accepted at a high degree, whereas C2, C3, and C4 seem to be rarer: this suggest what a post-wh, clause-final indexical sign co-referent with the sentence subject might be subject to restrictions, to be investigated in future research.

Comparing C1 and C5, then, it can be seen that IX_{3P} has a similar mean duration (291 ms in C1, 337 ms in C5).⁵²

In Table III.7, in the following page, mean signs duration and mean between-signs time (indicated as 'time') in output sentences C1-C5 is shown.

⁵² In Context A and Context B, hold and the consequent final lengthening might have concealed the 'real' articulation time of the clause-final IX_{3P}, a crucial value to determine its nature (strong, weak, or clitic pronoun). The following mean values are obtained if one subtracts the hold duration from the clause-final IX_{3P} in sentences A3 and B3. If a comparison is made, then:

- A1, clause-initial IX_{3P}, mean duration: 338 ms
- A3, clause-final IX_{3P}, mean duration: 389 ms
- B1, clause-initial IX_{3P}, mean duration: 296 ms
- B3, clause-final IX_{3P}, mean duration: 489 ms

As can be seen, while in declarative clauses the IX_{3P} has a similar duration whether it is in the clause-initial or clause-final position, in polar interrogative clauses, the IX_{3P} has a longer duration when is in the clause-final position. More data should be collected to confirm this finding, and to verify whether it is the sentence type triggering longer durations for signs in the clause-final position.

	C1	C2	C3	C4 ⁵³	C5 ⁵⁴
IX _{3P}	291 ms	325 ms	-	307 ms	-
<i>time</i>	234 ms	233 ms	-	241 ms	-
WORK	458 ms	267 ms	658 ms	541 ms	384 ms
<i>time</i>	222 ms	181 ms	147 ms	203 ms	191 ms
IX _{3P}	-	-	-	214 ms	337 ms
<i>time</i>	-	-	-	207 ms	310 ms
WHEN	727 ms	186 ms	192 ms	1140 ms	876 ms
<i>time</i>	-	093 ms	273 ms	-	-
IX _{3P}	-	370 ms	1122 ms	-	-

Table III.7 – Mean signs duration and mean between-signs time in output sentences C1-C5.
For C2 and C3 outputs, only one sentence each was collected,
whereas for C4 output only two sentences were collected.

3.5.2.4 Declarative clause with transitive verb, NP subject, NP object (Context D)

Context D

IX₁ USUAL PLACE NEWSPAPER SELL IX₁ GO+++ . TODAY MORNING IX₁ GO SEE CL(G-G): ‘two people’ MOTHER, CHILD, YOUNG, SHY, NEWSPAPER CHOOSE ABLE-TO NOT. AT-THE-END -

‘I am used to going to the newsstand. This morning I went (there) and I saw a mother and her child, who was young and shy, and was not able to choose a newspaper. At the end –’

Input sentences for Context D:

D1 YOUNG-GUY NEWSPAPER BUY.

D2 YOUNG-GUY NEWSPAPER BUY IX_{subject}.

D3 YOUNG-GUY NEWSPAPER BUY IX_{object}.

‘The young guy bought the newspaper.’

Sentence D1 was produced by informant 01 (as an output sentence from input sentences D1, D2), informant 02 (D1), informant 03 (D1), and informant 04 (D1). Sentence D2 was produced by informant 02 (D2), and informant 03 (D2). Sentence D3 was produced by informant 01 (D3), informant 02 (D3), informant 03 (D3), and informant 04 (D3).

3.5.2.4.1 Output D1

_____ ‘ragazzo’ _____ ‘giornale’ ‘compra’
_____ mcd

(P32) YOUNG-GUY NEWSPAPER BUY~.

395, 440, 363, 339, 629

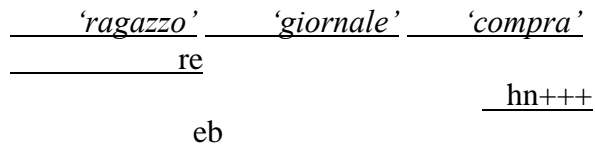
‘The young guy buys the newspaper.’

[Sentence code: 01 D1]

⁵³ C4 durations without sentence (P27), which is suspected to be a biclausal structure, are the following: 318, 241, 261, 197, 167, 208, 1187, and correspond to sentence (P28) durations.

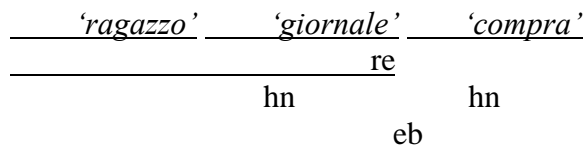
⁵⁴ C5 mean durations without sentence (P29), which is suspected to be a biclausal structure, are the following: 327, 142, 240, 240, 837, as a result of the mean between sentences (P30) and (P31) measurements.

Moreover, a repeated headnod occurs over the clause-final sign, IX_{subject}. The clause-final sign, IX_{subject}, is subject to hold (300 ms), which leads to final lengthening. As for prosodic cues, an eyeblink occurs towards the end of the sign YOUNG-GUY: this, and the presence of a relevant between-signs time after the sign YOUNG-GUY suggests an intonational break.



- (P38) YOUNG-GUY NEWSPAPER BUY IX_{subject}. 463, 540, 195, 169, 264, 207, 124
 'The young guy buys the newspaper.'
 [Sentence code: 03 D2a]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, mouthing of *giornale* ('newspaper') over the sign NEWSPAPER, and mouthing spreading of *compra* ('buy') over the sign BUY the clause-final IX_{subject}. As for non-manual markers, raised eyebrows occur over the sign YOUNG-GUY, which is followed by an eyeblink. Furthermore, the clause-final sign, IX_{subject}, is accompanied by a repeated headnod. The clause-final sign, IX_{subject}, is not subject to final lengthening or hold. As for prosodic cues, an eyeblink occurs after the sign YOUNG-GUY, after which a noticeable time can be observed (540 ms): these elements suggest the presence of an intonational break; on the other hand, no prosodic cues or pauses are observed elsewhere in the sentence.



- (P39) YOUNG-GUY NEWSPAPER BUY IX_{subject}. 393, 535, 228, 201, 232, 203, 197
 'The young guy buys the newspaper.'
 [Sentence code: 03 D2b]

The same informant produced another instance of the same sentence, which displays partially different features than (P38). First, raised eyebrows occur over both signs YOUNG-GUY and NEWSPAPER, followed by an eyeblink. Second, a single, light, headnod is produced over the sign NEWSPAPER, while another one is produced right after the sign BUY. In (P39), as well, a noticeable time (535 ms) is observed after the sign YOUNG-GUY, while a clear prosodic cue (i.e., eyeblink) occurs after the sign NEWSPAPER,⁵⁸ whereas no other prosodic cues or pauses are found elsewhere in the sentence. These suggest an intonational break and a constituent boundary. The clause-final sign, IX_{subject}, again, is not subject to final lengthening or hold.

⁵⁸ The between-signs time is short after the sign NEWSPAPER; nevertheless, a quick pause is perceptible.

3.5.2.4.3 Output D3

‘ragazzo’ ‘giornale’ ‘compra’
mcd
hrl
hd

- (P40) YOUNG-GUY NEWSPAPER BUY IX_{object}~. 428, 339, 258, 309, 139, 232, 652
 ‘The young guy buys the newspaper.’
 [Sentence code: 01 D3]

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the sign BUY and the clause-final IX_{object}. In addition, mouth corners down are observed over the signs NEWSPAPER, BUY, and the clause-final IX_{object}. As for non-manual markers, head right lean and head down occur over the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (315 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

‘ragazzo’ ‘giornale’ ‘compra’
re _ _
hn+++

- (P41) YOUNG-GUY NEWSPAPER BUY IX_{object}~. 522, 405, 561, 343, 461, 172, 1090
 ‘The young guy buys the newspaper.’
 [Sentence code: 02 D3]

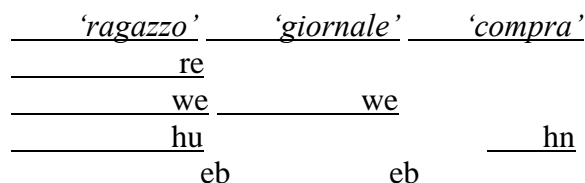
The sentence is characterized by mouthing of *ragazzo* over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the sign BUY and the clause-final IX_{object}. As for non-manual markers, eyebrows raising over the sign YOUNG-GUY – where the peak of intensity is reached – and over the rest of the sentence is observed. Furthermore, a repeated headnod is produced over the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (850 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

‘ragazzo’ ‘giornale’ ‘compra’
re
hn+++
eb

- (P42) YOUNG-GUY NEWSPAPER BUY IX_{object}. 463, 306, 360, 237, 232, 304, 296
 ‘The young guy buys the newspaper.’
 [Sentence code: 03 D3]

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the sign BUY and the clause-final indexical sign IX_{object}. As for non-manual markers, raised eyebrows occur over the sign YOUNG-GUY. Moreover, a repeated headnod is produced over the clause-final indexical sign co-referent with the object. The clause-final sign, IX_{object}, is not subject

to final lengthening or hold. As for prosodic cues, an eyeblink occurs after the sign NEWSPAPER: this, and the presence of short pauses⁵⁹ suggest the occurrence of two prosodic breaks.



(P43) YOUNG-GUY NEWSPAPER BUY IX_{object}. 342, 330, 391, 205, 196, 171, 329
 'The young guy buys the newspaper.'
 [Sentence code: 04 D3]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, mouthing of *giornale* ('newspaper') over the sign NEWSPAPER, and mouthing spreading of *compra* ('buy') over the sign BUY and the clause-final IX_{object}. As for non-manual markers, raised eyebrows, wide eyes and head up occur over the sign YOUNG-GUY. In addition, wide eyes also occur over the sign NEWSPAPER. Moreover, a single headnod occurs over the clause-final sign, IX_{object}. The clause-final sign, IX_{object}, is not subject to final lengthening or hold. As for prosodic cues, an eyeblink occurs after the sign YOUNG-GUY, and another one after the sign NEWSPAPER: these suggest the presence of two intonational breaks.

3.5.2.4.4 Informants' insights on Context D sentences

Informant 01, in relation to sentence D2 stated that he personally does not use it, although the structure is used by other signers. Moreover, in relation to sentence D3, he stated that the clause-final IX_{object} refers to a specific (kind of) newspaper.

3.5.2.4.5 Comment on Context D output sentences

Declarative clauses (transitive verb, NP subject, NP object) can occur with either a clause-final indexical sign co-referent with the subject (sentence D2) or a clause-final indexical sign co-referent with the object (sentence D3). However, while sentence D3 was produced by all informants, sentence D2 was produced only by two informants. This data, by itself, suggests that, at least with the context given, the presence of a clause-final IX_{subject} could be considered ungrammatical by some signers, or, conversely, that such a structure needs a peculiar context to be spontaneously produced. Although a syntactic ungrammaticality could be still possible – signers may differ in their judgements for instance because of diatopic variation –, if the ungrammaticality lied in syntax, a complete ruling out of the sentence would be expected.

As for non-manual markers, a certain degree of variability was observed: however, in general terms, it can be stated that the subject – and less frequently, the object – are marked by raised eyebrows. Furthermore, prosodic breaks can occur, in the form of pauses and/or eyeblinks, after the subject and the object. Finally, the clause-final indexical sign (either IX_{subject} or IX_{object}) is often accompanied by a repeated headnod which can extend as well on the verb. Interestingly, mouthing on the verb steadily spreads over the clause-final indexical sign (either IX_{subject} or IX_{object}).

⁵⁹ While the first pause is easily recognizable by the between-signs time length, especially if compared to the second value, the second one, which would probably not be identified by just looking at the measurement, is clear-cut because of the eyeblink presence and a clean, sharp signing style.

As for manual features on the clause-final indexical sign (either IX_{subject} or IX_{object}), it was seen that a hold, resulting in final lengthening can occur, although not necessarily.

In all sentences, the mean between-signs time after the subject is longer than the other two measurements. In addition, comparing sentences D1-D3, the first measurement is shorter in D3, whereas no particular differences arise in the other two. Most importantly, no pauses occur before the clause-final indexical sign (either IX_{subject} or IX_{object}).

In Table III.8 below, mean signs duration and mean between-signs time (indicated as ‘time’) in output sentences D1-D3 is shown.

	D1	D2	D3
YOUNG-GUY	443 ms	504 ms	439 ms
<i>time</i>	419 ms	508 ms	345 ms
NEWSPAPER	367 ms	316 ms	392 ms
<i>time</i>	294 ms	214 ms	273 ms
BUY	521 ms	264 ms	257 ms
<i>time</i>	-	206 ms	220 ms
IX _{subject}	-	282 ms	-
IX _{object}	-	-	592 ms

Table III.8 – Mean signs duration and mean between-signs time in output sentences D1-D3.

3.5.2.5 Declarative clause with transitive verb, NP subject, pronominal object (Context E)

Context E

PLACE NEWSPAPER SELL NEWSPAPER LAST THERE-IS.

‘At the newsstand, there is the last newspaper.’

Input sentences for Context E:

E1 YOUNG-GUY IX_{object} BUY.

E2 YOUNG-GUY IX_{object} BUY IX_{subject}.

E3 YOUNG-GUY IX_{object} BUY IX_{object}.

‘The young guy buys it.’

Sentence E1 was produced by informant 01 (as an output sentence from input sentence E1), informant 02 (E1), and informant 03 (E1). Sentence E2 was produced by informant 02 (E2) only. Sentence E3 was produced by informant 02 (E3) and informant 03 (E3).

3.5.2.5.1 Output E1

_____	‘ragazzo’	‘compra’
_____	mcd	
_____	re	fe
	hn	hn

(P44) YOUNG-GUY IX_{object} BUY.

‘The young guy buys it.’

[Sentence code: 01 E1]

256, 278, 258, 271, 397

The sentence above is characterized by mouthing spreading of *ragazzo* ('young guy') over the sign YOUNG-GUY and the pronominal object, and mouthing of *compra* ('buy') over the sign BUY. Furthermore, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows occur over the sign YOUNG-GUY, whereas a light eyebrows furrowing is observed over the sign BUY. In addition, a single headnod occurs over the pronominal object, as well as over the sign BUY. The most interesting feature in this sentence – and in others, below – is the spreading of the mouthing associated with the NP subject over the pronominal object. The clause-final sign, BUY, is not subject to final lengthening or hold. Prosodic cues or pauses within the sentence are not observed.

'ragazzo' 'comprato'
 pl
 ibr re
 hn hn+++
 eb

(P45) YOUNG-GUY IX_{object} BUY~. 597, 209, 325, 438, 890
 'The young guy buys it.'
 [Sentence code: 02 E1]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, and mouthing of *comprato* ('bought', past participle) over the sign BUY. In addition, closed and pressed lips occur over the pronominal object. As for non-manual markers, inner brow raising occurs over the sign YOUNG-GUY. In addition, eyebrows raising⁶⁰ (see image below for a comparison between the two different types of raised eyebrows in this sentence) and a single headnod occur over the IX_{object}. Moreover, a repeated headnod occurs over the sign BUY. The clause-final sign, BUY, is subject to hold (480 ms), which leads to final lengthening. As for prosodic cues, an eyeblink occurs after IX_{object}; furthermore, regardless of the actual duration, two distinct pauses are perceived (i.e., after the subject and after the object).



Figure III.5 – Inner brow raise (left) and eyebrows raising (right), as appeared in sentence (P45).

⁶⁰ Only informant 02 displayed this specific usage of eyebrows raising. The reader can take Figure III.5 as a reference for every further occurrence of *inner brow raise* and *raised eyebrows* within the same sentence described in this Chapter.

‘ragazzo’ ‘compra’
 mcd pl pl
 re re
 eb

- (P46) YOUNG-GUY IX_{object} BUY. 198, 103, 229, 340, 292
 ‘The young guy buys it.’
 [Sentence code: 03 E1]

The sentence is characterized by mouthing spreading of *ragazzo* (‘young guy’) over the sign YOUNG-GUY and the pronominal object, and by mouthing *compra* (‘buy’) over the verb. In addition, mouth corners down are observed over the sign YOUNG-GUY and the pronominal object, and closed, pressed lips are observed before and after the mouthing associated with the verb. As for non-manual markers, raised eyebrows occur over the sign YOUNG-GUY, and intensify over IX_{object}. The clause-final sign, BUY, is not subject to final lengthening or hold. As for prosodic cues, an eyeblink occurs after IX_{object}, which is also followed by a noticeable between-signs time, which is more than three times longer than the previous between-signs measurement: this, along with the eyeblink, suggest the presence of a clear intonational break.

3.5.2.5.2 Output E2

 ‘ragazzo’ ‘comprato’
 pl
 ibr re
 hn hn hn+++

- (P47) YOUNG-GUY IX_{object} BUY IX_{subject}. 361, 173, 327, 407, 428, 273, 227
 ‘The young guy buys it.’
 [Sentence code: 02 E2]

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, and mouthing spreading of *comprato* (‘bought’, past participle) over the sign BUY and the clause-final IX_{subject}. In addition, closed and pressed lips occur over the pronominal object. As for non-manual markers, inner brow raise occurs over the sign YOUNG-GUY. In addition, raised eyebrows occur over the pronominal object. Furthermore, single headnods are observed over the pronominal object and the sign BUY, whereas a repeated headnod is observed over the clause-final IX_{subject}. The clause-final sign, IX_{subject}, is not subject to final lengthening or hold. As for articulation times, a longer between-signs time is observed before the verb, and is due to a long ‘loading’ of the sign. Prosodic cues or pauses within the sentence are not observed.

3.5.2.5.3 Output E3

 ‘ragazzo’ ‘compra’
 pl
 ibr re
 hn hn+++

- (P48) YOUNG-GUY IX_{object} BUY IX_{object}. 333, 134, 367, 469, 363, 238, 231
 ‘The young guy buys it.’
 [Sentence code: 02 E3]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, and mouthing spreading of *compra* ('buy') over the sign BUY and the clause-final IX_{object}. In addition, closed and pressed lips occur over the pronominal object in argumental position. As for non-manual markers, inner brow raise occurs over the sign YOUNG-GUY. Moreover, raised eyebrows occur over the pronominal object in argumental position. Furthermore, a single headnod occurs over the pronominal object in argumental position, whereas a repeated headnod occurs over the sign BUY and the clause-final IX_{object}. The clause-final sign, IX_{object}, which is produced with a firmer movement, is not subject to final lengthening or hold. As for articulation times, as in (P47), a longer between-signs time is observed before the verb, and is due to a long 'loading' of the sign. Prosodic cues or pauses within the sentence are not observed.

<i>'ragazzo'</i>		<i>'compra'</i>	
mcd	pl	pl	pl
re		fe	
hn		hn+++	

(P49) YOUNG-GUY IX_{object} BUY IX_{object} YES. 332, 203, 162, 273, 263, 137, 128, 169, 129
 'The young guy buys it, yes.'
 [Sentence code: 03 E3]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, and mouthing spreading of *compra* ('buy') over the sign BUY, the post-verbal IX_{object} and the sign YES, spontaneously added by the signer. In addition, mouth corners down are observed over the YOUNG-GUY, whereas closed and pressed lips occur over the pronominal object in argumental position and elsewhere allowed in the remainder of the sentence. As for non-manual markers, raised eyebrows occur over the sign YOUNG-GUY, while furrowed eyebrows occur over the rest of the sentence. In addition, a single headnod is produced over the pronominal object in argumental position, whereas a repeated headnod occurs over the verb, the post-verbal IX_{object} and the sign YES. The clause-final sign, YES, is not subject to final lengthening or hold. Prosodic cues or clear pauses within the sentence are not observed.

3.5.2.5.4 Informants' insights on Context E sentences

Informant 01 stated that sentence E2 is acceptable, yet he does not use it. On the other hand, in relation to sentence E3, he stated that the clause-final IX_{object} refers to a specific newspaper. Informant 02, as for sentence E2, expressed it being not spontaneous, but rather forced as a production. Informant 03, as for sentence E3, stated that it refers to a specific newspaper. Informant 04 expressed a preference for PE_{object} instead of the pronominal object: in particular, sentence E1 with the pronominal object is dispreferred; sentence E2 is perceived as forced because of the clause-final IX_{subject}; sentence E3 with PE_{object} would not need the clause-final IX_{object} because the specificity of the object would be extremely highlighted.

3.5.2.5.5 Comment on Context E output sentences

Declarative clauses (transitive verb, NP subject, pronominal object) can occur with either a clause-final indexical sign co-referent with the subject (E2) or a clause-final indexical sign co-referent with the object (E3). However, sentence E2 was produced only by one informant, whereas sentence E3 was produced only by two informants. This data suggests that, at least with the context given, these sentences are either ungrammatical or dispreferred, for structural or contextual reasons.

As for non-manual markers, a certain degree of variability was observed: however, it can be stated that the subject – and slightly less frequently, the pronominal object – is marked by means of raised eyebrows. In addition, prosodic breaks, in the form of pauses and/or eyeblinks, can occur after the subject and the pronominal object. Finally, the clause-final indexical sign (either IX_{subject} or IX_{object}) can be accompanied by a repeated headnod, which can extend on the verb preceding it and on following signs, as well. Mouthing on the verb steadily spreads over the clause-final indexical sign (either IX_{subject} or IX_{object}). A noteworthy further phenomenon is occasional spreading of the mouthing associated with the NP subject over the following pronominal object.

As for manual features of the clause-final indexical sign (either IX_{subject} or IX_{object}), neither final lengthening nor hold were observed. However, due to the paucity of collected sentences (E2 and E3), it cannot be stated that these phenomena do not or cannot occur.

In all sentences, the mean between-signs time after the pronominal object is longer than the other two measurements. On the other hand, comparing sentences E1-E3, mean between-signs time among sentences show similar values. Most importantly, no pauses occur before the clause-final indexical sign (either IX_{subject} or IX_{object}).

In Table III.9 below, mean signs duration and mean between-signs time (indicated as ‘time’), in output sentences E1-E3 is shown.

	E1	E2	E3
YOUNG-GUY	350 ms	361 ms	333 ms
<i>time</i>	197 ms	173 ms	168 ms
IX _{object}	271 ms	327 ms	264 ms
<i>time</i>	350 ms	407 ms	371 ms
BUY	526 ms	428 ms	313 ms
<i>time</i>	-	273 ms	187 ms
IX _{subject}	-	227 ms	-
IX _{object}	-	-	231 ms ⁶¹

Table III.9 – Mean signs duration and mean between-signs time in output sentences E1-E3.

⁶¹ Only the value of (P48) was included because in (P49) the indexical sign co-referent with the object is not in the clause-final position. Therefore, the two cannot be unified and used for a comparison of durations with the clause-final indexical sign co-referent with the subject. For the sake of completeness, however, the mean duration between the two instances is 179,5 ms.

3.5.2.5.6 Further output sentences (Context E)

Among the other collected sentences in this group, noteworthy is the following variation, produced by informant 04 (with input sentences E1, E2, E3) as a preferred structure than the one proposed as an input sentence.

 ‘ragazzo’ ‘pe’ ‘compra’
 re
 we

eb

(P50) YOUNG-GUY PE_{object} BUY.

220, 247, 264, 202, 299

‘The young guy buys it.’

[Sentence code: 04 E1]

The sentence is characterized by mouthing of *ragazzo* (‘young-guy’) over the sign YOUNG-GUY, mouthing of *pe* over the sign PE_{object}, and mouthing of *compra* (‘buy’) over the sign BUY. As for non-manual features, raised eyebrows and wide eyes occur over the sign YOUNG-GUY. The clause-final sign, BUY, is not subject to final lengthening or hold. As for prosodic cues, an eyeblink is produced during the articulation of the sign PE_{object}. Further prosodic cues or pauses within the sentence are not observed.

 ‘ragazzo’ ‘pe’ ‘compra’
 re
 we we

hb eb

(P51) YOUNG-GUY PE_{object} BUY.

197, 307, 293, 276, 221

‘The young guy buys it.’

[Sentence code: 04 E2]

In (P51) above, differently from (P50), a half-eyeblick is observed before the sign PE_{object}, and wide eyes occur over the sign PE_{object}, as well, while pauses within the sentence are not observed. The clause-final sign, BUY, is again not subject to final lengthening or hold.

 ‘ragazzo’ ‘pe’ ‘compra’
 re
 we

hn+++

eb

(P52) YOUNG-GUY PE_{object} BUY.

323, 243, 330, 204, 299

‘The young guy buys it.’

[Sentence code: 04 E3]

In this other instance of the same sentence, wide eyes and eyebrows raising occur from the beginning of the sentence until the eyeblink, produced over PE_{object}. Furthermore, a repeated headnod spreads over the sign BUY. The clause-final sign, BUY, is not subject to final lengthening or hold.

A comparison between the mean durations of output sentence E1 with the pronominal object and output sentence E1 with PE_{object} is provided in Table III.10, in the following page. As it can be seen, the mean duration of IX_{object} and of PE_{object} is comparable.

	E1 (IX _{object})	E1 (PE _{object})
YOUNG-GUY	350 ms	247 ms
<i>time</i>	197 ms	266 ms
IX _{object} /PE _{object}	271 ms	296 ms
<i>time</i>	350 ms	227 ms
BUY	526 ms	273 ms

Table III.10 – Mean signs duration and mean between-signs time in output sentence E1 (with IX_{object}) and output sentence E1 (with PE_{object}).

3.5.2.6 Declarative clause with transitive verb, pronominal subject, NP object (Context F)

Context F

M-A-R-C-O IX₃ AGE 18. IX₃ INTELLIGENT CULTURED. IX₃ POLITICS LOVE. MORNING+++ IX₃ PLACE NEWSPAPER SELL GO.

‘Marco is eighteen years old. He is intelligent and cultured. He loves politics. Every morning he goes to the newsstand.’

Input sentences for Context F:

F1 IX₃ NEWSPAPER BUY.

F2 IX₃ NEWSPAPER BUY IX_{subject}.

F3 IX₃ NEWSPAPER BUY IX_{object}.

‘He buys the newspaper.’

Sentence F1 was produced by informant 01 (as an output sentence from input sentence F1 and F2), informant 02 (F1), informant 03 (F1), and informant 04 (F1, F2). Sentence F2 was produced by informant 02 (F2), and informant 03 (F2). Sentence F3 was produced by informant 01 (F3), informant 02 (F3), informant 03 (F3), and informant 04 (F3).

3.5.2.6.1 Output F1

_____ ‘*giornale*’ ‘*compra*’
_____ mcd

re

hn hn hn

(P53) IX₃ NEWSPAPER BUY~.

175, 469, 262, 338, 661

‘He buys the newspaper.’

[Sentence code: 01 F1]

The sentence is characterized by mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows occur over the sign IX₃. Furthermore, a single headnod occurs over each sign of the sentence. The clause-final sign, BUY, is subject to hold (360 ms), which leads to final lengthening. Prosodic cues within the sentence are not observed; nonetheless, a short pause can be detected after IX₃.

'giornale' 'compra'
mcd
 re
 eb

- (P54) IX₃ NEWSPAPER BUY. 162, 742, 516, 384, 521
 'He buys the newspaper.'
 [Sentence code: 02 F1]

The sentence is characterized by mouthing of *giornale* ('newspaper') over the sign NEWSPAPER, and mouthing of *compra* ('buy') over the sign BUY. In addition, mouth corners lightly down occur over the sign IX₃. As for non-manual markers, raised eyebrows occur over the sign IX₃, where they reach their peak, and over the sign NEWSPAPER. The clause-final sign, BUY, is not subject to final lengthening or hold. As for prosodic cues, an eyeblink occurs after the sign NEWSPAPER, whereas a noticeable pause occurs after the sign IX₃.

'lui' 'giornale'
 re fe
 se
 hn+++
 eb

- (P55) IX₃₊ NEWSPAPER BUY. 462, 441, 124, 211, 253
 'He buys the newspaper.'
 [Sentence code: 03 F1]

The sentence is characterized by mouthing of *lui* ('he') over the sign IX₃, and mouthing spreading of *giornale* ('newspaper') over the signs NEWSPAPER and BUY. As for non-manual markers, the sign IX₃, which displays a repeated movement, is accompanied by raised eyebrows. Moreover, slightly furrowed eyebrows and squinted eyes occur, along with a repeated headnod, over the signs NEWSPAPER and BUY. The clause-final sign, BUY, is not subject to final lengthening or hold. As for prosodic cues, the presence of an eyeblink after the sign IX₃ and a noticeable between-signs time (441 ms) after the sign IX₃ suggest a constituent boundary.

 'giornale' 'compra'
mcd
 re
 sq
 hn+++
 eb

- (P56) IX₃ NEWSPAPER BUY. 287, 330, 207, 237, 357
 'He buys the newspaper.'
 [Sentence code: 04 F1]

The sentence is characterized by mouthing of *giornale* ('newspaper') over the sign NEWSPAPER, and mouthing of *compra* ('buy') over the sign BUY. In addition, mouth corners down occur over the sign IX₃. As for non-manual markers, the sign IX₃ is accompanied by raised eyebrows and squinted eyes, and is followed by an eyeblink. In addition, a repeated headnod occurs over the sign BUY. The clause-final sign, BUY, is not subject to final lengthening or hold. As for prosodic cues, the presence of an eyeblink and a longer between-signs time after the sign IX₃ signal a prosodic pause, although moderately short.

The same signer produced another instance of the same sentence, which does not include the repeated headnod and that displays widened eyes – instead of squinted eyes – over the sign IX₃, as can be seen below.

_____ ‘*giornale*’ _____ ‘*compra*’
mcd
re
we
 eb

(P57) IX₃ NEWSPAPER BUY. 232, 241, 255, 172, 294
 ‘He buys the newspaper.’
 [Sentence code: 04 F2]

3.5.2.6.2 Output F2

_____ ‘*giornale*’ _____ ‘*compra*’
re _____ re
 eb

(P58) IX₃₊ NEWSPAPER BUY IX_{subject}. 292, 239, 630, 269, 394, 266, 404
 ‘He buys the newspaper.’
 [Sentence code: 02 F2]

The sentence is characterized by mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{subject}. As for non-manual markers, raised eyebrows occur over the sign IX₃, which also displays a repeated movement, and, with minor intensity, over the sign NEWSPAPER. The clause-final sign, IX_{subject}, is not subject to final lengthening or hold. As for prosodic cues, an eyeblink occurs after the sign IX₃, whereas pauses within the sentence are not observed.

_____ ‘*giornale*’ _____ ‘*compra*’
 _____ mcd
 _____ fe
 _____ hn+++
 eb

(P59) IX₃ NEWSPAPER BUY IX_{subject}. 131, 305, 125, 240, 193, 293, 240
 ‘He buys the newspaper.’
 [Sentence code: 03 F2]

The sentence is characterized by mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{subject}. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, furrowed eyebrows occur over the entire sentence. Furthermore, a repeated headnod occurs over the signs BUY and the clause-final IX_{subject}. The clause-final sign, IX_{subject}, is not subject to final lengthening or hold. As for prosodic cues, an eyeblink occurs after the sign BUY, whereas pauses within the sentence are not observed.

3.5.2.6.3 Output F3

 ‘giornale’ ‘compra’
 mcd
 re
hn hn+++
 eb

(P60) IX₃ NEWSPAPER BUY IX_{object}~. 196, 569, 232, 268, 192, 249, 521
‘He buys the newspaper.’
[Sentence code: 01 F3]

The sentence is characterized by mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. In addition, mouth corners down occur over the signs NEWSPAPER, BUY, and partially over the clause-final IX_{object}. As for non-manual markers, raised eyebrows and a single headnod occur over IX₃, whereas a repeated headnod occurs over the signs BUY and the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (240 ms), which leads to final lengthening. As for prosodic cues, an eyeblink and a pause occur after IX₃, signaling a prosodic break.

 ‘giornale’ ‘compra’
 re
hn hn hn+++

(P61) IX₃ NEWSPAPER BUY IX_{object}~. 097, 368, 294, 208, 261, 206, 565
‘He buys the newspaper.’
[Sentence code: 02 F3]

The sentence is characterized by mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. As for non-manual markers, raised eyebrows occur over the entire sentence, although different from those featured in polar interrogative clauses (see image below for a comparison). Furthermore, a single headnod occurs over the sign IX₃, a single headnod occurs over the sign BUY, and a repeated headnod occurs over the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (350 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.



Figure III.6 – Raised eyebrows as featured in sentence (P61), a declarative clause (left), compared with raised eyebrows featured in the corresponding polar interrogative clause (right).

‘giornale’ ‘compra’
 mcd
re fe
sc
hn hn+++
eb

(P62) IX₃ NEWSPAPER BUY IX_{object}. 288, 304, 568, 372, 260, 217, 181
‘He buys the newspaper.’
[Sentence code: 03 F3]

The sentence is characterized by mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, the sign IX₃ is marked with raised eyebrows, left cheek squint and a single headnod, and it is followed by an eyeblink, while the rest of the sentence is marked by furrowed eyebrows. Furthermore, a repeated headnod occurs over the sign BUY and the clause-final IX_{object}. The clause-final sign, IX_{object}, is not subject to final lengthening or hold. As for prosodic cues, the aforementioned eyeblink after the sign IX₃ occurs with a perceivable pause; moreover, another pause is perceived after the sign NEWSPAPER.

 ‘giorn’ ‘compra’
pl
re
se
eb eb hn+++

(P63) IX₃ NEWSPAPER BUY IX_{object}~. 198, 302, 262, 240, 260, 178, 321
‘He buys the newspaper.’
[Sentence code: 04 F3]

The sentence is characterized by mouthing of *giorn* (a truncated form for ‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. In addition, closed and pressed lips occur over the sign IX₃. As for non-manual markers, raised eyebrows and squinted eyes occur over the sign IX₃. Furthermore, a repeated headnod occurs over the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to a short hold (120 ms), which leads to a mild final lengthening. As for prosodic cues, an eyeblink occurs after the sign IX₃, and another one occurs after the sign NEWSPAPER, whereas pauses within the sentence are not observed.

3.5.2.6.4 Informants’ insights on Context F sentences

Informant 01, in relation to sentence F3, stated that the clause-final IX_{object} refers to a specific (kind of) newspaper. Informant 04, as for sentence F1, stated that the input sentence would not be spontaneous with the context given, although being grammatical *per se*: with the context provided, she would sign a sentence such as: IX₃ PA-PA NEWSPAPER PI-PI BUY+++ (translatable as: ‘He is used to buying the newspaper in that very same place’).

3.5.2.6.5 Comment on Context F output sentences

Declarative clauses (transitive verb, pronominal subject, NP object) can occur with either a clause-final indexical sign co-referent with the subject (sentence F2) or a clause-final indexical sign co-referent with the object (sentence F3). However, while sentence F3 was produced by all informants, sentence F2 was produced only by two informants. This data, by itself, suggests that, at least with the context given, the presence of a clause-final IX_{subject} could be considered ungrammatical by some signers, or, conversely, that such a structure needs a peculiar context to be spontaneously produced. Although a syntactic ungrammaticality could be still possible, if the ungrammaticality lied in syntax, a complete ruling out of the sentence would be expected.

As for non-manual markers, a certain degree of variability was observed: however, in general terms, it can be stated that the subject – and less frequently, the object – are marked by raised eyebrows. Furthermore, prosodic breaks can occur, in the form of pauses and/or eyeblinks, after the subject and the object, although more frequently observed after the subject. Finally, the clause-final indexical sign (either IX_{subject} or IX_{object}) is often accompanied by a repeated headnod which can extend as well on the verb. Interestingly, mouthing on the verb steadily spreads over the clause-final indexical sign (either IX_{subject} or IX_{object}).

As for manual features on the clause-final indexical sign (either IX_{subject} or IX_{object}), it was seen that a hold, resulting in final lengthening can occur, although not necessarily.

In all sentences, the mean between-signs time after the subject is generally longer than the other two measurements. In addition, comparing sentences F1-F3, the first measurement is shorter in F2, whereas no particular differences arise in the other two. Most importantly, no pauses occur before the clause-final indexical sign (either IX_{subject} or IX_{object}).

In Table III.11 below, mean signs duration and mean between-signs time (indicated as ‘time’) in output sentences F1-F3 is shown.

	F1	F2	F3
IX ₃	264 ms	211 ms	195 ms
<i>time</i>	445 ms	272 ms	386 ms
NEWSPAPER	273 ms	377 ms	339 ms
<i>time</i>	268 ms	254 ms	272 ms
BUY	417 ms	293 ms	243 ms
<i>time</i>	-	279 ms	212 ms
IX _{subject}	-	322 ms	-
IX _{object}	-	-	397 ms

Table III.11 – Mean signs duration and mean between-signs time in output sentences F1-F3.

3.5.2.7 Declarative clause with transitive verb, pronominal subject, pronominal object (Context G)

Context G

PLACE NEWSPAPER BUY FRIEND POSS₂ GO. NEWSPAPER CL(B): ‘newspapers on the counter’ LOOK-AT-THEM.

‘Your friend goes to the newsstand. He looks at the newspapers on the counter.’

Input sentences for Context G:

- G1 IX₃ IX_{object} BUY.
 G2 IX₃ IX_{object} BUY IX_{subject}.
 G3 IX₃ IX_{object} BUY IX_{object}.
 ‘He buys it.’

Sentence G1 was produced by informant 01 (as an output sentence from input sentence G1, G2), informant 02 (G1), informant 03 (G1), and informant 04 (G1). Sentence G2 was produced by informant 02 (G2). Sentence G3 was produced by informant 01 (G3), informant 02 (G3), and informant 03 (G3).

3.5.2.7.1 Output G1

‘compra’
 mcd

hn hn hn

(P64) IX₃ IX_{object} BUY~. 221, 506, 256, 284, 418
 ‘He buys it.’
 [Sentence code: 01 G1]

The sentence is characterized by mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, a single headnod is produced over each sign of the sentence, IX₃, IX_{object}, and BUY. The clause-final sign, BUY, is subject to a short hold (165 ms), which leads to a mild final lengthening. As for articulation times, a longer between-signs time is observed after the sign IX₃ and it is considered as the result of the signer thinking about the following part of the sentence, rather than a prosodic pause. Therefore, no prosodic cues or pauses within the sentence are observed.

‘compra’
 mcd

re _ _

hn hn hn+++

(P65) IX₃ IX_{object} BUY~. 164, 240, 227, 404, 530
 ‘He buys it.’
 [Sentence code: 02 G1]

The sentence is characterized by mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur over the signs IX₃ and IX_{object}. As for non-manual markers, raised eyebrows occur over the sign IX₃, over which they reach the peak of intensity, and the sign IX_{object}, during which production they fade. Furthermore, a single headnod occurs over at the end of the signs IX₃ and IX_{object}, respectively, whereas a repeated headnod occurs over the sign BUY. The clause-final sign, BUY, is subject to hold (229 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

‘compra’
 mcd
 re fe
 hn

- (P66) IX₃ IX_{object} BUY. 119, 124, 115, 336, 429
 ‘He buys it.’
 [Sentence code: 03 G1]

The sentence is characterized by mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down are produced over the entire sentence. As for non-manual markers, raised eyebrows occur over the signs IX₃ and IX_{object}, whereas slightly furrowed eyebrows occur over the sign BUY. Furthermore, a single headnod occurs over the sign BUY. The clause-final sign, BUY, is not subject to final lengthening or hold. Prosodic cues within the sentence are not observed, while a short pause is perceivable before the sign BUY.

 ‘compra’
 pl/lr
 re
 we
 eb

- (P67) IX₃ IX_{object} BUY. 127, 173, 191, 206, 398
 ‘He buys it.’
 [Sentence code: 04 G1]

The sentence is characterized by mouthing of *compra* (‘buy’) over the sign BUY. In addition, lower lip raising occurs over the signs IX₃ and IX_{object}, over which it is more intense. As for non-manual markers, raised eyebrows occur over the signs IX₃ and IX_{object}: in particular, they intensify over the latter. The clause-final sign, BUY, is not subject to final lengthening or hold. As for prosodic cues, an eyeblink occurs after the sign IX_{object}; on the other hand, pauses within the sentence are not observed.

3.5.2.7.2 Output G2

 ‘compra’
 re --
 hn+++

- (P68) IX₃ IX_{object} BUY IX_{subject}~. 194, 170, 228, 338, 431, 304, 663
 ‘He buys it.’
 [Sentence code: 02 G2]

The sentence is characterized by mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{subject}. As for non-manual markers, raised eyebrows occur over the signs IX₃ and IX_{object}, over which they fade. Furthermore, a repeated headnod is produced over the signs BUY and the clause-final IX_{subject}. The clause-final sign, IX_{subject}, is subject to hold (459 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

3.5.2.7.3 Output G3

	<u> </u> <u> </u> <u>‘compra’</u> <u> </u> mcd <u> </u> fe hn hn <u> </u> hn+++	
(P69)	IX ₃ IX _{object} BUY IX _{object} ~. ‘He buys it.’ [Sentence code: 01 G3]	192, 174, 230, 270, 162, 206, 496

The sentence is characterized by mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, slightly furrowed eyebrows occur over the signs BUY and the clause-final IX_{object}. Furthermore, a single headnod is produced over the sign IX₃ and the sign IX_{object}, whereas a repeated headnod is produced over the signs BUY and the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (208 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

	<u> </u> <u> </u> <u>‘compra’</u> <u> </u> cl/pl <u> </u> re _ <u> </u> we hn hn+++	
(P70)	IX ₃ IX _{object} BUY IX _{object} ~. ‘He buys it.’ [Sentence code: 02 G3]	231, 237, 165, 271, 227, 207, 896

The sentence is characterized by mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. In addition, closed and pressed lips occur over the signs IX₃ and IX_{object}. As for non-manual markers, raised eyebrows and wide eyes occur over the signs IX₃ and IX_{object}, with the latter further marked by a single headnod. Moreover, a repeated headnod occurs over the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (639 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

	<u> </u> <u> </u> <u>‘compra’</u> <u> </u> mcd <u> </u> fe hn hn	
(P71)	IX ₃ IX _{object} BUY IX _{object} ~. ‘He buys it.’ [Sentence code: 03 G3]	197, 143, 162, 299, 191, 147, 585

The sentence is characterized by mouthing of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. In addition, mouth corners down are produced over the signs IX₃, IX_{object}, and BUY. As for non-manual markers, slightly furrowed eyebrows occur over the entire sentence. Furthermore, a single headnod occurs over the sign IX_{object} and the sign BUY. The clause-final sign, IX_{object}, is subject to hold (188 ms), which leads to final lengthening.⁶² Prosodic cues or pauses within the sentence are not observed.

⁶² The clause-final IX sign seems to be endowed with a repeated movement feature. Nonetheless, the author thinks that it is not an instance of repeated movement, but rather the result of a ‘recoil movement’.

3.5.2.7.4 Informants' insights on Context G sentences

Informant 01, in relation to sentence G2, stated that he does not use it, although the structure might be used by other signers. As for G3, he pointed out that the context given was not appropriate: since the input sentence refers to a specific newspaper, the context should include a mention of a specific newspaper, or of different newspapers (e.g., 'On the counter there are three newspapers: a football newspaper, a politics newspaper, and a science newspaper.' to which sentence E3 follows, with IX_{object} spatially agreeing with the signing space assigned to the relevant newspaper). Informant 02, in relation to sentence G2, stated that the context is not optimal, since such a structure would be more natural as a reply to IX₃ BUY IX₃? ('Did he buy it?'), to confirm or highlight something related to the subject. Informant 03, in relation to sentence G2, spontaneously commented, amused: 'Trust me, he buys it, trust me!'. Therefore, sentence G2 implies a nuance of meaning such as: 'It is him, indeed!'. Informant 04, in relation to sentence G3, stated that the input sentence is acceptable, yet she prefers PE_{object} instead of the pronominal object.

3.5.2.7.5 Comment on Context G output sentences

Declarative clauses (transitive verb, pronominal subject, pronominal object) can occur with either a clause-final indexical sign co-referent with the subject (G2) or a clause-final indexical sign co-referent with the object (G3). However, sentence G2 was produced only by one informant. This data suggests that, at least with the context given, that sentence is either ungrammatical or dispreferred, for structural or contextual reasons.

As for non-manual markers, a certain degree of variability was observed: however, it can be stated that the pronominal subject – and less frequently, the pronominal object – are marked by means of raised eyebrows. Prosodic cues, in the form of pauses and/or eyeblinks, were usually absent: nonetheless, they occasionally were found after the pronominal object.

Finally, the clause-final indexical sign (either IX_{subject} or IX_{object}) can be accompanied by a repeated headnod, which can extend on the verb preceding it. Mouthing on the verb steadily spreads over the clause-final indexical sign (either IX_{subject} or IX_{object}).

As for manual features of the clause-final indexical sign (either IX_{subject} or IX_{object}), final lengthening and hold were observed in all the analyzed sentences.

In all sentences, the mean between-signs time after the pronominal object is longer than the other measurements. Most importantly, no pauses occur before the clause-final indexical sign (either IX_{subject} or IX_{object}).

In Table III.12, in the following page, mean signs duration and mean between-signs time (indicated as 'time') in output sentences G1-G3 is shown.

	G1	G2	G3
IX ₃	158 ms	194 ms	207 ms
<i>time</i>	261 ms	170 ms	185 ms
IX _{object}	197 ms	228 ms	186 ms
<i>time</i>	307 ms	338 ms	280 ms
BUY	444 ms	431 ms	193 ms
<i>time</i>	-	304 ms	187 ms
IX _{subject}	-	663 ms	-
IX _{object}	-	-	659 ms

Table III.12 – Mean signs duration and mean between-signs time in output sentences G1-G3.
For G2 output, only one sentence was collected.

3.5.2.8 Intermediate summary: declarative clause with a transitive verb

Declarative clauses with a transitive verb articulated in the neutral space (TO BUY) were tested in the following conditions as for the overt realization of arguments: NP subject, NP object (Context D); NP subject, pronominal object (Context E); pronominal subject, NP object (Context F); pronominal subject, pronominal object (Context G). For each one of them, a sentence without clause-final indexical sign (D1, E1, F1, G1), a sentence with a clause-final indexical sign co-referent with the subject (D2, E2, F2, G2), and a sentence with a clause-final indexical sign co-referent with the object (D3, E3, F3, G3) were tested for.

Collected data show that declarative clauses with a transitive verb allow for a clause-final indexical sign co-referent with either the subject or the object, regardless of their overt realization (i.e., NP argument or pronominal argument). Nonetheless, a clause-final IX_{object} was produced more frequently than a clause-final IX_{subject}, in any argument realization condition, and regardless of the referent on which the given context was focused on.

	Subject	Object	Context centered on	Number of produced sentences	
Context D	NP	NP	Young guy	D2: 3	D3: 4
Context E	NP	Pronominal	Newspaper	E2: 1	E3: 2
Context F	Pronominal	NP	Young guy	F2: 2	F3: 4
Context G	Pronominal	Pronominal	/	G2: 1	G3: 3

Table III.13 – Number of produced sentences for context given
(specified for the type of overt realization of its arguments and context focus) and sentence type.
D2, E2, F2, G2 refer to sentences with a clause-final IX_{subject}.
D3, E3, F3, G3 refer to sentences with a clause-final IX_{object}.

Informants' insights strongly suggest that context plays a crucial role for the licensing of a clause-final indexical sign: since the clause-final indexical sign function is that of highlighting or specifying a referent, it is clear that it would be impossible to do so if that referent was not previously introduced or mentioned in the discourse.⁶³

Should a tendency towards the usage of IX_{object} – and a tendency towards the avoidance of IX_{subject} – in declarative clauses be confirmed, less of contextual reasons, there might be some possible explanations: the first one is related to topichood, and the second one to a syntactic limitation. First,

⁶³ This is rather obvious: a sentence such as *He bought that newspaper*, although grammatically correct, would be naturally replied to with *Which newspaper are you talking about?*, if nothing about it was stated previously.

since in declarative clauses the referent taking the role of subject appears to be often topicalized, therefore made prominent, in sentence-initial position, a further highlighting at the end of the sentence would not be needed, hence disfavored. Conversely, the object, not being generally topicalized in sentence-initial position, displays a higher degree of freedom in being made prominent, if necessary, by means of a clause-final indexical sign. Second, there might be a syntactic restriction: for instance, if movement is involved, there might be an intervening projection blocking movement at certain conditions,⁶⁴ or other types of constraints.

3.5.2.9 Polar interrogative clause with transitive verb, NP subject, NP object (Context H)

Context H

GOOD DAY! EVERYDAY MORNING TIME EIGHT O’CLOCK YOUNG GUY IX₃ HERE NEWSPAPER SELL COME+++.

‘Good morning! Every morning at eight o’clock a young guy is used to coming here at the newsstand.’

Input sentences for Context H:

H1 YOUNG-GUY NEWSPAPER BUY?

H2 YOUNG-GUY NEWSPAPER BUY IX_{subject}?

H3 YOUNG-GUY NEWSPAPER BUY IX_{object}?

‘Does the young guy buy the newspaper?’

Sentence H1 was produced by informant 01 (as an output sentence from input sentence H1, H3), informant 02 (H1), informant 03 (H1), and informant 04 (H1). Sentence H2 was produced by informant 01 (H2), informant 02 (H2), informant 03 (H2), and informant 04 (H2). Sentence H3 was produced by informant 02 (H3) and informant 03 (H3); informants 01 and 04 provided variations featuring the sign glossed as PE, described along with the other sentences of output H3.

3.5.2.9.1 Output H1

	‘ragazzo’	‘giornale’	‘compra’	
	mcd			
	re			
(P72)	YOUNG-GUY NEWSPAPER BUY~?			457, 277, 361, 339, 996
	‘Does the young guy buy the newspaper?’			
	[Sentence code: 01 H1]			

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows occur over the entire sentence, although noticeably loosened over the sign NEWSPAPER. The clause-final sign, BUY, is subject to hold (735 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

⁶⁴ Some informants, interestingly, expressed a notion of *distance* for which, at least in declarative clauses, a clause-final IX_{subject} is rejected because of the distance between the subject, at the beginning of the sentence, and the clause-final indexical sign. Future research, with a new array of data, could attempt to better investigate this possibility.

‘ragazzo’	‘giornale’	‘compra’
	ibr	re
		we

hn

eb

(P73) YOUNG-GUY NEWSPAPER BUY~?
‘Does the young guy buy the newspaper?’
[Sentence code: 02 H1]

860, 410, 585, 247, 1230

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing of *compra* (‘buy’) over the sign BUY. As for non-manual markers, inner brow raise occurs over the signs YOUNG-GUY and NEWSPAPER, whereas raised eyebrows⁶⁵ occur over the sign BUY, also accompanied by wide eyes. The clause-final sign, BUY, is subject to hold (894 ms), which leads to final lengthening. As for prosodic cues, a single headnod and eyeblink occur right after the sign YOUNG-GUY: these, along with the between-signs time observed after the sign YOUNG-GUY, suggest the presence of a prosodic break.

‘ragazzo’	‘giornale’	‘compra’
	mcd	
	re	
	we	

(P74) YOUNG-GUY NEWSPAPER BUY~?
‘Does the young guy buy the newspaper?’
[Sentence code: 03 H1]

324, 343, 290, 243, 891

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows and wide eyes occur over the entire sentence, reaching their peak over the sign BUY. The clause-final sign, BUY, is subject to hold with loosened handshape (607 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

‘ragazzo’	‘gio’	‘compra’
	mcd	
	re	
	we	
	hn+++	

(P75) YOUNG-GUY NEWSPAPER BUY~?
‘Does the young guy buy the newspaper?’
[Sentence code: 04 H1]

259, 273, 192, 176, 962

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *gio* (a truncated form for ‘newspaper’) over the sign NEWSPAPER, and mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows and wide eyes occur over the entire sentence, reaching their peak over the sign BUY. Furthermore, a repeated headnod occurs over the sign BUY. The clause-final sign, BUY, is subject to hold with a loosened handshape (601 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

⁶⁵ The transition from inner brow raise to raised eyebrows is seamless.

3.5.2.9.2 Output H2

_____ ‘ragazzo’ _____ ‘giornale’ _____ ‘compra’

_____ mcd
_____ re

_____ hn

(P76) YOUNG-GUY NEWSPAPER BUY IX_{subject}~? 428, 606, 328, 443, 158, 303, 692
‘Does the young guy buy the newspaper?’
[Sentence code: 01 H2]

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{subject}. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows are produced over the entire sentence, although lightly over the signs YOUNG-GUY and NEWSPAPER. Furthermore, a single headnod occurs over the sign YOUNG-GUY. The clause-final sign, IX_{subject}, is subject to hold (499 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

_____ ‘ragazzo’ _____ ‘giornale’ _____ ‘compra’
_____ ibr re _____ ibr re
_____ we

(P77) YOUNG-GUY NEWSPAPER BUY IX_{subject}~? 625, 203, 659, 272, 233, 268, 1265
‘Does the young guy buy the newspaper?’
[Sentence code: 02 H2]

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{subject}. As for non-manual markers, inner brow raise and eyebrows raising occur over the sign YOUNG-GUY, inner brows raise occurs over the sign NEWSPAPER, and raised eyebrows occur over the signs BUY and the clause-final IX_{subject}. The clause-final sign, IX_{subject}, is subject to hold (1088 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

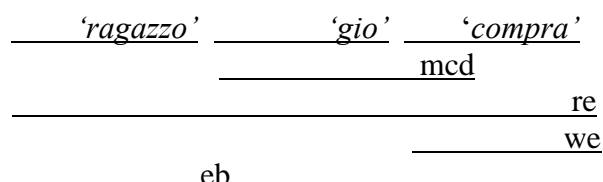
_____ ‘ragazzo’ _____ ‘giornale’ _____ ‘compra’

_____ mcd
_____ re

_____ we

(P78) YOUNG-GUY NEWSPAPER BUY IX_{subject}~? 463, 312, 156, 234, 231, 205, 495
‘Does the young guy buy the newspaper?’
[Sentence code: 03 H2]

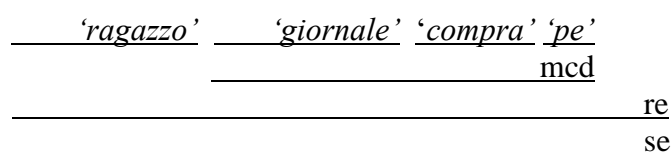
The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{subject}. In addition, mouth corners down occur over the signs NEWSPAPER, BUY, and the clause-final IX_{subject}. As for non-manual markers, raised eyebrows (slightly loosened after the sign YOUNG-GUY) and wide eyes occur over the entire sentence. The clause-final sign, IX_{subject}, is subject to hold (367 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.



(P79) YOUNG-GUY NEWSPAPER BUY IX_{subject}~? 297, 336, 262, 173, 260, 207, 631
 'Does the young guy buy the newspaper?'

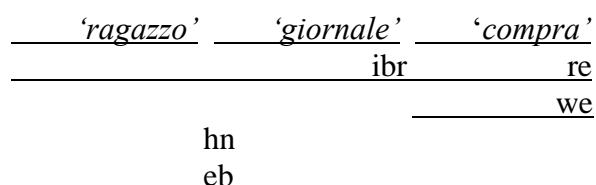
The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, mouthing of *gio* (a truncated form for 'newspaper') over the sign NEWSPAPER, and mouthing spreading of *compra* ('buy') over the signs BUY and the clause-final IX_{subject}. In addition, mouth corners down occur over the signs NEWSPAPER and BUY. As for non-manual markers, raised eyebrows occur over the entire sentence, while wide eyes occur over the signs BUY and the clause-final IX_{subject}. The clause-final sign, IX_{subject}, is subject to hold (458 ms), which leads to final lengthening. While no pauses within the sentence are observed, an eyeblink occurs after the sign YOUNG-GUY, presumably signaling a constituent boundary.

3.5.2.9.3 Output H3



(P80) YOUNG-GUY NEWSPAPER BUY PE_{object} IX_{object}~? 430, 341, 295, 369, 232, 268, 242, 65, 860
 'Does the young guy buy the newspaper?'
 [Sentence code: 01 H3]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, mouthing of *giornale* ('newspaper') over the sign NEWSPAPER, mouthing of *compra* ('buy') over the sign BUY, and mouthing of *pe* over the sign PE_{object}. In addition, mouth corners down occur over the signs NEWSPAPER, BUY, PE_{object}. As for non-manual markers, raised eyebrows occur over the entire sentence, reaching a peak of intensity at its end. Furthermore, squinted eyes occur over the signs NEWSPAPER, BUY, PE_{object} and IX_{object}. The clause-final sign, IX_{object}, is subject to hold (601 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.



(P81) YOUNG-GUY NEWSPAPER BUY IX_{object}~? 631, 471, 588, 245, 255, 145, 1355
 'Does the young guy buy the newspaper?'
 [Sentence code: 02 H3]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, mouthing of *giornale* ('newspaper') over the sign NEWSPAPER, and mouthing spreading of *compra* ('buy') over the signs BUY and the clause-final IX_{object}. As for non-manual markers, inner brow raise

occurs over the signs YOUNG-GUY and NEWSPAPER, whereas raised eyebrows⁶⁶ and wide eyes occur over the signs BUY and the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (1116 ms), which leads to final lengthening. As for prosodic cues, a single headnod and an eyeblink occur after the sign YOUNG-GUY: this, along with a noticeable between-signs time after the sign YOUNG-GUY suggests the presence of a prosodic break.

'ragazzo' 'giornale' 'compra'

mcd

re

we

(P82) YOUNG-GUY NEWSPAPER BUY IX_{object}~? 227, 342, 194, 143, 157, 175, 334
 'Does the young guy buy the newspaper?'
 [Sentence code: 03 H3]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, mouthing of *giornale* ('newspaper') over the sign NEWSPAPER, and mouthing spreading of *compra* ('buy') over the signs BUY and the clause-final IX_{object}. In addition, mouth corners down occur over the signs YOUNG-GUY and NEWSPAPER. As for non-manual markers, raised eyebrows and wide eyes occur over the entire sentence. The clause-final sign, IX_{object}, is subject to a short hold (180 ms), which leads to a mild final lengthening. Prosodic cues or pauses within the sentence are not observed.

'ragazzo' 'giornale' 'compra' 'pe'

re

we

(P83) YOUNG-GUY NEWSPAPER BUY PE_{object}~? 203, 236, 92, 176, 188, 61, 627
 'Does the young guy buy the newspaper?'
 [Sentence code: 04 H3]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, mouthing of *giornale* ('newspaper') over the sign NEWSPAPER, mouthing of *compra* ('buy') over the sign BUY, and mouthing *pe* over the sign PE_{object}. As for non-manual markers, raised eyebrows occur over the entire sentence, whereas wide eyes occur over the signs BUY and PE_{object}. The clause-final sign, PE_{object}, is subject to hold (387 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

3.5.2.9.4 Informants' insights on Context H sentences

Informant 01, in relation to sentence H3, which entails the reference to a specific newspaper, pointed out that the given context is not appropriate since there is no mention of a specific newspaper. Thus, in order for sentence H3 to be produced, the context should mention a specific newspaper. Similarly, informant 04, in relation to sentence H3, stated that, with the context given, which is centered on the subject, the sentence, which instead is focused on the object, would result as not acceptable. Furthermore, informant 04 prefers PE_{object} over the clause-final IX_{object}.

⁶⁶ The transition from inner brow raise to raised eyebrows is seamless.

3.5.2.9.5 Comment on Context H output sentences

Polar interrogative clauses (transitive verb, NP subject, NP object) can occur with either a clause-final indexical sign co-referent with the subject (sentence H2) or a clause-final indexical sign co-referent with the object (sentence H3). All informants produced sentences H2 and H3: therefore, it can be stated safely enough that both sentences are grammatical *per se* and valid with the context given. As for sentence H3, in particular, one informant added the sign PE_{object} before the clause-final IX_{object}, whereas another informant replaced the clause-final IX_{object} with the sign PE_{object}.

As for non-manual markers, a certain degree of variability was observed, in particular in relation to the presence of mouth corners down and wide eyes. Furthermore, prosodic breaks can occur, in the form of pauses and/or eyeblinks, and were observed after the subject. Finally, as for non-manual markers over the clause-final indexical sign (either IX_{subject} or IX_{object}), it appears not to be present any kind of specific non-manual marker. However, and interestingly, mouthing on the verb steadily spreads over the clause-final indexical sign (either IX_{subject} or IX_{object}), unless when the sign PE_{object}, which obligatorily requires its own mouth gesture, is present.

As for manual features on the clause-final indexical sign (either IX_{subject} or IX_{object}), it was seen in all sentences that hold, resulting in final lengthening, occurs.

In all sentences, the mean between-signs time after the subject is longer than the other two measurements. Most importantly, no pauses occur before the clause-final indexical sign (either IX_{subject} or IX_{object}).

In Table III.14 below, mean signs duration and mean between-signs time (indicated as ‘time’) in output sentences H1-H3 is shown.

	H1	H2	H3
YOUNG-GUY	475 ms	453 ms	429 ms
<i>time</i>	326 ms	364 ms	406 ms
NEWSPAPER	357 ms	351 ms	391 ms
<i>time</i>	251 ms	280 ms	194 ms
BUY	1020 ms	220 ms	206 ms
<i>time</i>	-	246 ms	160 ms
IX _{subject}	-	771 ms	-
IX _{object}	-	-	844 ms

Table III.14 – Mean signs duration and mean between-signs time in output sentences H1-H3.

3.5.2.10 Polar interrogative clause with transitive verb, NP subject, pronominal object (Context I)

Context I

OH NO! IX₁ SEE NEWSPAPER FINISHED! BUT BEFORE IX₁ ENTER IX₁ YOUNG CL(G-G):
‘one person enters, another person exits’ EXIT.

‘Oh no! The newspapers are all sold out! Well, actually I saw a young guy coming out when I got here.’

Input sentences for Context I:

- I1 YOUNG-GUY IX_{object} BUY?
 I2 YOUNG-GUY IX_{object} BUY IX_{subject}?
 I3 YOUNG-GUY IX_{object} BUY IX_{object}?
 ‘Does the young guy buy it?’

Sentence I1 was produced by informant 01 (as an output sentence from input sentence I1, I2),⁶⁷ informant 02 (I1), informant 03 (I1, with the adding of the aspectual marker DONE), and informant 04 (I1, with the substitution of IX_{object} with PE_{object}). Sentence I2 was produced by informant 02 (I2), informant 03 (I2), and informant 04 (I2, with the substitution of IX_{object} with PE_{object}). Sentence I3 was produced by informant 01 (I3, to which was added a determiner), informant 02 (I3), informant 03 (I3), and informant 04 (I3, with the substitution of IX_{object} with PE_{object}). The sentences featuring PE_{object} are described along with the ones corresponding to each output sentence.

3.5.2.10.1 Output I1

- | | | | |
|--------------------------------|---|--|--------------------------|
| <u>‘ragazzo’</u>
<u>ibr</u> | <u>‘comprato’</u>
<u>re</u>
<u>we</u> | | |
| (P84) | YOUNG-GUY IX _{object} BUY~? | | 495, 172, 230, 304, 1140 |
| | ‘Does the young guy buy it?’ | | |
| | [Sentence code: 02 I1] | | |

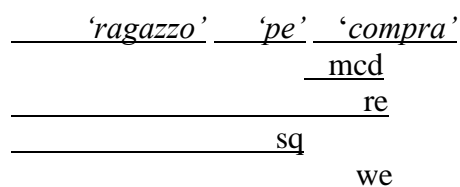
The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, and mouthing of *comprato* (‘bought’, past participle) over the sign BUY. As for non-manual markers, inner brow raise occurs over the sign YOUNG-GUY, whereas raised eyebrows⁶⁸ occur over the signs IX_{object} and BUY, with the latter also accompanied by wide eyes. The clause-final sign, BUY, is subject to hold (817 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

- | | | | |
|---|---|--|----------------------------------|
| <u>‘ragazzo’</u>
<u>re</u>
<u>hsq</u> | <u>‘comprato’</u>
<u>re</u>
<u>we</u> | | |
| (P85) | YOUNG-GUY IX _{object} BUY DONE? | | 394, 173, 197, 242, 150, 80, 225 |
| | ‘Did the young guy buy it?’ | | |
| | [Sentence code: 03 I1] | | |

The sentence is characterized by mouthing spreading of *ragazzo* (‘young guy’) over the signs YOUNG-GUY and IX_{object}, and mouthing spreading of *comprato* (‘bought’, past participle) over the signs BUY and DONE. As for non-manual markers, lightly raised eyebrows and right cheek and right eye squint occur over the sign YOUNG-GUY, whereas more intensely raised eyebrows and wide eyes occur over the signs IX_{object}, BUY, and DONE. The clause-final sign, DONE, is not subject to final lengthening or hold. Prosodic cues such as eyeblinks are absent: however, a short pause detectable after YOUNG-GUY, which, along with the change in non-manual markers, suggests a prosodic break.

⁶⁷ Probably due to an input overload or tiredness, these two sentences were produced with extremely scarce intonation and prosody. They therefore were excluded from the subsequent analysis.

⁶⁸ The transition from inner brow raise to raised eyebrows is seamless.

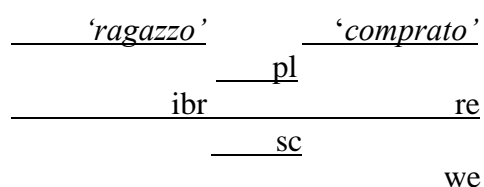


(P86) YOUNG-GUY PE_{object} BUY~?
 ‘Does the young guy buy it?’
 [Sentence code: 04 I1]

226, 239, 223, 208, 630

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *pe* over the sign PE, and mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur from right before the sign BUY and over it. As for non-manual markers, raised eyebrows occur over the entire sentence. Furthermore, while squinted eyes and squinted cheeks occur over the signs YOUNG-GUY and PE_{object}, wide eyes occur over the sign BUY. The clause-final sign, BUY, is subject to hold (259 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

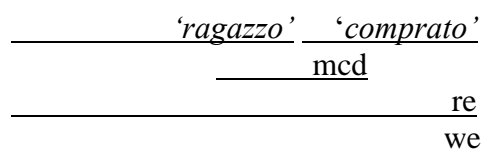
3.5.2.10.2 Output I2



(P87) YOUNG-GUY IX_{object} BUY IX_{subject}~?
 ‘Does the young guy buy it?’
 [Sentence code: 02 I2]

231, 212, 252, 412, 322, 206, 930

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, and mouthing of *comprato* (‘bought’, past participle) over the signs BUY and the clause-final IX_{subject}. In addition, closed and pressed lips occur over the sign IX_{object}. As for non-manual markers, inner brow raise occurs over the sign YOUNG-GUY, whereas raised eyebrows⁶⁹ occur over the signs IX_{object}, BUY, and the clause-final IX_{subject}. Furthermore, squinted cheeks occur over the sign IX_{object}, whereas wide eyes occur over the signs BUY and the clause-final IX_{subject}. The clause-final sign, IX_{subject}, is subject to hold (797 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.



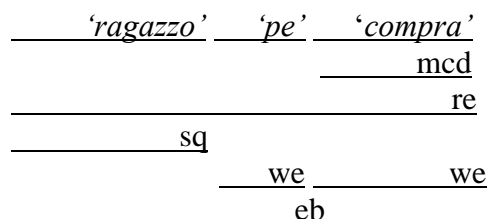
(P88) YOUNG-GUY IX_{object} BUY IX_{subject}~?
 ‘Does the young guy buy it?’
 [Sentence code: 03 I2]

187, 175, 162, 144, 155, 147, 518

The sentence is characterized by mouthing spreading of *ragazzo* (‘young guy’) over the signs YOUNG-GUY and IX_{object}, and mouthing spreading of *comprato* (‘bought’, past participle) over the signs BUY and the clause-final IX_{subject}. In addition, mouth corners down occur over the signs IX_{object}

⁶⁹ The transition from inner brow raise to raised eyebrows is seamless.

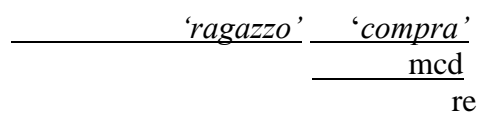
and BUY. As for non-manual markers, raised eyebrows occur over the entire sentence, intensifying after the subject. Furthermore, wide eyes occur over the signs IX_{object}, BUY, and the clause-final IX_{subject}. The clause-final sign, IX_{subject}, is subject to hold (334 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.



- (P89) YOUNG-GUY PE_{object} BUY IX_{subject}~? 205, 266, 226, 244, 189, 237, 628
 ‘Does the young guy buy it?’
 [Sentence code: 04 I2]

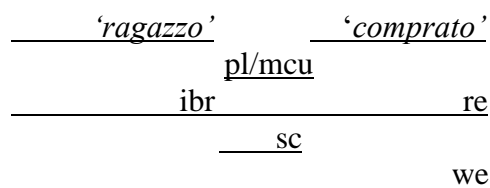
The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *pe* over the sign PE, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{subject}. In addition, mouth corners down occur over the signs BUY and the clause-final IX_{subject}. As for non-manual markers, raised eyebrows occur over the entire sentence. Furthermore, squinted eyes and cheeks accompany the sign YOUNG-GUY, whereas wide eyes mark the sign PE_{object}, followed by an eyeblink, and the signs BUY and the clause-final IX_{subject}. The clause-final sign, IX_{subject}, is subject to hold (433 ms), which leads to final lengthening. As for prosodic cues, the aforementioned eyeblink supposedly has a constituent boundary marking function; nonetheless, no pauses are observed within the sentence.

3.5.2.10.3 Output I3



- (P90) YOUNG-GUY IX_{object} BUY IX_{object}~? 358, 272, 229, 245, 121, 206, 763
 ‘Does the young guy buy it?’
 [Sentence code: 01 I3]

The sentence is characterized by mouthing spreading of *ragazzo* (‘young guy’) over the signs YOUNG-GUY and IX_{object}, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. In addition, mouth corners down occur over the signs BUY and the clause-final IX_{object}. As for non-manual markers, raised eyebrows occur over the entire sentence, intensifying in its latter part. The clause-final sign, IX_{object}, is subject to hold (553 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.



- (P91) YOUNG-GUY IX_{object} BUY IX_{object}~? 419, 238, 264, 374, 290, 182, 1354
 ‘Does the young guy buy it?’
 [Sentence code: 02 I3]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, and mouthing spreading of *comprato* ('bought', past participle) over the signs BUY and the clause-final IX_{object}. In addition, closed and pressed lips, along with mouth right corner up, occur over the sign IX_{object}. As for non-manual markers, inner brow raise occurs over the sign YOUNG-GUY, whereas raised eyebrows occur over the signs IX_{object}, BUY, and the clause-final IX_{object}. Furthermore, squinted cheeks occur over the sign IX_{object}, whereas wide eyes occur over the signs BUY and the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (1129 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

_____ '*ragazzo*' '*comprato*'
 _____ mcd
 _____ re
 _____ we

(P92) YOUNG-GUY IX_{object} BUY IX_{object}~?
 'Does the young guy buy it?'
 [Sentence code: 03 I3]

355, 316, 248, 203, 198, 175, 828

The sentence is characterized by mouthing spreading of *ragazzo* ('young guy') over the signs YOUNG-GUY and IX_{object}, and mouthing spreading of *comprato* ('bought', past participle) over the signs BUY and the clause-final IX_{object}. In addition, compatibly with mouthing, mouth corners down occur over the signs YOUNG-GUY, IX_{object}, and BUY. As for non-manual markers, raised eyebrows occur over the entire sentence, intensifying after the subject. Furthermore, wide eyes occur over the signs IX_{object} (starting towards the end of this sign), BUY, and the clause-final IX_{object}. The final-clause sign, IX_{object}, is subject to hold (628 ms), which leads to final lengthening. Although not specifically marked by means of clear prosodic cues, a pause occurs after the sign YOUNG-GUY, which suggests the presence of a constituent boundary. No other pauses, nor prosodic cues are observed within the sentence.

_____ '*ragazzo*' '*pe*' '*compra*'
 _____ mcd
 _____ re
 _____ we
 eb eb

(P93) YOUNG-GUY PE_{object} BUY IX_{object}~?
 'Does the young guy buy it?'
 [Sentence code: 04 I3]

468, 341, 291, 308, 258, 146, 658

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, mouthing of *pe* over the sign PE_{object}, and mouthing spreading of *compra* ('buy') over the signs BUY and the clause-final IX_{object}. In addition, mouth corners down occur over the signs BUY and the clause-final IX_{object}. As for non-manual markers, raised eyebrows occur over the entire sentence, intensifying after the subject. Furthermore, wide eyes also occur over the entire sentence, solely interrupted by two eyeblinks occurring respectively after the sign YOUNG-GUY and after the sign PE_{object}. The clause-final sign, IX_{object}, is subject to hold (461 ms), which leads to final lengthening. As for prosodic cues, the aforementioned eyeblinks signal constituent boundaries. No further prosodic cues or pauses are observed within the sentence.

3.5.2.10.4 Informants' insights on Context I sentences

Informant 01, in relation to sentence I2 expressed a dispreference as for the presence of the clause-final IX_{subject}, although stating that the structure could be used. Informant 04, in relation to all the sentences of this group, expressed her preference for PE_{object} instead of the pronominal object, although stating that the input sentences are grammatical.

3.5.2.10.5 Comment on Context I output sentences

Polar interrogative clauses (transitive verb, NP subject, pronominal object) can occur with either a clause-final indexical sign co-referent with the subject (sentence I2) or a clause-final indexical sign co-referent with the object (sentence I3). However, while sentence I3 was produced by all informants, sentence I2 was produced only by three informants. This data, by itself, suggests that, at least with the context given, the presence of a clause-final IX_{subject} could be considered ungrammatical by some signers, or, conversely, that such a structure needs a peculiar context to be spontaneously produced. Although a syntactic ungrammaticality could be still possible, if the ungrammaticality lied in syntax, a complete ruling out of the sentence would be expected.

As for non-manual markers, a certain degree of variability was observed: however, it can be stated that the subject and/or the object can be marked by means of squinted eyes and squinted cheeks.⁷⁰ Furthermore, prosodic breaks can occur, in the form of pauses and/or eyeblinks after the subject, where they were mostly observed, and/or the object. Finally, and interestingly, mouthing on the verb steadily spreads over the clause-final indexical sign (either IX_{subject} or IX_{object}).

As for manual features on the clause-final indexical sign (either IX_{subject} or IX_{object}), it was seen that a hold, resulting in final lengthening, occurs.

In all sentences, the mean between-signs time after the subject is not necessarily longer than the other two measurements. In addition, comparing sentences I1-I3, the first measurement is longer in I3, whereas no particular differences arise in the other two. Most importantly, no pauses occur before the clause-final indexical sign (either IX_{subject} or IX_{object}).

In Table III.15, in the following page, mean signs duration and mean between-signs time (indicated as 'time') in output sentences I1-I3 is shown.

⁷⁰ This could be a context-related factor: since in the context given the person who supposedly bought the last copy of the newspaper is somebody who is no more present in the real situation, the signer might make use of squinted eyes and cheeks to retrieve that referent or signal the retrieval of that referent (for the pragmatic function of squinted eyes, see Calderone, 2020a).

	I1 ⁷¹	I2	I3
YOUNG-GUY	495 ms	209 ms	377 ms
<i>time</i>	172 ms	193 ms	275 ms
IX _{object}	230 ms	207 ms	247 ms
<i>time</i>	304 ms	278 ms	274 ms
BUY	1140 ms	238 ms	203 ms
<i>time</i>	-	176 ms	188 ms
IX _{subject}	-	724 ms	-
IX _{object}	-	-	982 ms

Table III.15 – Mean signs duration and mean between-signs time in output sentences I1-I3.

3.5.2.11 Polar interrogative clause with transitive verb, pronominal subject, NP object (Context J)

Context J

PLACE NEWSPAPER SELL FRIEND POSS₂ EVERYDAY GO+++.

‘Everyday your friend goes to the newsstand.’

Input sentences for Context J:

J1 IX₃ NEWSPAPER BUY?

J2 IX₃ NEWSPAPER BUY IX_{subject}?

J3 IX₃ NEWSPAPER BUY IX_{object}?

‘Does he buy the newspaper?’

Sentence J1 was produced by informant 01 (as an output sentence from input sentence J1), informant 02 (J1), informant 03 (J1), and informant 04 (J1). Sentence J2 was produced by informant 01 (J2), informant 02 (J2), informant 03 (J2), and informant 04 (J2). Sentence J3 was produced by informant 01 (J3), informant 02 (J3), informant 03 (J3), and informant 04 (J3).

3.5.2.11.1 Output J1

 ‘giornale’ ‘compra’
 mcd
 re re
hn

(P94) IX₃ NEWSPAPER BUY~? 258, 539, 262, 349, 923
‘Does he buy the newspaper?’
[Sentence code: 01 J1]

The sentence is characterized by mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur over the signs NEWSPAPER and BUY. As for non-manual markers, raised eyebrows occur over IX₃, also marked by a single headnod, and more intensely on the sign BUY. The clause-final sign, BUY, is subject to hold with a loosened handshape (571 ms), which leads to final lengthening. As for prosodic cues, the length of the between-signs time after IX₃, along with the presence of a headnod, suggests a constituent boundary. No other prosodic cues or pauses are observed within the sentence.

⁷¹ Sentence (P84) was not included because of the sign DONE, whose presence interferes with timings.

- ‘giornale’ ‘compra’
 re re
 we
- (P95) IX₃ NEWSPAPER BUY~? 158, 309, 258, 249, 753
‘Does he buy the newspaper?’
[Sentence code: 02 J1]

The sentence is characterized by mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing of *compra* (‘buy’) over the sign BUY. As for non-manual markers, raised eyebrows occur over IX₃, and over the sign BUY, over which wide eyes also occur. The clause-final sign, BUY, is subject to hold (332 ms), which leads to final lengthening. Prosodic cues or pauses are within the sentence are not observed.

- ‘giornale’ ‘compra’
 mcd
 fe re
 sc
 we
- (P96) IX₃ NEWSPAPER BUY~? 204, 203, 299, 273, 790
‘Does he buy the newspaper?’
[Sentence code: 03 J1]

The sentence is characterized by mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, furrowed eyebrows and right cheek squint occur over the sign IX₃, whereas raised eyebrows occur over the signs NEWSPAPER and BUY. Furthermore, wide eyes occur from towards the end of the sign NEWSPAPER and over the sign BUY. The clause-final sign, BUY, is subject to hold with a loosened handshape (522 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

- ‘giornale’ ‘compra’
 mcd
 re
 we
- (P97) IX₃ NEWSPAPER BUY~? 185, 251, 159, 207, 554
‘Does he buy the newspaper?’
[Sentence code: 04 J1a]

The sentence is characterized by mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows and wide eyes occur over the entire sentence. The clause-final sign, BUY, is subject to hold (250 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

The same informant also provided another sentence, described as the one she would use in context given.

‘gio’ ‘compra’
 mcd
 re
 we
 hn hn+++

(P98) NEWSPAPER BUY IX_{subject}~?
 ‘Does he buy the newspaper?’
 [Sentence code: 04 J1b]

183, 217, 251, 124, 760

The sentence is characterized by mouthing of *gio* (a truncated form for ‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{subject}. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows and wide eyes occur over the entire sentence. Furthermore, a single headnod occur over the sign NEWSPAPER, and a repeated headnod occurs over the sign BUY. The clause-final sign, IX_{subject}, is subject to hold (571 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

3.5.2.11.2 Output J2

 ‘giornale’ ‘compra’
 mcd
 re

(P99) IX₃ NEWSPAPER BUY IX_{subject}~?
 ‘Does he buy the newspaper?’
 [Sentence code: 01 J2a]

263, 171, 227, 180, 85, 240, 663

The sentence is characterized by mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{subject}. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows occur over the entire sentence, and intensify after the subject. The clause-final sign, IX_{subject}, is subject to hold (471 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

The same informant also provided another instance of the same core sentence, which would be used in a context in which the signer expresses disbelief about the event (i.e., the fact that the subject bought a newspaper). Notice the difference in non-manual markers.

‘lui’ ‘giornale’ ‘compra’ ‘impossibile’ ‘lui’
 mcd mcd
 fe fe
 sq sq

(P100) IX₃ NEWSPAPER BUY IX_{subject}~? – IMPOSSIBLE! IX_{subject}~???

192, 311, 161, 209, 141, 252, 355 – 484, 266, 443

‘Does he buy the newspaper?’
 [Sentence code: 01 J2b]

The sentence is characterized by mouthing of *lui* (‘he’) over the sign IX₃, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{subject}. In addition, mouth corners down occur over the signs IX₃, NEWSPAPER, and BUY. As for non-manual markers, furrowed eyebrows and squinted eyes and

The sentence is characterized by mouthing of *giornale* ('newspaper') over the sign NEWSPAPER, and mouthing spreading of *compra* ('buy') over the signs BUY and the clause-final IX_{object}. In addition, mouth corners down occur over the signs IX₃, NEWSPAPER, and BUY, compatibly with mouthing. As for non-manual markers, furrowed eyebrows occur over the sign IX₃, also marked by squinted eyes and cheeks, and the sign NEWSPAPER, whereas raised eyebrows occur over the signs BUY and the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (496 ms), which leads to final lengthening. Prosodic cues within the sentence are not observed, whereas a pause is perceived after the sign NEWSPAPER, due to a short hold, which suggests the presence of a prosodic break.

_____ 'gio' _____ 'compra'
 _____ mcd
 _____ re
 _____ we

(P107) IX₃ NEWSPAPER BUY IX_{object}?
 'Does he buy the newspaper?'
 [Sentence code: 04 J3]

151, 146, 64, 201, 198, 141, 591

The sentence is characterized by mouthing of *gio* (a truncated form for 'newspaper') over the sign NEWSPAPER, and mouthing spreading of *compra* ('buy') over the signs BUY and the clause-final IX_{object}. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows and wide eyes occur over the entire sentence. The clause-final sign, IX_{object}, is subject to hold (371 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

3.5.2.11.4 Informants' insights on Context J sentences

Informant 01, as for sentence J2, stated that it would be used to express surprise or disbelief about a fact. Informant 04, in relation to sentence J1, stated that although the input sentence is grammatical *per se*, it would not be the most appropriate choice with the given context: on the contrary, a more appropriate sentence would be NEWSPAPER BUY IX_{subject}? (see (P97) above). Furthermore, as for sentence J3, informant 04 stated that the sentence is grammatical *per se*, but it is not appropriate with the given context, which is centered on the subject (whereas the sentence focuses on the object), for which sentence J2 would be the most suitable choice.

3.5.2.11.5 Comment on Context J output sentences

Polar interrogative clauses (transitive verb, pronominal subject, NP object) can occur with either a clause-final indexical sign co-referent with the subject (sentence J2) or a clause-final indexical sign co-referent with the object (sentence J3). All informants produced sentences H2 and H3: therefore, it can be stated safely enough that both sentences are grammatical *per se* and valid with the context given.

As for non-manual markers, a certain degree of variability was observed, for instance as for mouth corners down and wide eyes. In particular, the subject is sometimes marked with furrowed eyebrows and/or squinted eyes, whereas the object is rarely so. Furthermore, prosodic breaks can occur, in the form of pauses and/or eyeblinks, after the subject, where they were mostly observed, and after the object. Finally, and interestingly, mouthing on the verb steadily spreads over the clause-final indexical sign (either IX_{subject} or IX_{object}).

As for manual features on the clause-final indexical sign (either IX_{subject} or IX_{object}), it was seen that a hold, resulting in final lengthening, occurs.

In all sentences, the mean between-signs time after the subject is longer than the other two measurements. In addition, comparing sentences J1-J3, the first measurement is shorter in J2. Most importantly, no pauses occur before the clause-final indexical sign (either IX_{subject} or IX_{object}).

In Table III.16 below, mean signs duration and mean between-signs time (indicated as ‘time’) in output sentences J1-J3 is shown.

	J1	J2	J3
IX_{subject}	201 ms	219 ms	238 ms
<i>time</i>	325 ms	271 ms	301 ms
NEWSPAPER	244 ms	238 ms	223 ms
<i>time</i>	269 ms	228 ms	216 ms
BUY	755 ms	193 ms	220 ms
<i>time</i>	-	264 ms	193 ms
IX_{subject}	-	640 ms	-
IX_{object}	-	-	998 ms

Table III.16 – Mean signs duration and mean between-signs time in output sentences J1-J3.

3.5.2.12 Polar interrogative clause with transitive verb, pronominal subject, pronominal object (Context K)

Context K

PLACE NEWSPAPER SELL FRIEND POSS GO. NEWSPAPER CL(B): ‘newspapers on the counter’ IX_3 EYE-CAUGHT ONE.

‘Your friend goes to the newsstand. He is eye-caught by one of the newspapers on the counter.’

Input sentences for Context K:

K1 IX_3 IX_{object} BUY?

K2 IX_3 IX_{object} BUY IX_{subject} ?

K3 IX_3 IX_{object} BUY IX_{object} ?

‘Does he buy it?’

Sentence K1 was produced by informant 01 (as an output sentence from input sentence K1, K2), informant 02 (K1), informant 03 (K1), and informant 04 (K1). Sentence K2 was produced by informant 02 (K2) and informant 03 (K2). Sentence K3 was produced by informant 01 (K3), informant 02 (K3), informant 03 (K3), and informant 04 (K3). Informant 04 also provided sentences featuring the sign PE_{object} in place of the pronominal object (K1, K2, K3), described along with the ones featuring the pronominal object.

3.5.2.12.1 Output K1

$\begin{array}{c} \underline{\text{'lui'}} \quad \underline{\text{'compra'}} \\ \underline{\text{mcd}} \\ \underline{\text{re}} \end{array}$	
(P108) IX ₃ IX _{object} BUY~?	191, 663, 271, 309, 592
‘Does he buy the newspaper?’	
[Sentence code: 01 K1]	

The sentence is characterized by mouthing of *lui* (‘he’) over the sign IX₃, and mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur over the entire sentence, and are more visible on the sign IX_{object} and the sign BUY. As for non-manual markers, raised eyebrows occur over the entire sentence, although unstable at the beginning. The clause-final sign, BUY, is subject to hold (370 ms), which leads to final lengthening. Prosodic cues within the sentence are not observed, whereas a pause is perceived after the sign IX₃.

$\begin{array}{c} \underline{\text{'compra'}} \\ \underline{\text{ibr}} \quad \underline{\text{re}} \\ \underline{\text{we}} \end{array}$	
(P109) IX ₃ IX _{object} BUY~?	191, 270, 199, 338, 855
‘Does he buy the newspaper?’	
[Sentence code: 02 K1]	

The sentence is characterized by mouthing of *compra* (‘buy’) over the sign BUY. As for non-manual markers, inner brows raise occurs over the sign IX₃, while raised eyebrows occur over the signs IX_{object} and BUY. In addition, wide eyes occur over the entire sentence. The clause-final sign, BUY, is subject to hold with handshape loosening (554 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

$\begin{array}{c} \underline{\text{'compra'}} \\ \underline{\text{mcd}} \\ \underline{\text{re}} \\ \underline{\text{we}} \\ \underline{\text{hn+++}} \end{array}$	
(P110) IX ₃ IX _{object} BUY~?	193, 163, 164, 288, 747
‘Does he buy the newspaper?’	
[Sentence code: 03 K1]	

The sentence is characterized by mouthing of *compra* (‘buy’) over the sign BUY. In addition, mouth corners down occur over the sign IX₃. As for non-manual markers, raised eyebrows occur over the entire sentence. Furthermore, wide eyes occur over the sign IX_{object} and the sign BUY, the latter also marked with a repeated headnod. The clause-final sign, BUY, is subject to hold with handshape loosening (424 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

‘compra’
pl mcd
 re
 we

(P111) IX₃ IX_{object} BUY~? 166, 200, 141, 238, 724
 ‘Does he buy the newspaper?’
 [Sentence code: 04 K1a]

The sentence is characterized by mouthing of *compra* (‘buy’) over the sign BUY. In addition, closed and pressed lips occur over the sign IX₃, and mouth corners down occur over the signs IX_{object} and BUY. As for non-manual markers, raised eyebrows and wide eyes occur over the entire sentence. The clause-final sign, BUY, is subject to hold (321 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

The same informant provided a sentence featuring PE_{object}, as a preferred version.

 ‘pe’ ‘compra’
pl mcd
 re
sc sq
we we

(P112) IX₃ PE_{object} BUY~? 148, 206, 291, 253, 712
 ‘Does he buy the newspaper?’
 [Sentence code: 04 K1b]

The sentence is characterized by mouthing of *pe* over the sign PE_{object}, and mouthing of BUY over the sign BUY. In addition, closed and pressed lips occur over the sign IX₃, whereas mouth corners down occur over the signs PE_{object} and BUY. As for non-manual markers, raised eyebrows occur over the entire sentence. Furthermore, wide eyes and squinted cheeks occur over the sign IX₃, squinted eyes and squinted cheeks occur over the sign PE_{object}, and wide eyes occur over the sign BUY. The clause-final sign, BUY, is subject to a short hold (183 ms), which leads to a mild final lengthening. Prosodic cues or pauses within the sentence are not observed: moreover, the between-signs times are comparable to those of sentence (P110).

3.5.2.12.2 Output K2

 ‘compra’
 re
 we
 hn+++

(P113) IX₃ IX_{object} BUY IX_{subject}~? 127, 240, 120, 322, 385, 281, 1310
 ‘Does he buy the newspaper?’
 [Sentence code: 02 K2]

The sentence is characterized by mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{subject}. As for non-manual markers, raised eyebrows and wide eyes occur over the entire sentence. In addition, a repeated headnod occurs over the sign BUY. The clause-final sign, IX_{subject}, is subject to hold (1068 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

‘compra’
 mcd mcd/pl
 fe re
 we

(P114) IX₃ IX_{object} BUY IX_{subject}~? 129, 178, 181, 174, 144, 200, 1050
 ‘Does he buy the newspaper?’
 [Sentence code: 03 K2a]

The sentence is characterized by mouthing spreading of *compra* (‘buy’) over the sign BUY and the clause-final IX_{subject}. In addition, mouth corners down occur over the entire sentence, compatibly with mouthing; moreover, mouth corners down with pressed lips occur at the end of the sentence.⁷² As for non-manual markers, furrowed eyebrows occur over the sign IX₃, whereas raised eyebrows and wide eyes occur over the signs IX_{object}, BUY, and the clause-final IX_{subject}. The clause-final sign, IX_{subject}, is subject to hold (841 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

3.5.2.12.3 Output K3

 ‘compra’
 mcd
 re

(P115) IX₃ IX_{object} BUY IX_{object}~? 260, 243, 214, 288, 152, 281, 1123
 ‘Does he buy the newspaper?’
 [Sentence code: 01 K3]

The sentence is characterized by mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. In addition, mouth corners down occur over the entire sentence. As for non-manual markers, raised eyebrows occur over the entire sentence, being however at the least of perceptibility over the signs IX₃ and IX_{object}, and intensifying over the signs BUY and the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (863 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

 ‘compra’
 ibr re
 we

(P116) IX₃ IX_{object} BUY IX_{object}~? 158, 237, 163, 301, 183, 190, 1293
 ‘Does he buy the newspaper?’
 [Sentence code: 02 K3]

The sentence is characterized by mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. As for non-manual markers, inner brow raise occur over the signs IX₃ and IX_{object}, whereas raised eyebrows and wide eyes occur over the signs BUY and the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (1070 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

⁷² The informant herself noticed this peculiarity and explained that the marker was produced spontaneously.

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(P117)	IX ₃ IX _{object} BUY IX _{object} ~?	121, 210, 117, 186, 187, 147, 684
	‘Does he buy the newspaper?’	
	[Sentence code: 03 K3]	

The sentence is characterized by mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. In addition, mouth corners down occur over the signs IX₃ and IX_{object}. As for non-manual markers, raised eyebrows occur over the entire sentence, and intensify over the signs BUY and the clause-final IX_{object}, which are also marked by wide eyes. The clause-final sign, IX_{object}, is subject to hold (423 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

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(P118)	IX ₃ IX _{object} BUY IX _{object} ~?	158, 233, 105, 175, 158, 173, 428
	‘Does he buy the newspaper?’	
	[Sentence code: 04 K3a]	

The sentence is characterized by mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. In addition, pressed lips with mouth corners up occur over the sign IX₃. As for non-manual markers, raised eyebrows occur over the entire sentence, and intensify over the signs BUY and the clause-final IX_{object}. Furthermore, squinted eyes and cheeks occur over the sign IX₃, whereas wide eyes occur over the signs IX_{object}, BUY, and the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to hold (240 ms), which leads to final lengthening. Prosodic cues or pauses within the sentence are not observed.

The same informant also provided the same sentence with PE_{object} in place of the pronominal object, stating this sentence would be preferred.

	<u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u>	
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(P119)	IX ₃ PE _{object} BUY IX _{object} ~?	149, 207, 225, 211, 192, 185, 347
	‘Does he buy the newspaper?’	
	[Sentence code: 04 K3b]	

The sentence is characterized by mouthing of *pe* over the sign PE_{object}, and mouthing spreading of *compra* (‘buy’) over the signs BUY and the clause-final IX_{object}. As for non-manual markers, raised eyebrows occur over the entire sentence, although very lightly on the sign IX₃. In addition, squinted eyes occur over the sign IX₃, whereas wide eyes occur over the signs PE_{object}, BUY, and the clause-final IX_{object}. The clause-final sign, IX_{object}, is subject to a short hold (192 ms), which leads to a mild final lengthening. Prosodic cues or pauses within the sentence are not observed.

3.5.2.12.4 Informants' insights on Context K sentences

Informant 01, in relation to sentence K3, commented that it would be used to ask for confirmation about the (specific) newspaper, roughly as in: 'This newspaper, right?'. Informant 03, in relation to sentence K3, which she produced, stated that the structure is made heavy by the clause-final IX_{object}, and that, therefore, a sentence equivalent to K1 would be more appropriate. Informant 04 considers sentence K1 grammatical: however, she would prefer PE_{object} over the pronominal object, since the former is more specific (which is probably a preference derived from the context given, which highlights a single newspaper); sentence K2 was considered ungrammatical for the abundance of indexical signs; sentence K3 was considered as grammatical, yet the signer preferred PE_{object} over the pronominal object.

3.5.2.12.5 Comment on Context K output sentences

Polar interrogative clauses (transitive verb, pronominal subject, pronominal object) can occur with either a clause-final indexical sign co-referent with the subject (sentence K2) or a clause-final indexical sign co-referent with the object (sentence K3). However, while sentence K3 was produced by all informants, sentence K2 was produced only by two informants. This data, by itself, suggests that, at least with the context given, the presence of a clause-final IX_{subject} could be considered ungrammatical by some signers, or, conversely, that such a structure needs a peculiar context to be spontaneously produced. Although a syntactic ungrammaticality could be still possible, if the ungrammaticality lied in syntax, a complete ruling out of the sentence would be expected.

As for non-manual markers, a certain degree of variability was observed, for instance on the presence of mouth corners down and wide eyes. In some cases, the subject was marked by furrowed eyebrows or squinted eyes. Furthermore, prosodic breaks or pauses after the subject or the object were not observed. Finally, and interestingly, mouthing on the verb steadily spreads over the clause-final indexical sign (either IX_{subject} or IX_{object}).

As for manual features on the clause-final indexical sign (either IX_{subject} or IX_{object}), it was seen that a hold, resulting in final lengthening, occurs.

In all sentences, the mean between-signs time after the subject is not necessarily longer than the other two measurements. In addition, comparing sentences K1-K3, while a certain variation is observed for the first measurement, no particular differences arise in the other two. Most importantly, no pauses occur before the clause-final indexical sign (either IX_{subject} or IX_{object}).

In Table III.17, in the following page, mean signs duration and mean between-signs time (indicated as 'time') in output sentences K1-K3 is shown.

	K1	K2	K3
IX _{subject}	185 ms	128 ms	174 ms
<i>time</i>	324 ms	209 ms	231 ms
IX _{object}	194 ms	150 ms	150 ms
<i>time</i>	293 ms	248 ms	237 ms
BUY	729 ms	264 ms	171 ms
<i>time</i>	-	240 ms	198 ms
IX _{subject}	-	1180 ms	-
IX _{object}	-	-	882 ms

Table III.17 – Mean signs duration and mean between-signs time in output sentences K1-K3.

3.5.2.13 Intermediate summary: polar interrogative clause with a transitive verb

Polar interrogative clauses with a transitive verb articulated in the neutral space (TO BUY) were tested in the following conditions as for the overt realizations of arguments: NP subject, NP object (Context H); NP subject, pronominal object (Context I); pronominal subject, NP object (Context J); pronominal subject, pronominal object (Context K). For each one of them, a sentence without clause-final indexical sign (H1, I1, J1, K1), a sentence with a clause-final indexical sign co-referent with the subject (H2, I2, J2, K2), and a sentence with a clause-final indexical sign co-referent with the object (H3, I3, J3, K3) were tested for.

Collected data show that polar interrogative clauses with a transitive verb allow for a clause-final indexical sign co-referent with either the subject or the object, regardless of their overt realization (i.e., NP argument or pronominal argument). Clause-final indexical signs were almost always produced, in some cases with a slightly higher frequency for clause-final IX_{object}s, in any argument realization condition, and regardless of the referent on which the given context was focused on. Overall, clause-final indexical signs were produced more frequently than in declarative clauses with a transitive verb (see § 3.5.2.8 for a comparison).

	Subject	Object	Context centered on	Number of produced sentences	
Context H	NP	NP	Young guy	H2: 4	H3: 4
Context I	NP	Pronominal	Young-guy	I2: 3	I3: 4
Context J	Pronominal	NP	Young guy	J2: 4	J3: 4
Context J	Pronominal	Pronominal	Newspaper	K2: 2	K3: 4

Table III.18 – Number of produced sentences for context given (specified for the type of overt realization of its arguments and context focus) and sentence type.
H2, I2, J2, K2 refer to sentences with a clause-final IX_{subject}.
H3, I3, J3, K3 refer to sentences with a clause-final IX_{object}.

Informants' insights strongly suggest that context plays a crucial role for the licensing of a clause-final indexical sign: since the clause-final indexical sign function is that of highlighting or specifying a referent, it is clear that it would be impossible to do so if that referent was not previously introduced or mentioned in the discourse. For instance, as for sentences H3 and J3, some informants stated that a context centered on the newspaper would be needed in order for those sentences to be acceptable.⁷³

⁷³ Those sentences were still produced since they were grammatical *per se*.

Differently from declarative clauses with a transitive verb (see § 3.5.2.4 to § 3.5.2.8), it seems that polar interrogative clauses equally allow for a clause-final IX_{subject} and a clause-final IX_{object} – or, differently put, that they do not disfavor the clause-final IX_{subject} , as declarative clauses seemingly do. Should sentence type play a specific role as for (dis)allowing a clause-final indexical sign, a first, possible explanation could be intertwined with topicality. It could be supposed that since topics and polar interrogative clauses have some common non-manual markers – in particular, raised eyebrows – in a polar interrogative clause the former might be ‘concealed’: being less recognizable, it is therefore highlighted through the clause-final indexical sign. Thus, since the topicalized constituent often corresponds with the sentence subject, the need to have it somewhat highlighted would be fulfilled with the clause-final indexical sign, hence both the grammaticality and common usage, in polar interrogative clauses, of a clause-final indexical sign co-referent with the subject.⁷⁴ On the other hand, also non-topicalized constituents can be highlighted, if needed, by means of a clause-final indexical sign.

3.5.2.14 Content interrogative clause with transitive verb (Context L)

Context L

HOUSE IN-FRONT-OF POSS₂ IX_{3P} PEOPLE HABIT POSS_{3P}. IX₂ TIME-AGO₂ TELL₁ FATHER_A IX_A EVERY-MONDAY CAFÉ GO, MOTHER EVERY-TUESDAY GYM GO. INSTEAD SON_B IX_B NEWSPAPER BUY WEEK DAY WHICH IX₁ KNOW NOT.

‘Your neighbors have their habits. Once you told me that the father goes to the café every Monday and that the mother goes to the gym every Tuesday. Their son buys the newspaper, but I do not know in which day of the week.’

Input sentences for Context L:

- L1 YOUNG-GUY NEWSPAPER BUY WHEN?
 - L2 YOUNG-GUY NEWSPAPER BUY WHEN IX_{subject} ?
 - L3 YOUNG-GUY NEWSPAPER BUY WHEN IX_{object} ?
 - L4 YOUNG-GUY NEWSPAPER BUY IX_{subject} WHEN?
 - L5 YOUNG-GUY NEWSPAPER BUY IX_{object} WHEN?
- ‘When does the young guy buy the newspaper?’

Sentence L1 was produced by informant 01 (as an output sentence from input sentence L1, L2, L3, L4), informant 02 (L1, L2, L3), informant 03 (L1), informant 04 (L1, L2, L3, L5). Sentence L2 was produced by informant 03 (L2, L4). Sentence L3 was not produced by any informant. Sentence L4 was produced by informant 02 (L4), informant 03 (L4), informant 04 (L4). Sentence L5 was produced by informant 01 (L3), informant 03 (L3, L5).

⁷⁴ Albeit, as described in Chapter 4 § 4.5.1, one of the pragmatic purposes of clause-final indexical signs is topic agreement, the process here (and earlier in § 3.5.2.8) outlined would not be able to explain, for instance, polar interrogative clauses such as (P98) – unless one conjectures a covert topic agreement. Although the intuition might be overall correct, in Chapter 4, it will be set aside.

leads to final lengthening. Prosodic cues within the sentence are not observed, however a pause after IX₃ is clearly perceived, as can be also inferred from the noticeable between-signs time (515 ms).

‘ragazzo’ ‘giorna’ ‘quando’

 _____ fe
 _____ qh

(P123) YOUNG-GUY NEWSPAPER BUY WHEN? 158, 208, 66, 202, 223, 250, 387
 ‘When does the young guy buy the newspaper?’
 [Sentence code: 04 L1]

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing spreading of *giorna* (a truncated form for ‘newspaper’) over the signs NEWSPAPER and BUY, and mouthing of *quando* (‘when’) over the sign WHEN. As for non-manual markers, furrowed eyebrows occur over the entire sentence. Furthermore, question headshake occurs over the signs BUY and WHEN. The clause-final sign, WHEN, is not subject to final lengthening and hold. Prosodic cues and pauses within the sentence are not observed.

3.5.2.14.2 Output L2

‘ragazzo’ ‘giornale’ ‘compra’ ‘quando’

 _____ mcd _____ mcd
 _____ fe

(P124) YOUNG-GUY NEWSPAPER BUY WHEN IX_{subject}~? 225, 412, 156, 314, 222, 182, 309, 254, 644
 ‘When does the young guy buy the newspaper?’
 [Sentence code: 03 L2]

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, mouthing of *compra* (‘buy’) over the sign BUY, and mouthing of *quando* (‘when’) over the sign WHEN. In addition, mouth corners down occur over the signs NEWSPAPER and the clause-final IX_{subject}. As for non-manual markers, furrowed eyebrows occur over the entire sentence. The clause-final sign, IX_{subject}, is subject to hold (394 ms), which leads to final lengthening. Prosodic cues within the sentence are not observed: nonetheless, at least one pause is perceived after the sign YOUNG-GUY.

The same informant provided also another instance of the same sentence, with slightly different features.

‘ragazzo’ ‘giornale’ ‘compra’ ‘quando’

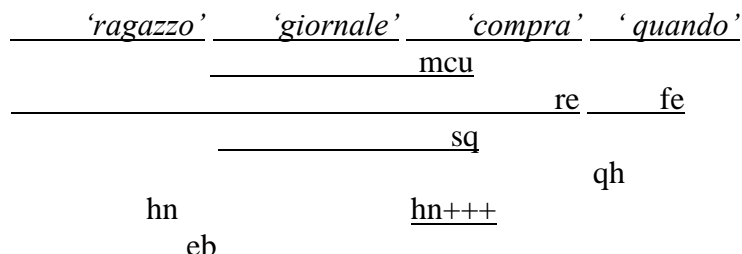
 _____ fe
 _____ eb

(P125) YOUNG-GUY NEWSPAPER BUY WHEN IX_{subject}~? 819, 652, 110, 316, 290, 277, 223, 243, 390
 ‘When does the young guy buy the newspaper?’
 [Sentence code: 03 L4a]

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, mouthing of *compra* (‘buy’) over the sign BUY, and mouthing of *quando* (‘when’) over the sign WHEN. As for non-manual markers, furrowed eyebrows occur over the entire sentence. The clause-final sign, IX_{subject}, is subject to hold

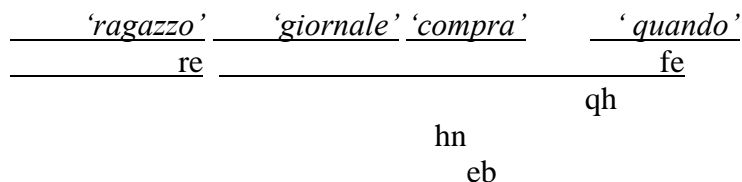
with a loosened handshape (182 ms), which leads to final lengthening. As for prosodic cues, an eyeblink occurs after the sign YOUNG-GUY, which undergoes hold (253 ms), and after which a noticeable between-signs time is measured: these data signal a clear constituent boundary and prosodic break.

3.5.2.14.3 Output L4



(P126) YOUNG-GUY NEWSPAPER BUY IX_{subject} WHEN~?
 466, 404, 615, 380, 825, 277, 186, 353, 1184
 'When does the young guy buy the newspaper?'
 [Sentence code: 02 L4]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, mouthing of *giornale* ('newspaper') over the sign NEWSPAPER, mouthing spreading of *compra* ('buy') over the signs BUY and IX_{subject}, and mouthing of *quando* ('when') over the sign WHEN. In addition, mouth corners up occur, compatibly with mouthing, over the signs NEWSPAPER and BUY. As for non-manual markers, raised eyebrows occur over the sign YOUNG-GUY, and less intensely over the signs NEWSPAPER, BUY and IX_{subject}, whereas furrowed eyebrows occur over the sign WHEN. The sign YOUNG-GUY is also marked by a single headnod and followed by an eyeblink; moreover, squinted eyes and cheeks occur over the signs NEWSPAPER and BUY, with the latter also accompanied by a repeated headnod; finally, the sign WHEN is marked by a question headshake. The clause-final sign, WHEN, is subject to hold with handshape loosening (635 ms), which leads to final lengthening. As for prosodic cues, the presence of a headnod and an eyeblink after the sign YOUNG-GUY suggest the presence of a prosodic break. Further pauses are perceivable after the sign NEWSPAPER and after the sign BUY (held for 395 ms). The manual and non-manual features of this sentence suggest the presence of a complex structure which could be rephrased into English as something similar to: 'The young-guy, (he) buys the newspaper: but when (does he)?'.



(P127) YOUNG-GUY NEWSPAPER BUY IX_{subject} WHEN~?
 363, 340, 119, 310, 206, 389, 159, 286, 719
 'When does the young guy buy the newspaper?'
 [Sentence code: 03 L4b]

The sentence is characterized by mouthing of *ragazzo* ('young guy') over the sign YOUNG-GUY, mouthing of *giornale* ('newspaper') over the sign NEWSPAPER, mouthing of *compra* ('buy') over the sign BUY, and mouthing of *quando* ('when') over the sign WHEN. As for non-manual markers, slightly raised eyebrows occur over the sign YOUNG-GUY, whereas furrowed eyebrows occur over the signs NEWSPAPER, BUY, IX_{subject}, and WHEN. Furthermore, a single headnod occurs over the

‘ragazzo’ ‘giornale’ ‘compra’ ‘quando’
 fe
 qh
 hn

(P130) YOUNG-GUY NEWSPAPER BUY IX_{object} WHEN~?

369, 395, 220, 315, 235, 129, 226, 414, 1348

‘When does the young guy buy the newspaper?’

[Sentence code: 03 L3]

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, mouthing spreading of *compra* (‘buy’) over the signs BUY and IX_{object}, and mouthing of *quando* (‘when’) over the sign WHEN. As for non-manual markers, furrowed eyebrows occur over the entire sentence. Furthermore, a single headnod occurs over IX_{object}, and a question headshake occurs over the sign WHEN. The clause-final sign, WHEN, is subject to hold (432 ms), which leads to final lengthening. Prosodic cues within the sentence are not observed; nonetheless, pauses are perceived after the sign YOUNG-GUY, the sign NEWSPAPER, and the sign IX_{object}, respectively.

‘ragazzo’ ‘giornale’ ‘compra’ ‘quando’
mcd
 re fe
 we
 hn hn eb

(P131) YOUNG-GUY NEWSPAPER BUY IX_{object} WHEN~?

198, 434, 230, 312, 228, 146, 182, 381, 621

‘When does the young guy buy the newspaper?’

[Sentence code: 03 L5]

The sentence is characterized by mouthing of *ragazzo* (‘young guy’) over the sign YOUNG-GUY, mouthing of *giornale* (‘newspaper’) over the sign NEWSPAPER, mouthing spreading of *compra* (‘buy’) over the signs BUY and IX_{object}, and mouthing of *quando* (‘when’) over the sign WHEN. In addition, mouth corners down occur over the sign YOUNG-GUY. As for non-manual markers, raised eyebrows occur over the signs YOUNG-GUY, NEWSPAPER, BUY (over which furrow for a brief moment), and IX_{object}, whereas furrowed eyebrows occur over the sign WHEN. Furthermore, wide eyes occur over the signs BUY and IX_{object}. Moreover, a single headnod occurs over the signs NEWSPAPER and BUY, respectively. The clause-final sign, WHEN, is subject to hold (265 ms), which leads to final lengthening. As for prosodic cues, an eyeblink occurs after the sign IX_{object}, whereas pauses within the sentence are not observed.

3.5.2.14.5 Informants’ insights on Context L sentences

Informant 01, in relation to sentence L5, stated that the context given is not appropriate, since the mention of a specific newspaper is needed for sentence L5 to be acceptable. Informant 02, in relation to sentence L2, expressed it being not spontaneous advancing several hypotheses: signing economy, which would prevent redundancy, useless repetitions; articulatory difficulties, which would disfavor a third-person and not disfavor a second-person (see § 3.5.3, Further data collected); on the other hand, its usage would be justified if the clause-final IX_{subject} was a deictic pointing to the referent, present in the real context of utterance. Similarly, the same informant, suggested that L3 could be possibly acceptable if the referent (i.e., the newspaper) was present in the real context, as a deictic

gesture equal to gestures accompanying the spoken language. Informant 03, in relation to sentence L3, expressed a judgement of strong ungrammaticality (notice that for this signer, the post-wh IX_{subject} is allowed, whereas the post-wh IX_{object} is completely ruled out). Informant 04, in relation to sentence L5, stated that the sentence is grammatical *per se*: however, the context given, which is centered on the subject, is not appropriate for the sentence, focused on the object.

3.5.2.14.6 Comment on Context L output sentences

Content interrogative sentences (transitive verb, NP subject, NP object) with a post-wh clause-final indexical sign (either IX_{subject} or IX_{object}) displayed a noticeable degree of ungrammaticality, since the one with a clause-final IX_{subject} was produced by one informant only, and the one with a clause-final IX_{object} was not produced by any informant. This piece of data cannot be taken as a definitive proof for the ungrammaticality of a post-wh clause-final indexical sign in light of the possibility, described in § 3.5.3 (Further data collected), of a post-wh clause-final IX_{subject} in the second-person singular. Therefore, further research is needed to verify the asymmetry between the grammaticality of a post-wh IX_{subject} versus a post-wh IX_{object}; possible restrictions acting at the person level (for instance, the second-person allows for a post-wh clause-final IX_{subject}, whereas a third-person – tendentially – disallows it, and the reasons underlying this); contextual reasons. With data available it can be stated that a post-wh clause-final indexical sign is generally not accepted, especially if it is an indexical sign co-referent with the object.

On the other hand, a pre-wh indexical sign (either IX_{subject} or IX_{object}) is slightly more accepted, since the sentence with a pre-wh IX_{subject} was produced by three informants, and the one with a pre-wh IX_{object} was produced by two informants. The fact that these sentences were not produced by all informants, however, should suggest a degree of either ungrammaticality at the syntactic level, or a degree of unacceptability for contextual reasons.

The collected sentences differ as for non-manual markers, prosodic cues and pauses to the point that a comparison becomes somewhat complicated. In particular, some informants seem to not have used a matrix clause, but a more complex structure made of more than one single clause.

In Table III.19, in the following page, mean signs duration and mean between-signs time (indicated as 'time') in output sentences L1, L2, L4, L5 is shown, for the sake of completeness.

	L1 ⁷⁶	L2	L4	L5 ⁷⁷
YOUNG-GUY	342 ms	522 ms	317 ms	283 ms
<i>time</i>	305 ms	532 ms	320 ms	414 ms
NEWSPAPER	238 ms	133 ms	277 ms	225 ms
<i>time</i>	287 ms	315 ms	299 ms	313 ms
BUY	339 ms	256 ms	395 ms	231 ms
<i>time</i>	-	-	269 ms	137 ms
IX _{subject}	-	-	155 ms	-
IX _{object}	-	-	-	204 ms
<i>time</i>	249 ms	229 ms	263 ms	397 ms
WHEN	1014 ms	266 ms	894 ms	984 ms
<i>time</i>	-	248 ms	-	-
IX _{subject}	-	517 ms	-	-

Table III.19 – Mean signs duration and mean between-signs time in output sentences L1-L2-L4-L5.

3.5.2.15 Intermediate summary: content interrogative clauses (with intransitive and transitive verbs)

Content interrogative clauses with an intransitive verb articulated in the neutral space (TO WORK) were tested with a pronominal subject (third person plural). In particular the following were tested for: a sentence with a pre-verbal pronominal plural subject (C1); a sentence with a pre-verbal pronominal subject and a post-wh, clause-final indexical sign co-referent with the subject, specified for number features (C2); a sentence with a post-wh, clause-final indexical sign co-referent with the subject, specified for number features, only (C3); a sentence with a pre-verbal pronominal plural subject and a pre-wh indexical sign co-referent with the subject, specified for number features (C4); a sentence with a pre-wh indexical sign co-referent with the subject, specified for number features, only (C5).

Content interrogative clauses with a transitive verb articulated in the neutral space (TO BUY) were tested in the only condition of arguments overtly expressed with full noun phrases (i.e., NP subject, NP object), with both referents singular in number. In particular, the following were tested: a sentence without any clause-final indexical sign (L1); a sentence with a post-wh, clause-final indexical sign co-referent with the subject (L2); a sentence with a post-wh, clause-final indexical sign co-referent with the object (L3); a sentence with a post-verbal, pre-wh indexical sign co-referent with the subject (L4); a sentence with a post-verbal, pre-wh indexical sign co-referent with the object (L5).

In content interrogative clauses, with either an intransitive verb or a transitive verb, a post-wh indexical sign, either co-referent with the subject or with the object depending on the possibilities given by the verbal argument structure, is rarely allowed for. On the other hand, a higher degree of acceptability was seen for pre-wh indexical signs, as can be seen from the table below.

⁷⁶ In L1, sentence (P122) was not included because of the presence of the sign IX_K, which naturally interferes with the timings.

⁷⁷ In L5, sentence (P129) was not included since the structure was later deemed ungrammatical by the same informant.

Context C	Number of produced sentences	Context L	Number of produced sentences
C1	4	L1	4
C2	1	L2	1
C3	1	L3	0
C4	2	L4	3
C5	3	L5	2

Table III.20 – Number of produced sentences shown for context given.

Informants' insights suggest that context plays an important role for the licensing of an indexical sign. In particular, as for content interrogative sentences with a transitive verb, some informants stated that, in order to have an IX_{object} , the context should be centered on that referent, otherwise the sentence would not be acceptable.

Further research is needed to confirm the grammaticality asymmetry noticed for a post-wh, clause-final IX_{subject} versus a post-wh, clause-final, IX_{object} , and to investigate the reasons underlying the phenomenon. In addition to that, the person feature of the pronominal element should also be tested for: as can be seen below (§ 3.5.3, Further data collected), some informants allow for a post-wh, clause-final indexical sign co-referent with a second-person singular subject, while disallowing it for a third-person singular or plural subject. Collected data suggest the presence of restrictions: however, at the moment it is not possible to identify with enough accuracy the reason(s) leading to a strong dispreference or to plain ungrammaticality, due to both variability and scarcity of data.

3.5.2.16 Intermediate summary: sentence repetition task

Sentence repetition task included declarative clauses, polar interrogative clauses, content interrogative clauses, with an intransitive verb (TO WORK) and a transitive verb (TO BUY), both articulated in the neutral space.

As for declarative clauses and polar interrogative clauses, both a clause-final IX_{subject} or a clause-final IX_{object} were attested: however, while in polar interrogative clauses these indexical signs were almost equally produced, in declarative clauses the clause-final IX_{subject} was produced less frequently than the clause-final IX_{object} .

As for content interrogative clauses with an intransitive or with a transitive verb, a clause-final, post-wh indexical sign was usually not accepted – therefore not produced – whereas pre-wh indexical signs were accepted to a higher degree. As can be seen below in § 3.5.3 (Further collected data), some informants allowed for a clause-final, post-wh, indexical sign co-referent with the sentence subject when this was at the second person singular, while they disallowed for it at the third person singular: further research is needed to understand the processes underlying these apparent restrictions.

As for its pragmatic function, informants provided spontaneous feedback during the sentence repetition task, substantially aligned with what stated during the grammaticality judgement task. First, the clause-final indexical sign is perceived as specifying the entity it refers to. In addition, context seems to play an important role for the grammaticality of a clause-final indexical sign: the entity to which the clause-final indexical sign refers to has to be previously introduced or mentioned in the discourse, which should be centered on the same entity in order for that to be highlighted and specified.

3.5.3 Data – Further collected data

During the sentence repetition task, informants spontaneously produced further sentences, for instance to better explain a specific context of usage of a structure; in other cases, they were directly asked to judge the grammaticality of sentences minimally different from the input sentence given⁷⁸ and to produce the sentence if it was considered grammatical. In this section, data thus collected are described. Sentences are reported in glosses provided with main non-manual markers and a translation in English, followed by a description which includes any further relevant feature and context insight. Sentences are given the code E (‘extras’) followed by a progressive number – in order to be easily recalled in the following discussion.

3.5.3.1 Post-adverbial clause-final indexical sign

- (E1) IX₁ LIKE LITTLE IX₁.
 ‘poco’
 ‘I don’t like that a lot.’

This sentence was spontaneously produced while commenting on the grammaticality of another sentence. As can be seen in the glosses, the clause-final indexical sign co-referent with the first-person singular subject occurs in a post-adverbial position, without any intonational break. In addition, final lengthening does not apply to the clause-final indexical sign. Finally, mouthing spreading of *poco* (‘little’) over the clause-final indexical sign can be observed.

3.5.3.2 Clause-final indexical sign in declarative clause (‘accuse’ meaning)

- (E2) PLATE EAT ALL. IX₂ EAT DONE IX₂~.
 ‘mangiato’
 nmm
 ‘The plate is empty. You ate it all, didn’t you?’

- (E3) MOM DISCOVER VASE BREAK. IX₂ TOUCH DONE IX₂~.
 ‘toccato’
 nmm
 ‘Mom found out that the vase is broken. It was you, wasn’t it you?’

These sentences were spontaneously produced while providing a possible context in which a clause-final indexical sign would be used naturally in a declarative clause. As can be seen in the glosses, the clause-final indexical sign, co-referent with the second-person singular subject, occurs after the aspectual marker DONE, and without any intonational break. Mouthing spreading of *mangiato* (‘ate’) and *toccato* (‘touched’), respectively, over the aspectual marker DONE and the clause-final indexical sign can be observed. Furthermore, specific non-manual markers occur over the entire sentence: squinted eyes, tensed cheeks, right head lean, and a smirk are produced; in addition, a repeated head-nod occurs over the clause-final indexical sign, which is also subject to final lengthening. The sentence, translated into English with a question tag but not necessarily corresponding to one from a

⁷⁸ For instance, if IX_{3P} WORK IX_{3P}? was deemed ungrammatical, it was asked whether IX₂ WORK IX₂? was equally ungrammatical.

syntactic standpoint, conveys an underlying accusation, in which the signer suspects that the interlocutor was the one who did the action referred to.⁷⁹



Figure III.7 – Non-manual markers characterizing sentences (E2) and (E3):
squinted eyes, tensed cheeks, right head lean, and smirk.

3.5.3.3 Clause-final indexical sign in polar interrogative clauses with a second-person singular subject

In both the grammaticality judgement task and the sentence repetition task, sentences with a third-person singular or plural subject were in some cases deemed ungrammatical. Informants were thus asked whether the same structure could be accepted with a second-person singular subject. In other cases, while explaining the context usage, sentences with a second-person singular were spontaneously produced. In this paragraph, clause-final indexical sign in polar interrogative clauses with a second-person singular subject will be described.

Consider the following minimal pair:

(E4) $\frac{\frac{\text{'lavoro'}}{\text{re}}}{\text{WORK IX}_2?}$
'Do you work?'

(E5) $\frac{\frac{\text{'lavoro'}}{\text{fe}}}{\text{WORK IX}_2?}$
'Do you work?'

In both sentences,⁸⁰ the subject does not occur in its canonical sentence-initial pre-verbal position, but only surfaces in sentence-final post-verbal position. Furthermore, no intonational breaks between

⁷⁹ In sentences (E2)-(E3), the context is provided linguistically. Clearly, it needs not being signed if it were the actual context in which the conversation takes place.

⁸⁰ According to previous literature (Calderone, in Branchini and Mantovan (eds.) (2020), *Syntax: 2.6 Pronoun copying*), sentences (E4)-(E5) would be considered instances of Subject Pronoun Copy, in which the copied subject is phonologically null. In Chapter 4 an alternative proposal will be advanced.

a) Indexical sign occurring before the interrogative sign

- (E7) FOR-EXAMPLE, THREE PEOPLE FRIEND AROUND IX₁ CHAT, IX₁ [Turns towards
 $\frac{\text{'lavoro'}}{\text{wh}}$
different interlocutor within the group] – IX₂ WORK IX₂ WHEN?
‘[I would use this structure in the following context:] For example, there are three friends, I’m
chatting, and I go – Hey you, when do you work?’

The informant who produced the sentence above explained that the first occurrence of IX₂ functions as an attention getter. No clear intonational breaks are observed, however, the time between the first IX₂ and the following sign is longer than the time between the second IX₂ and the preceding and following sign. Furthermore, the first IX₂ is articulated for a longer time than the second IX₂. As for non-manual markers, typical content interrogative non-manual markers spread over the whole sentence. Finally, mouthing spreading of *lavoro* (‘work’) from the sign WORK over the following indexical sign and over the interrogative sign WHEN is observed.

- $\frac{\text{'lavoro'} \text{'quando'}}{\text{wh}}$
(E8) WORK IX₂ WHEN?
‘When do you work?’

In the sentence above, the pronominal second-person subject does not occur in its canonical sentence-initial pre-verbal position, but it is instead found post-verbally. Mouthing spreading of *lavoro* (‘work’) from the sign WORK over the indexical sign can be observed. Content interrogative clauses non-manual markers (e.g., furrowed eyebrows) spread over the entire sentence. No intonational breaks or pauses are observed.

b) Indexical sign occurring after the interrogative sign

- $\frac{\text{'tu'} \text{'lavoro'} \text{'quando'}}{\text{wh}}$
(E9) IX₂ WORK WHEN IX₂?
‘When do you work?’

- $\frac{\text{'lavoro'} \text{'quando'}}{\text{wh}}$
(E10) WORK WHEN IX₂?
‘When do you work?’

In the first sentence, the pronominal second-person subject occurs in its argumental sentence-initial position, and it is accompanied by mouthing *tu* (‘you’). The sentence-final indexical sign co-referent with the subject occurs after the interrogative sign WHEN, without any intonational breaks or change in non-manual markers. Mouthing spreading of *quando* (‘when’) from the sign WHEN over the sentence-final indexical sign can be observed. Content interrogative clauses non-manual markers (e.g., furrowed eyebrows) spread over the entire sentence. Progressive assimilation of orientation can be observed over the clause-final indexical sign, which takes the orientation of the preceding sign, WHEN.



Figure III.9 – (Loosened) Progressive orientation assimilation. IX_2 , originally produced with the palm facing downward (left), is later produced with the palm facing upward (right), as a result of progressive orientation assimilation from the preceding sign, WHEN, which features an upward palm orientation (center).

In the second sentence, only the sentence-final indexical sign co-referent with the subject is present, and it occurs after the interrogative sign WHEN, without any intonational breaks or change in non-manual markers. Mouthing spreading of *quando* (‘when’) from the sign WHEN over the sentence-final indexical sign can be observed. Content interrogative clauses non-manual markers (e.g., furrowed eyebrows) spread over the entire sentence.

Another informant produced a sentence similar to (E9), in which progressive assimilation of orientation can be observed over the clause-final indexical sign, which takes the orientation of the preceding sign, WHEN, illustrated in the image below. Furthermore, the clause-final indexical sign is subject to final lengthening.



Figure III.10 – (Total) Progressive orientation assimilation. IX_2 , originally produced with the palm facing sideward (left), is later produced with the palm facing upward (right), as a result of progressive orientation assimilation from the preceding sign, WHEN, which features an upward palm orientation (center).

The possibility of a post-wh clause-final indexical sign co-referent with the subject is not restricted to sentences with intransitive verbs.

- ‘tu’ ‘giornale’ ‘compra’ ‘quando’
wh
 (E11) IX_2 NEWSPAPER BUY WHEN $IX_2 \sim ?$
 ‘When do you buy the newspaper?’

In the sentence above, the pronominal second-person subject occurs in its argumental sentence-initial position, and it is accompanied by mouthing *tu* ('you'). The sentence-final indexical sign co-referent with the subject occurs after the interrogative sign WHEN, without any intonational breaks or change in non-manual markers. Mouthing spreading of *quando* ('when') from the sign WHEN over the sentence-final indexical sign can be observed. Content interrogative clauses non-manual markers (e.g., furrowed eyebrows) spread over the entire sentence, intensifying towards the end of the sentence. Total progressive assimilation of orientation over the clause-final indexical sign, which takes the orientation of the preceding sign, WHEN, can be observed. In addition, the clause-final indexical sign is subject to final lengthening.

3.5.3.5 Clause-final indexical sign in double-wh content interrogatives with a second-person singular subject

The following sentence, signed by one of the informants participating to this study, was collected by chance in a setting in which the informant was conversing with another deaf native signer.⁸¹

_____ *'comporta'* _____ *'come'*
_____ wh
 eb
 (E12) [...] IX₂ BEHAVE HOW IX₂ Q_{artichoke}?
 ' [...] How would you behave?'

First of all, the whole sentence is produced in about 1.200 ms. As for manual features, the verb BEHAVE displays repetition loss, while the interrogative sign HOW displays repetition loss and weak hand drop.⁸² As for non-manual features, the first indexical sign is not accompanied by mouthing, whereas mouthing spreading of *comporta* ('behave', a truncated form) spreads over HOW and the following indexical sign; furthermore, the final interrogative element, Q_{artichoke}, is accompanied by *come* ('how') mouthing. Content interrogative non-manual markers (e.g., furrowed eyebrows) spread over the entire sentence. As for prosodic cues, no intonational breaks, pauses or eyeblinks are observed.

3.5.3.6 Intermediate summary: further collected data

Besides data collected through the grammaticality judgement task and the sentence repetition task, further data were collected, as spontaneous productions or answers to impromptu questions. Some interesting remarks can be made.

As for the phonological characteristics of the clause-final indexical sign, it was seen that it can be subject to progressive orientation assimilation, i.e., for reasons of ease of articulation, the indexical sign takes the orientation of the sign preceding it (e.g., the orientation of the sign WHEN).

As for the indexical sign position, while most of the sentences tested and collected had the indexical sign in a post-verbal position – which may lead to argue for a cliticization of the indexical onto the verb – it was seen that the indexical sign can appear after the aspectual marker DONE, as well as post-adverbially and post-wh. Nonetheless, at the moment it is not possible to state with enough certainty if there are restrictions on the kind of adverbials that allow for a post-adverbial indexical

⁸¹ The informant was asked and gave permission to use the sentence for this study.

⁸² The HOW variant used is the one with the 5 handshape, usually articulated symmetrically with both articulators.

sign, and on the kind of interrogative signs that allow for a post-wh indexical sign, not to mention possible restrictions over the person expressed by the indexical sign itself.

As for the pragmatic function of declarative clauses with a clause-final indexical sign co-referent with the subject, an interesting piece of data was collected: with an appropriate context, and with specific non-manual markers (namely, squinted eyes, tensed cheeks, lateral head lean, and smirk), the sentence assumes, so to say, an accusation meaning, through which the signer expresses their suspects over the fact that the interlocutor is the one who did the action described in the sentence. Furthermore, the clause-final indexical sign co-referent with the subject can occur also in polar interrogative clauses marked by furrowed eyebrows, which are used to express disbelief.

3.6 – Summary

In this chapter, a description of a preliminary study on indexical signs in clause-final position in Italian Sign Language (LIS) was provided. The study consisted in a grammaticality judgement task and a sentence repetition task aimed at first verifying the grammaticality, then understand the characteristics of clause-final indexical signs co-referent either with the sentence subject (for sentences with an intransitive or a transitive verb) or with the sentence object (for sentences with a transitive verb), in declarative clauses, polar interrogative clauses, content interrogative clauses.

Clause-final indexical signs can occur in declarative clauses and polar interrogative clauses, with either an intransitive or a transitive verb, and can refer to either the sentence subject or the sentence object (accordingly to the possibilities provided by the verb argument structure), regardless of the type of overt realization of the arguments (i.e., NP or pronominal form). Clause-final indexical signs can also occur in content interrogative clauses, with either an intransitive or a transitive verb, but can refer to the sentence subject only.⁸³ In addition, clause-final indexical signs were not equally considered grammatical or equally produced among sentence types, or in relation to the entity to which the clause-final indexical sign is referred to.

In sentences with an intransitive verb, for instance, which featured a clause-final indexical sign co-referent with the subject (expressed pronominally in sentence-initial position, as in A2/B2, or dropped, as in A3/B3), the overall grammaticality was higher in polar interrogative clauses than in declarative clauses. In content interrogative clauses with an intransitive verb, on the other hand, the clause-final indexical sign co-referent with the subject (expressed pronominally in sentence-initial position, as in C2, or dropped, as in C3), was accepted marginally, especially if compared with a standard structure (as in C1) or a structure featuring a pre-wh indexical sign co-referent with the subject (not overtly expressed elsewhere in the sentence, as in C5). Although data are not clear-cut, a tendency towards an asymmetry between declarative clauses and polar interrogative clauses can be observed, with the former disfavoring the presence of a clause-final indexical sign co-referent with the subject, and the latter favoring – or at least more widely allowing for – it. In sentences with a transitive verb, instead, not only can be seen the same tendency between declarative clauses and polar interrogative clauses, but also one towards an asymmetry between a clause-final IX_{subject} and a clause-final IX_{object}, with the latter – provided an appropriate context – more frequently allowed for than the former. On the other hand, in content interrogative clauses, a post-wh, clause-final IX_{object} seems to be disallowed, whereas a post-wh, clause-final IX_{subject} seems to be marginally allowed, with possibly restrictions acting upon its licensing.

⁸³ The content interrogative clauses included in the tasks as input sentences only featured arguments overtly realized as NPs.

As for the indexical sign positioning within the sentence, the following can be stated. In both the grammaticality task and the sentence repetition task, most input sentences featured the clause-final indexical sign in a post-verbal position, few featured the clause-final indexical sign in a post-wh position, whereas other positionings (e.g., post-aspectual, post-adverbial, post-negation) were not tested for. Nonetheless, amongst collected sentences, examples of post-aspectual and post-adverbial clause-final indexical signs co-referent with the sentence subject were collected. However, during the tasks, some sentences featuring a clause-final, post-wh indexical sign were considered ungrammatical, in particular the ones featuring a IX_{object} . Therefore, it appears, from these preliminary data, that some restrictions may apply as for the positioning of a clause-final indexical sign: even so, at the moment definitive conclusions cannot be drawn, due to the paucity of data. Further research is needed on post-adverbial, post-negation, post-wh indexical signs, the type of interrogative sign used, and the context of usage.

As for articulation times, a remarkable degree of variability was observed, with a minimum of about 100 ms to a maximum of over 1000 ms (hold included), for both IX_{subject} and IX_{object} , partly – and reasonably so – due to individual signing style differences. While a mean value of 420 ms (hold excluded) was observed for clause-final IX_{subject} s in declarative clauses and in polar interrogative clauses with an intransitive verb, a mean value of about 220 ms (hold excluded) was observed for clause-final indexical signs (either IX_{subject} or IX_{object}) in declarative clauses and in polar interrogative clauses with a transitive verb. A further comparison of mean articulation times (hold excluded) of IX_{subject} and IX_{object} in declarative clauses and in polar interrogative clauses with a transitive verb, carried for each informant, shows that even the larger difference in mean durations between IX_{subject} and IX_{object} lies below 100 ms. In addition to that, no clear-cut tendencies were observed, since at times a longer articulation time was observed for IX_{subject} , at others for IX_{object} , and at others the values were comparable.

As for phonological features, the indexical sign is produced as a pointing sign with G handshape. In this study, it was not verified whether other handshapes are allowed.⁸⁴ The indexical sign can undergo progressive orientation assimilation, which is a phonological phenomenon in which a sign takes the orientation of the preceding sign (e.g., in the string ‘[...] WHEN IX_2 ?’), the indexical sign IX_2 , whose palm orientation is sideward, may take an upward palm orientation as a progressive assimilation from the preceding sign WHEN). The indexical sign was not found to be characterized by its own mouthing or mouth gesture:⁸⁵ conversely, it was steadily observed mouthing spreading from the preceding sign(s). The indexical sign could display hold (from about 120 ms to over 1000 ms), which led to final lengthening. Interestingly, hold on the clause-final indexical sign was present in about half of the declarative clauses, and in almost all of the polar interrogative clauses analyzed, regardless of its syntactic role.

As for morphological features, the indexical sign must agree spatially with the point of the signing space (previously) associated with the entity it refers to. In addition, it must be specified for number features: for instance, if the sentence subject is plural, the clause-final indexical sign co-referent with the subject must be specified for number, otherwise the sentence would result ungrammatical.⁸⁶

As for non-manual markers, in declarative clauses it was observed that the clause-final indexical sign is often marked by means of a single headnod, or a repeated headnod usually starting on the preceding

⁸⁴ B-bent handshape is attested in LIS for clause-final indexical signs. The reader is referred to Chapter 4 § 4.1.1, example (1) for an interpretation of the specific case reported.

⁸⁵ Further research is needed as for the usage of specific contexts that might trigger mouthing or mouth gestures on the clause-final indexical sign.

⁸⁶ Number agreement was tested with subjects only, in declarative clauses and polar interrogative clauses with an intransitive verb.

sign. On the other hand, in polar interrogative clauses and in content interrogative clauses, specific non-manual markers over the clause-final indexical sign were not observed.

As for prosody, the clause-final indexical sign is usually not preceded by pauses or prosodic cues such as eyeblinks.

As for its pragmatic function, significant feedback from the informants suggests that the clause-final indexical sign function is that of stressing, emphasizing, highlighting, underlining, specifying the entity to which it refers to, for any structure type investigated. For this reason, context acquires an important role in allowing the presence of the indexical sign and in making it (un)grammatical: in order to be specified or emphasized, the entity to which the clause-final indexical sign refers to needs to be introduced or mentioned previously in the discourse. In fact, if the 'center of the discourse' is on a given referent, if a following clause is centered on another, unmentioned referent, the result is that of ungrammaticality (at the discourse level, since most structures were still grammatical *per se* and with appropriate contexts). In addition, further pragmatic functions were found: declarative clauses marked with squinted eyes, tensed cheeks, lateral head lean, and smirk, acquire an accusation meaning; polar interrogative clauses marked with furrowed eyebrows express surprise, astonishment, disbelief, or a confirmation request. Nonetheless, for polar interrogative clauses these specific pragmatic functions may be related more to the particular sentence type, characterized by the mentioned main non-manual marker, than to the presence of the clause-final indexical sign. Only in declarative clauses with an accusation meaning there might be a stronger tie between the presence of the clause-final indexical sign, which is probably mandatory for such a structure, and its pragmatic function.

The following chapter is devoted to the discussion of data collected in this study.

Chapter 4

Discussion

In this chapter, findings over clause-final indexical signs as observed in this study will be described and discussed in a comparison with previous accounts of clause-final indexical signs in LIS and in a selection of other sign languages. Phonological features (§ 4.1), morphological features (§ 4.2), prosodic features (§ 4.3), syntactic features (§ 4.4), and pragmatic features (§ 4.5) will be addressed. A summary (§ 4.6) will close the chapter.

4.1 Phonological features

In this paragraph, manual features (§ 4.1.1) and non-manual features (§ 4.1.2) of clause-final indexical signs, as well as observed phonological phenomena affecting them (§ 4.1.3) and phonological limitations in the usage of a clause-final indexical sign (§ 4.1.4) will be addressed.

4.1.1 Manual features

The clause-final indexical sign is produced as a pointing sign with a G handshape, which is the typical handshape used in LIS for determiners, personal pronouns, possessive pronouns, possessive adjectives, locatives, and temporal adverbials (see Chapter 1 § 1.2.1 for a description). It was beyond the scope of the present study to verify whether other handshapes could be acceptable, as in the case of TİD (Özsoy, 2020, here reported in Chapter 2 § 2.1),¹ in which the clause-final pronoun can be either homophonous with the personal pronoun, displaying a G handshape, or non-homophonous, displaying a B handshape.² In LIS, instances of a clause-final indexical sign with a B handshape are reported in literature, as in (1) below, in which both IX₁ are produced with B handshape and are therefore still homophonous between them: however, I would consider them to be the result of phonological phenomena originated by needs for ease of articulation, as already reported possibly being a case for functional signs, among which weak pointing signs, in cliticised forms (Mantovan, 2020).³ Nonetheless, further research is needed to clarify this issue, i.e., whether other handshapes could be used and whether they entail different meanings.⁴

¹ Özsoy, in Keleşir (ed.) (2020), Syntax: 2.2.1.3 Strategies of pronoun copying for subject and object.

² G handshape and B handshape according to LIS coding of handshapes. In TİD terminology, 1-Handshape and Flat-Handshape, respectively.

³ Mantovan, in Branchini and Mantovan (eds.) (2020), Phonology: 2.2.1 Prosodic word.

⁴ In my personal opinion, it would be actually no surprise if clause-final indexical signs with a B handshape were found, given the fact that this handshape is used as an alternative to G handshape – either as a regional variant, a personal preference, or as a sign conveying slightly different nuances of meaning – in possessive adjectives and possessive pronouns. Furthermore, LIS appears to have honorific pronouns, articulated as an unspread 5 handshape instead of a regular G handshape (Mantovan, in Branchini e Mantovan (eds.) (2020), Lexicon: 3.7.2.6 Honorific pronouns), which should, deductively, be grammatical also in a clause-final position (for instance, in polar interrogative clauses). Still, the question remains whether in the same sentence the two pronominal instances can display different handshapes or not.

- ‘comprato cosa’
wh
- (1) IX₃ ₃ASK₁ BUY IX₁ WHAT IX₁.
‘He asked me what I bought.’

(Cecchetto (2020), Syntax: 1.2.3 Content interrogatives)⁵

In our data, the clause-final indexical sign is only found to display a single, non-repeated path or arc movement (accordingly to its being singular or plural), differently from what described in Bertone (2011: 129). In fact, she also reported instances of a clause-final indexical sign featuring a repeated path movement, interpreted as a strong pronoun marking contrastive focus.⁶ Nonetheless, these data do not contrast with each other, since we did not elicitate data specifically looking for contrastive focus. The piece of data accounted for in Bertone (2011) may therefore either be expression of a different phenomenon, or of meanings and pragmatic functions not elicited in this study.⁷

4.1.2 Non-manual features

As for non-manual markers, in declarative clauses, the clause-final indexical sign was observed to be often marked by means of a single headnod, or a repeated headnod usually starting on the preceding sign, whereas in polar interrogative clauses and in content interrogative clauses, non-manual markers specifically marking the clause-final indexical sign were not observed. On the other hand, any other non-manual marker occurring over the preceding sign(s), such as raised eyebrows, furrowed eyebrows, widened eyes, mouth corners down, accordingly to the sentence type, also usually spread over the clause-final indexical sign.

In addition, the clause-final indexical sign was not found to display its own mouthing or mouth gesture: on the contrary, mouthing spreading from the previous sign(s) was steadily observed, in line with previous accounts on clause-final indexical signs in LIS (Bertone, 2011; Branchini and Mantovan (eds.), 2020).⁸ Nonetheless, as seen previously in Chapter 2, in some cases the clause-final indexical sign is reported to display shows its own mouthing:⁹ again, we would ascribe this phenomenon to specific pragmatic needs. For instance, in the example below, the signer is not actually asking a genuine question, but rather expressing their surprise for the fact that the interlocutor desires pizza.

- ‘tu pizza vuoi tu’
fe
polar int.
- (2) IX₂ PIZZA WANT IX₂?
‘Do you want pizza?’

(Cecchetto (2020), Syntax: 1.2.1 Polar interrogatives)¹⁰

⁵ This sentence previously appeared as (10) in Chapter 1 and as (30) in Chapter 2.

⁶ For more details, see § 2.2 in Chapter 2.

⁷ In other terms, different pragmatic functions may require different phonological features on the clause-final indexical sign.

⁸ For further details, see Chapter 2.

⁹ See examples (21) and (36) in Chapter 2.

¹⁰ This sentence previously appeared as (21) in Chapter 2.

4.1.3 Phonological phenomena

The clause-final indexical sign can be articulated with a hold of variable duration, which leads to final lengthening, a phenomenon attested in LIS at the right edge of phonological phrases and intonational phrases (Mantovan, 2020).¹¹ This finding is very well expected, since the indexical sign is in a clause-final position, and, consequently, at the right edge of both a phonological phrase and an intonational phrase.

In relation to hold, in our data it is also particularly worth mentioning that among the sentences featuring an intransitive verb and a clause-final indexical sign, hold occurred in 3 out of 6 declarative sentences, and in all polar interrogative sentences (6 out of 6). Similarly, among the sentences featuring a transitive verb and a clause-final indexical sign, hold occurred in 10 out of 19 declarative sentences, and in all polar interrogative sentences (30 out of 30).

Furthermore, the clause-final indexical sign can undergo partial or total progressive orientation assimilation, a phonological phenomenon in which a sign partially or totally takes the orientation of the preceding sign, as reported in sentences (3)-(4)¹² below, in which the clause-final indexical sign took the orientation of the sign WHEN.

- (3) $\frac{\text{'tu' 'lavoro' 'quando'}}{\text{wh}}$
IX₂ WORK WHEN IX₂?
'When do you work?'

- (4) $\frac{\text{'tu' 'giornale' 'compra' 'quando'}}{\text{wh}}$
IX₂ NEWSPAPER BUY WHEN IX₂?
'When do you buy the newspaper?'

4.1.4 Phonological limitations in the usage of a clause-final indexical sign

The clause-final indexical sign may be subject to articulatory constraints that result in it being less naturally or less frequently used with a third person (singular or plural), due to movements interesting elbow and wrist.¹³ Indeed, an articulatory uneasiness was at times drawn attention to by our informants. However, this was not specifically investigated in this study, and thus needs further research.

¹¹ Mantovan, in Branchini and Mantovan (eds.) (2020), Phonology: 2.2.2. Phonological phrase and 2.2.3 Intonational phrase.

¹² Respectively, (E9) and (E11) in Chapter 3.

¹³ I would suggest that an articulatory constraint might prevent the clause-final indexical sign from being produced, unless its presence is necessary, for reasons of ease of movement and signing economy. It is reasonable to think that a forward path movement, such as the one needed for a second singular person, is easier and more comfortable to articulate than an ipsilateral outward (path or arc) movement, such as the one needed for a third (singular or plural, respectively) person.

4.2 Morphological features

In this paragraph, morphological features displayed by the clause-final indexical sign, namely spatial agreement (§ 4.2.1) and number (§ 4.2.2), as well as morphological limitations in its usage (§ 4.2.3) will be addressed.

4.2.1 Spatial agreement

The clause-final indexical sign must display spatial agreement with the point of the signing space (previously) associated with the entity it refers to, as verified in this study for declarative clauses, polar interrogative clauses, and content interrogative clauses,¹⁴ exemplified below in (5)-(6)¹⁵ for the former. This finding was very well expected, and is in line with previous literature (a.o., Bertone (2011) and Calderone, in Branchini and Mantovan (eds.) (2020) for LIS; Crasborn et al. (2009) for NGT).

'ragazzo' _____
'giornale' _____
'compra'
_____ re

_____ hn+++
eb

- (5) YOUNG-GUY NEWSPAPER BUY IX_{subject}~.
'The young guy buys the newspaper.'

'ragazzo' _____
'giornale' _____
'compra'
_____ re _ _
_____ hn+++

- (6) YOUNG-GUY NEWSPAPER BUY IX_{object}~.
'The young guy buys the newspaper.'

4.2.2 Number

The clause-final indexical sign is endowed with number features which must be overtly expressed when required, i.e., when the entity it refers to is plural, as verified in this study for declarative clauses, polar interrogative clauses, and content interrogative clauses, exemplified below in (7)-(9).¹⁶

¹⁴ As for content interrogative clauses, a post-wh, clause-final indexical sign co-referent with the sentence object was deemed as ungrammatical by all informants, whereas a post-wh, clause-final indexical sign co-referent with the subject was marginally accepted with a third person singular or plural subject, and accepted to a higher degree with a second person singular subject. This suggests the presence of restrictions – either at the phonological, morphological, and/or syntactic level – which need to be more thoroughly investigated.

¹⁵ Respectively, (P37) and (P41) in Chapter 3.

¹⁶ This condition was tested only for subjects, in sentences featuring an intransitive verb. As for content interrogative clauses with an intransitive verb, only one informant produced the target sentence. The marginal grammaticality on this sentence is yet to be fully understood: either the input sentence was not optimal as for the context provided, whence its being deemed ungrammatical, or some limitations – at the phonological, morphological, and/or syntactical level – are at play. Sentences (7)-(9) are, respectively, (P6), (P15), and (P25) in Chapter 3.

towards a longer articulation time of the clause-final IX_{subject} or, vice versa, of the clause-final IX_{object} .¹⁸

At the moment, it is not clear whether the difference in the mean articulation time between clause-final indexical signs in sentences with an intransitive verb and clause-final indexical signs in sentences with a transitive verb is accidental or not: a possibility may lie in the fact that with the intransitive verb the indexical sign was plural, and it might be reasonable to think that an arc movement needs a longer articulation time than a path movement. I would lean towards a phonological interpretation of the observed phenomenon: nonetheless, in the absence of an in-depth analysis, I would leave the question open awaiting for future answers to come.

4.4 Syntactic features

In this paragraph, the syntactic features of clause-final indexical signs in LIS will be described and discussed. In particular, the sentence types in which a clause-final indexical sign can occur (§ 4.4.1), its position in relation to other sentence elements (§ 4.4.2), and its grammaticality in relation to the type of argumental realization (§ 4.4.3) will be addressed first. Then, a discussion will follow over the clause-final indexical sign and subject pro-drop instances (§ 4.4.4), and the asymmetry found in content interrogative clauses between a clause-final indexical sign co-referred to the sentence subject and the one co-referred to the sentence object (§ 4.4.5). Finally, a proposal for the clause-final indexical sign syntactic positioning will be advanced (§ 4.4.6).

4.4.1 Sentence types

Previous literature on LIS (see Bertone, 2011; Branchini and Mantovan (eds.), 2020) reported clause-final indexical signs in declarative clauses, polar interrogative clauses, content interrogative clauses, several types of subordinate clauses, and topicalized object structures.

The present study focused on declarative clauses, polar interrogative clauses, and content interrogative clauses. As for declarative clauses and polar interrogative clauses, both a clause-final IX_{subject} or a clause-final IX_{object} are grammatical. On the other hand, as for content interrogative clauses, while a clause-final IX_{subject} is grammatical, a clause-final IX_{object} is ungrammatical.

In sentences with an intransitive verb, it was observed that a clause-final IX_{subject} was considered grammatical to a lower degree in declarative clauses than in polar interrogative clauses (respectively, 2 vs. 4 with the sentence subject pronominally expressed at the beginning of the sentence and 2 vs. 5 with a clause-initial pro-dropped subject).¹⁹ On the other hand, in sentences with a transitive verb, it was observed that a clause-final IX_{subject} was considered grammatical to a lower degree in declarative clauses than in polar interrogative clauses (respectively, 6 vs. 14); vice versa, a clause-final IX_{object} was considered grammatical to a higher degree in declarative clauses than in polar interrogative clauses (respectively, 14 vs. 8).²⁰

¹⁸ The paucity of data as regards to content interrogative clauses has led me not to include these data into analysis.

¹⁹ In this part of the grammaticality judgement task, taken by 5 informants, there was one sentence for each category: therefore, the maximum number of sentences judgeable as grammatical is 5 for each category.

²⁰ In this part of the grammaticality judgement task, taken by 5 informants, there were 4 sentences for each category: therefore, the maximum number of sentences judgeable as grammatical is 20 for each category.

As for the production of sentences featuring an intransitive verb, clause-final IX_{subject}S were produced almost equally in declarative clauses and in polar interrogative clauses (respectively, 2 vs. 2 with the sentence subject pronominally expressed at the beginning of the sentence, and 3 vs. 4 with a clause-initial pro-dropped subject).²¹ As for the production of sentences featuring a transitive verb, declarative clauses with a clause-final IX_{subject} were produced less than polar interrogative clauses with a clause-final IX_{subject} (respectively, 6 sentences and 13 sentences). On the other hand, such a difference was not observed between declarative clauses with a clause-final IX_{object} and polar interrogative clauses with a clause-final IX_{object} (respectively, 13 sentences and 14 sentences).²²

These data hint at a possible difference in the main purpose of having a clause-final indexical sign in a declarative clause or in a polar interrogative clause (see § 4.4.6), which would be related not only to pragmatic functions, but also to sentence type.

Nonetheless, since the presence of a clause-final sign does not change a declarative clause into a (polar) interrogative clause, it can be stated that the clause final indexical sign is *not* an interrogative morpheme.

4.4.2 Position in relation to other sentence elements

In this study, the indexical sign was tested: in a clause-final, post-verbal position in declarative sentences and in polar interrogative sentences; in a pre-wh position in content interrogatives; in a clause-final, post-wh position in content interrogatives. Although a fine-grained study of the clause-final indexical sign positioning in relation to other sentence elements was not specifically looked for, examples of post-aspectual and post-adverbial clause-final IX_{subject} were collected, as shown below in (10)-(11).²³

_____ *'mangiato'*
 _____ nmm

(10) PLATE EAT ALL. IX₂ EAT DONE IX₂.
 'The plate is empty. You ate it all, didn't you?'

_____ *'poco'*

(11) IX₁ LIKE LITTLE IX₁.
 'I don't like that a lot.'

It can be stated safely enough that the clause-final IX_{subject} can appear in a post-verbal, or in a post-aspectual, or in a post-adverbial position. This finding is aligned with previous literature on LIS, in which a clause-final IX_{subject} is reported in a post-verbal, post-modal, post-aspectual position, as exemplified below in (12)-(14). Nonetheless, further research is needed over clause-final IX_{object}S in a post-modal, post-aspectual, and post-adverbial position, respectively, and over different adverbials, in order to verify the possible presence of restrictions.²⁴

²¹ In this part of the production task, taken by 4 informants, there was one sentence for each category: therefore, the maximum number of producible sentences is 4 for each category.

²² In this part of the production task, taken by 4 informants, there were 4 sentences for each category: therefore, the maximum number of producible sentences is 16 for each category.

²³ Respectively, (E2) and (E1) in Chapter 3.

²⁴ Should IX_{objects} be ungrammatical in positions non-adjacent to the verb, a possibility might be that IX_{object} is a clitic pronoun (for instance, a resumptive clitic pronoun), provided that it satisfies any other requirement to be considered a clitic pronoun.

‘comprato’

hn

- (12) IX₁ NEW CAR BUY IX₁.
‘I bought a new car.’

(Calderone (2020), Pragmatics: 4.1 Focus)²⁵

- (13) IX₂ MONARCHY WANT IX₂?
‘Do you want monarchy?’

(Bertone 2011: 231)²⁶

‘fatto’

hn

- (14) GIANNI_A IX_A REPORT DONE IX_{3A}.
‘Gianni said these words, he did.’

(Calderone (2020), Syntax: Functions of pronoun copying)²⁷

Conversely, as for the post-wh position in content interrogatives, although attested, it seems that it is subject to restrictions, drawing an asymmetry between clause-final IX_{subjectS} and clause-final IX_{objectS}, with the former acceptable – although not widely so among the informants – and the latter completely ruled out.

- (15) YOUNG-GUY NEWSPAPER BUY WHEN IX_{subject}?
‘When does the young guy buy the newspaper?’

- (16) *YOUNG-GUY NEWSPAPER BUY WHEN IX_{object}?
‘When does the young guy buy the newspaper?’

Not only does this found asymmetry mark a difference between subjects and objects, but also one between sentence types: as seen, in declarative clauses and in polar interrogative clauses, either a clause-final IX_{subject}, or a clause-final IX_{object} is grammatical, whereas the latter is not in content interrogative clauses. This issue will be addressed in later in § 4.4.5 and in § 4.4.6.

Another puzzling piece of data that further draws an asymmetry between subjects and objects comes from the (in)flexible positioning of the indexical sign in a pre-wh or post-wh position. In fact, as previously seen in the literature on LIS reviewed in Chapter 2, the IX_{subject} is attested in both either a pre-wh or a post-wh position, as in the examples below.

wh

- (17) BOOK IX₂ WANT IX₂ WHICH?
‘Which book do you want, you?’

(Calderone (2020), Syntax: 2.6.1 Personal Pronoun copying)²⁸

- (18) IX₂ LIVE WHERE IX₂?
‘Where do you live?’

(Bertone 2011: 231)²⁹

²⁵ This sentence previously appeared as (15) in Chapter 2.

²⁶ This sentence previously appeared as (10) in Chapter 2.

²⁷ This sentence previously appeared as (19) in Chapter 2.

²⁸ This sentence previously appeared as (26) in Chapter 2.

²⁹ This sentence previously appeared as (11) in Chapter 2.

This possibility was encountered in our data, as well, as exemplified below.

(19a) YOUNG-GUY NEWSPAPER BUY WHEN IX_{subject}?

(19b) YOUNG-GUY NEWSPAPER BUY IX_{subject} WHEN?
'When does the young guy buy the newspaper?'

However, while it is possible to have either a pre-wh IX_{subject}, or a post-wh IX_{subject}, a post-wh positioning of the IX_{object} leads to ungrammaticality.

(19c) *YOUNG-GUY NEWSPAPER BUY WHEN IX_{object}?

(19d) YOUNG-GUY NEWSPAPER BUY IX_{object} WHEN?
'When does the young guy buy the newspaper?'

The paucity of data collected in this study on this particular sentence type suggests not to draw a definitive conclusion, awaiting for further research. However, the stark ungrammaticality of the clause-final, post-wh, IX_{object} well deserves at least an explanation attempt, which could be found below in § 4.4.6.

Whichever the restrictions may be as for clause-final indexical signs in a post-wh position in content interrogatives, both collected data and data from previous literature, allow to state that the clause-final indexical sign is *not* an inflectional bound morpheme attached to a verbal root, since non-verbal elements (such as adverbials and wh- interrogatives) can occur between the verb and the indexical sign.

4.4.3 Argumental realization and clause-final indexical sign

In this study, the grammaticality of clause-final indexical signs was tested in declarative clauses and in polar interrogative clauses with a transitive verb with all the possible combinations of overt argumental realization, namely: NP subject, NP object; NP subject, pronominal object; pronominal subject, NP object; pronominal subject, pronominal object.

In the grammaticality judgement task, in both declarative clauses and polar interrogative clauses, the type of overt realization of the arguments does not seem to exert a strong influence on the sentence grammaticality. Nonetheless, in both declarative clauses and polar interrogative clauses, the type of overt realization of objects seems to show a slight tendency: sentences with a noun phrase object and a clause-final IX_{object} were considered grammatical to a higher degree than sentences with a pronominal object and a clause-final IX_{object}, regardless of the type of overt realization of the subject.

As for production, similarly, the type of overt realization of the arguments does not seem to exert a strong influence. Nonetheless, in declarative clauses, both sentences with a clause-final IX_{subject} or a clause-final IX_{object} were produced to a lesser degree when the object was expressed pronominally, regardless of the overt realization of the subject. In addition, in polar interrogative clauses, sentences with a clause-final IX_{subject} were produced to a lesser degree when the object was expressed pronominally, regardless of the type of overt realization of the subject, whereas sentences with a clause-final IX_{object} were produced to a lesser degree when the subject was expressed with a noun phrase, regardless of the overt realization of the object.³⁰

³⁰ As a side note: in some cases informants expressed their preference in having the sign PE_{object} instead of the argumental object, or in place of the clause-final IX_{object}.

Since these tendencies are not clear-cut, probably due to the overall limited number of informants who took part to the study, as well as to the number of sentences elicited and collected, it is not possible at the moment to infer sure conclusions. However, should not they be accidental, they might reveal some information on the status of the indexical sign.

4.4.4 Subject pro-drop and clause-final indexical sign

In our data, the following were collected:

- (20a) IX_{3P} WORK.
- (20b) IX_{3P} WORK IX_{3P}.
- (20c) WORK IX_{3P}.
'They work.'

- (21a) IX_{3P} WORK?
- (21b) IX_{3P} WORK IX_{3P}?
- (21c) WORK IX_{3P}?
'Do they work?'

If for one moment one abstracts away from personal preferences, specific meanings conveyed, and particular usages, there is one theoretical question to be answered, i.e., whether in (b) there is an instance of pronoun doubling, or a spell-out of a lower trace (for instance, as if an incomplete inversion occurred); similarly, to be answered is whether in (c) there is an instance of pronoun doubling with pro-drop of the first pronoun, or an inversion. Let me start from sentences (c).

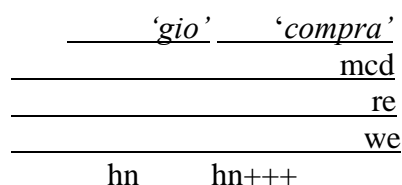
Previous literature on LIS suggested that sentences such as (c) are instances of Pronoun Copy occurring with a phonological null subject (Calderone, in Branchini and Mantovan (eds.), 2020), similarly to proposals made for other sign languages, such as ASL (a.o., Padden, 1988, 2017) and NGT (a.o., Crasborn et al., 2009).

Differently from these previous accounts, I would like to suggest that in LIS the actual phenomenon occurring is inversion.

Consider these sentences produced by the same informant, and reported in (22)-(23)³¹ below.

- | | | |
|------|--|---------------------------------------|
| | <u> 'giornale' 'compra'</u>
<u> mcd</u>
<u> re</u>
<u> we</u> | |
| (22) | IX ₃ NEWSPAPER BUY~?
'Does he buy the newspaper?' | 185, 251, 159, 207, 554 (hold 250 ms) |

³¹ Respectively, (P97) and (P98) in Chapter 3.



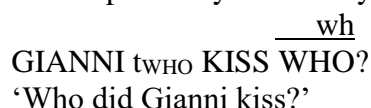
(23) NEWSPAPER BUY IX_{subject}~?
 ‘Does he buy the newspaper?’

183, 217, 251, 124, 760 (hold 571 ms)

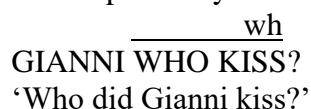
Whilst in (22) the peak of intensity of the non-manual marker raised eyebrows is reached towards the end of the sentence, in line with what reported in literature for polar interrogative clauses in LIS (a.o., see Mantovan, 2020),³² in (23) the peak of intensity of the non-manual marker raised eyebrows is reached already on the sentence first sign.

The observed different behaviour in non-manual markers reminds of an interesting study by Cecchetto, Geraci, and Zucchi (2009), focused on the strategies to mark syntactic dependencies in LIS, in which it was argued that wh- dependencies can be marked by movement, non-manual markers, or both movement and non-manual markers altogether, as illustrated in the examples below (ibidem: 296-298).

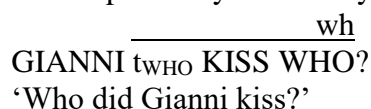
(24a) Wh- dependency marked by movement³³



(24b) Wh- dependency marked by non-manual markers³⁴



(24c) Wh- dependency marked by both movement and non-manual markers³⁵



Similarly to Cecchetto, Geraci and Zucchi’s (2009) proposal, and adopting the same syntactic structure used,³⁶ I suggest that the difference in the quality of non-manual markers between (22) and (23) is due to movement of IX_{subject} to a higher portion of the syntactic structure, most probably a projection in the Complementizer area dealing with interrogative force. In this case, non-manual markers are signaling the occurred syntactic movement. In the diagrams in the following page, (22) and (23) are shown respectively in (25a) and (25b).³⁷

³² Mantovan, in Branchini and Mantovan (eds.) (2020), Phonology: 2.3 Intonation.

³³ The NP GIANNI moves from (Spec, VP) to (Spec, IP), both specifiers posited on the left, leaving a trace in (Spec, VP). The interrogative sign WHO moves from (Compl, VP) to (Spec, CP), the specifier posited on the right, leaving a trace in (Compl, VP).

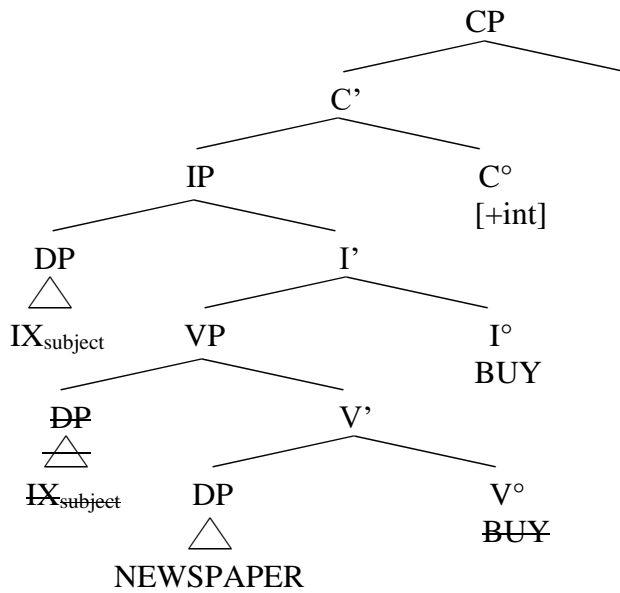
³⁴ The NP GIANNI moves from (Spec, VP) to (Spec, IP), both specifiers posited on the left, leaving a trace in (Spec, VP). The interrogative sign WHO, in (Compl, VP), checks interrogative features with (Head, CP).

³⁵ The NP GIANNI moves from (Spec, VP) to (Spec, IP), both specifiers posited on the left, leaving a trace in (Spec, VP). The interrogative sign WHO moves from (Compl, VP) to (Spec, CP), the specifier posited on the right, while its trace, in (Compl, VP) checks interrogative features with (Head, CP).

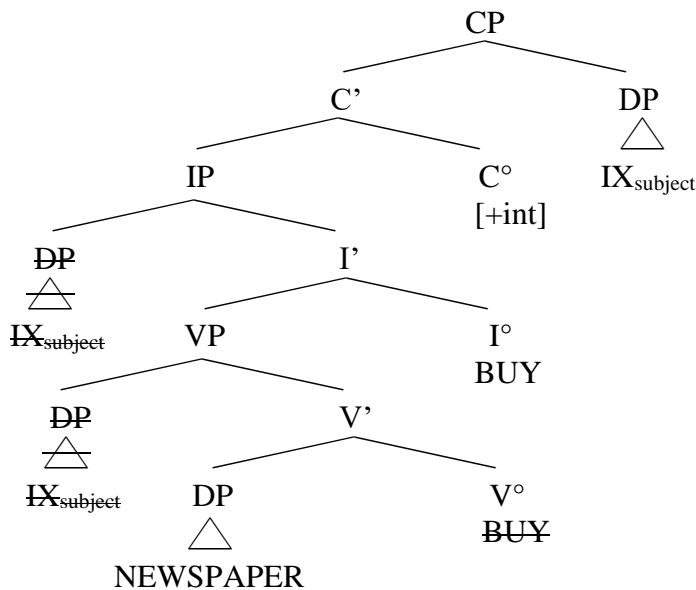
³⁶ An alternative analysis for LIS syntactic structure can be found, for instance, in Brunelli (2009).

³⁷ The diagram in (25a) does not account for the distribution of the polar interrogative non-manual markers observed. At the end of the discussion, and namely in (40), this will also be accounted for.

(25a) $\overline{\text{IX}_{\text{subject}}}$ NEWSPAPER BUY? ^{polar int.}

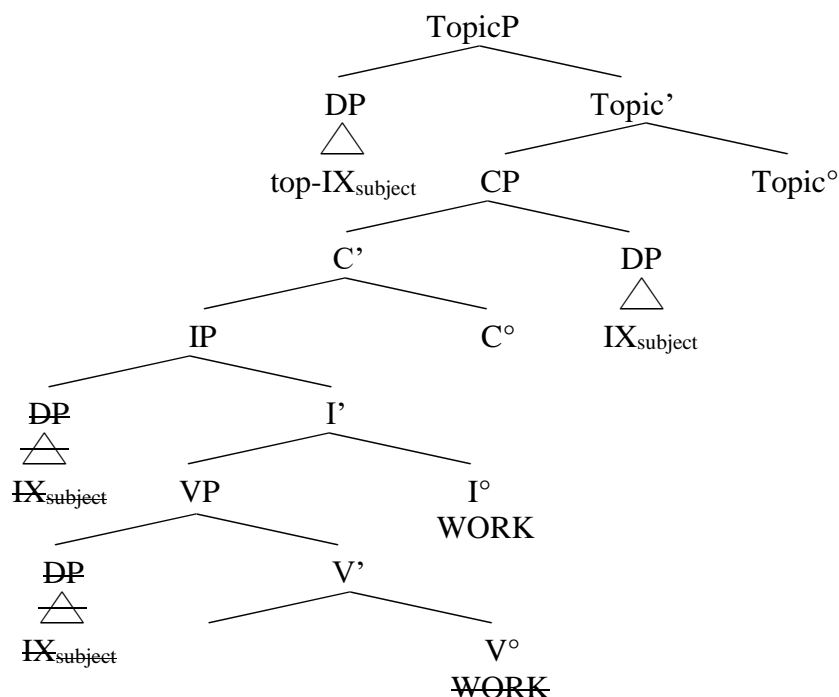


(25b) NEWSPAPER BUY IX_{subject}? ^{polar int.}

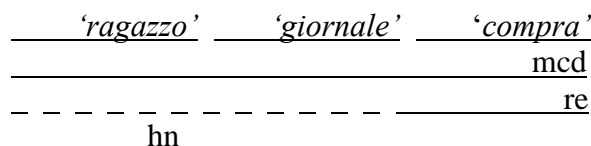


If the claim on the sentences in (c) is correct and we transfer it on the sentences in (b), there is an issue still to be solved. In fact, it does seem that the sentences in (b) contain a violation of the Theta Criterion, for which a thematic role must be assigned to one and only one argument. To solve this problem, I propose to interpret the sentences in (b) as structures constituted by a topic – base-generated in Topic Phrase – followed by the rest of the clause, in which subject inversion occurs.

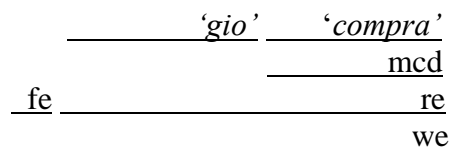
(26) topic, subject verb subject



To further support this claim, it is necessary to return to data collected in this study. If one closely looks at non-manual markers in polar interrogative clauses with a clause-final $IX_{subject}$, in most cases at least the first constituent, which so far has been referred to as the sentence subject, is either not marked by raised eyebrows – one of the most characterizing non-manual markers for polar interrogative sentences in LIS –, marked with other non-manual markers (for instance, inner brow raise or even furrowed eyebrows), or marked with less intense raised eyebrows and further non-manual markers (for instance, squinted eyes). Occasionally, prosodic cues such as eyeblink or pause are observed right after the articulation of this constituent.



(27) YOUNG-GUY NEWSPAPER BUY $IX_{subject} \sim ?$ 428, 606, 328, 443, 158, 303, 692³⁸
 ‘Does the young guy buy the newspaper?’



(28) IX_3 NEWSPAPER BUY $IX_{subject} \sim ?$ 192, 173, 129, 275, 224, 240, 459³⁹
 ‘Does he buy the newspaper?’

Therefore, while in (b) both the topic and the argumental subject are expressed, in (c) it is not the subject – supposed to be in sentence first-position – to be dropped while its doubling is expressed, but instead, it is the topic to be dropped and the argumental subject, occurring in a clause-final

³⁸ Sentence (P76) in Chapter 3.

³⁹ Sentence (P103) in Chapter 3.

position, to be expressed. Hence, the sentences in (a) would have, on the opposite side of the spectrum with respect to (c), the topic expressed and the argumental subject dropped.

The possible structure underlying sentences (a),⁴⁰ (b),⁴¹ (c) above would thus be the following:

- (29a) topic (~~subject~~) verb
 IX_{3P} WORK.
 IX_{3P} WORK?
- (29b) topic (~~subject~~) verb subject
 IX_{3P} WORK IX_{3P}.
 IX_{3P} WORK IX_{3P}?
- (29c) ~~topic~~ (~~subject~~) verb subject
 WORK IX_{3P}.
 WORK IX_{3P}?

To sum up, a change in perspective was here adopted: instead of considering the first constituent as the argumental subject and the co-referred clause-final indexical sign as a doubled pronoun, it has been proposed to take the former as a constituent base-generated in Topic Phrase, while the rest of the sentence as a clause featuring the inversion of the argumental subject, expressed pronominally.

4.4.5 Asymmetry in post-wh clause-final IX_{subject}s and clause-final IX_{object}s

In our data, the following were collected:

- (30a) YOUNG-GUY NEWSPAPER BUY WHEN IX_{subject}?
- (30b) YOUNG-GUY NEWSPAPER BUY IX_{subject} WHEN?
 ‘When does the young guy buy the newspaper?’
- (30c) *YOUNG-GUY NEWSPAPER BUY WHEN IX_{object}?
- (30d) YOUNG-GUY NEWSPAPER BUY IX_{object} WHEN?
 ‘When does the young guy buy the newspaper?’

Sentences (30a)-(30b) show that it is possible to have either a pre-wh IX_{subject}, or a post-wh IX_{subject}. However, collected sentences of the type in (30b)⁴² display a peculiar intonation, which suggests a biclausal structure, roughly translatable as: ‘The young guy buys the newspaper, but when (does he)?’. Therefore, even if at a first glance (30a) and (30b) seem to display a simple variation in linear order, they are not comparable. Sentences such as (30b) are thus excluded from the remainder of the discussion. On the other hand, sentences (30c)-(30d) show that it is possible to have a pre-wh IX_{object} but not a post-wh IX_{object}. This found asymmetry suggests that IX_{subject} and IX_{object} might occupy different positions in the syntactic structure, which will be better clarified in the proposal advanced in § 4.4.6 below.

⁴⁰ In (a), IX_{3P} may be an argumental subject, depending on the type and distribution of non-manual markers.

⁴¹ A further piece of data supporting the claim that in (b) sentences the first occurrence of IX is not the argumental subject comes from one informant’s remark over clause-initial IX₂ used, in specific contexts, as an attention getter (see (E7) in Chapter 3).

⁴² In our data, sentences (P126), (P127), (P128) in Chapter 3.

Nonetheless, although in our data a post-wh position for IX_{object} was starkly ungrammatical, such a position is not completely ruled out. The following sentences were judged by the native signer who recorded the input sentences for this study:

(31a) YOUNG-GUY BUY WHAT IX_{subject}?

(31b) YOUNG-GUY BUY WHAT IX_{object}?

‘What did the young guy buy?’

(31c) NEWSPAPER BUY WHO IX_{subject}?

(31d) NEWSPAPER BUY WHO IX_{object}?

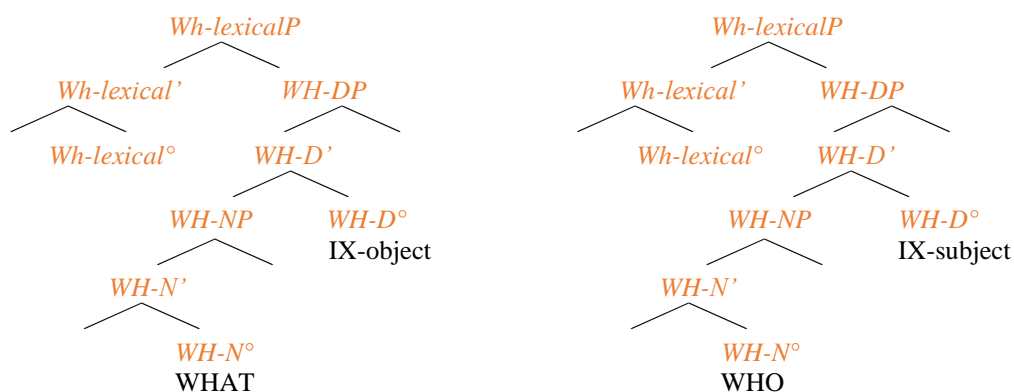
‘Who bought the newspaper?’

Sentences (31a), (31b), (31c) were considered grammatical, while sentence (31d) was considered ungrammatical. From the feedback collected,⁴³ it seems that in sentences (31b) and (31c) the indexical sign is actually part of the DP containing the wh- element, which is the reason why it is possible to find not only an IX_{subject}, but also an IX_{object} in a post-wh position. Clearly enough, this position is not the very same position of the clause-final IX_{subject} in sentence (31a).⁴⁴

At this point, the reader might have understood why sentence (31d), as well as our input sentences with the sequence WHEN IX_{object} are ungrammatical: this IX_{object} would not meet the criteria to undergo inversion, since it is not an IX_{subject}, nor the ones to be part of the DP containing the wh- element, because in (31d) the sign WHO and IX_{object} are not referred to the same entity, as well as the sign WHEN and IX_{object} in our input sentences.⁴⁵

⁴³ According to our informant, the indexical sign in (31a) functions as a reinforcer, and it is grammatical regardless of the linear distance between the sign YOUNG-GUY and the indexical sign. Sentence (31b) is grammatical: however, if the object was physically present and visible in the extralinguistic context, the sentence would be odd. Conversely, if the object is present but not recognizable, the sentence would be acceptable. Sentence (31c) is grammatical if the person is absent from the extralinguistic context: if it is present, it would be clearly odd to ask *who* and at the same time point to the person. It is nonetheless possible to produce such a sentence with the person present, if one, for instance, does not know the person’s name and is asking for that (I would translate this, meaning-wise, as “Who is that person who bought the newspaper?”).

⁴⁴ As can be inferred from the following discussion, in sentences (31b) and (31c) the indexical sign is positioned within the Wh-Lexical Phrase.



⁴⁵ Two informants marginally allowed for WHY IX_{object} (see Chapter 3 § 3.5.1.15 and § 3.5.1.16). Further research is needed on this topic.

4.4.6 A proposal for its syntactic positioning

In this study, clause-final indexical signs are interpreted to have different functions and to therefore occupy different syntactic positions, according to the sentence type (namely, declarative clause or interrogative clause), and on their being IX_{subject} or IX_{object} .⁴⁶

a) *Declarative clauses: clause-final IX_{subject}*

(32a) YOUNG-GUY NEWSPAPER BUY IX_{subject} .
'The young guy buys the newspaper.'

The proposal advanced here views the clause-final IX_{subject} as the sentence argumental subject and its positioning as the result of movement. I propose that IX_{subject} moves from (Spec, VP), where it is generated, first to (Spec, IP) – and probably other intermediate projections –, up to the specifier of a projection dealing with pragmatic functions, which could be called Pragmatic Phrase.⁴⁷ As for the first constituent, YOUNG-GUY, the proposal is that it is base-generated in Topic Phrase. As for the second constituent, NEWSPAPER, it might be either base-generated in another Topic Phrase, in which case the argumental object would be dropped, or be base-generated in (Compl, VP), thus being the argumental object (the latter case is illustrated in the diagram in the following page). The interpretation as topic or argumental object would descend from the analysis of non-manual markers and prosodic cues.⁴⁸

⁴⁶ The proposal advanced here is based on previous proposals that view LIS as a structurally head-final language (a.o., Cecchetto, Geraci, Zucchi (2006); Cecchetto, Geraci, and Zucchi (2009); Branchini and Donati (2009)). It is very well beyond the scope of this study to attempt a restructuring of LIS along the lines of Cinque's (2005) account of Greenberg's Universal 20 (1963). Future studies taking this perspective will be very welcome.

⁴⁷ The specifier of Pragmatic Phrase is assumed to be linearized to the right, as shown in the diagrams.

⁴⁸ Given these signs in this order, the following should be possible:

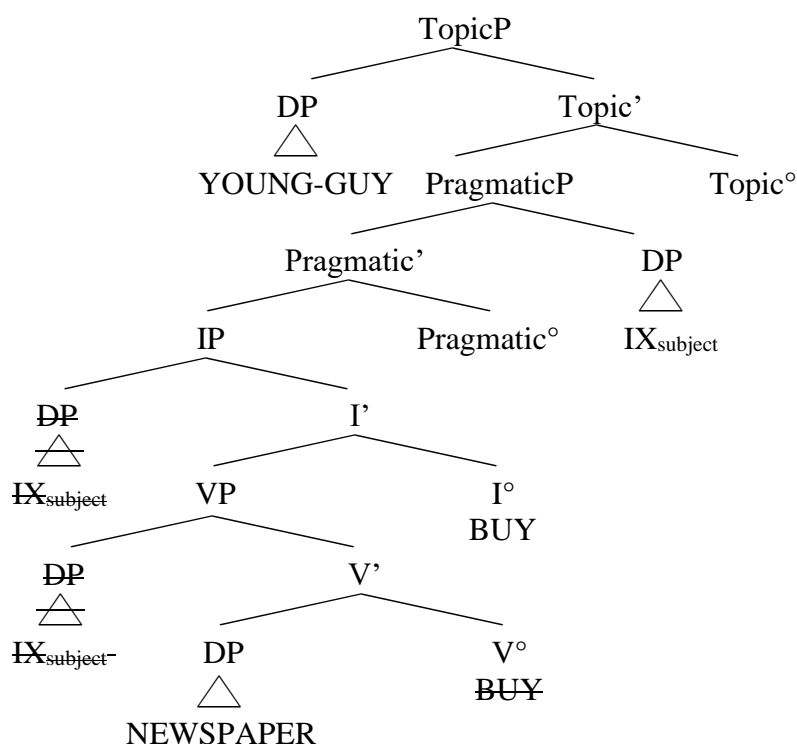
a) Topic-subject, Topic-object, ~~subject~~, (dropped object), verb, subject

YOUNG-GUY-top, NEWSPAPER-top, BUY IX_{subject} .

b) Topic-subject, ~~subject~~, object, verb, subject

YOUNG-GUY-top, NEWSPAPER BUY IX_{subject} .

(32b)



b) Declarative clauses: clause-final IX_{object}

(33a) YOUNG-GUY NEWSPAPER BUY IX_{object} .
'The young guy buys the newspaper.'

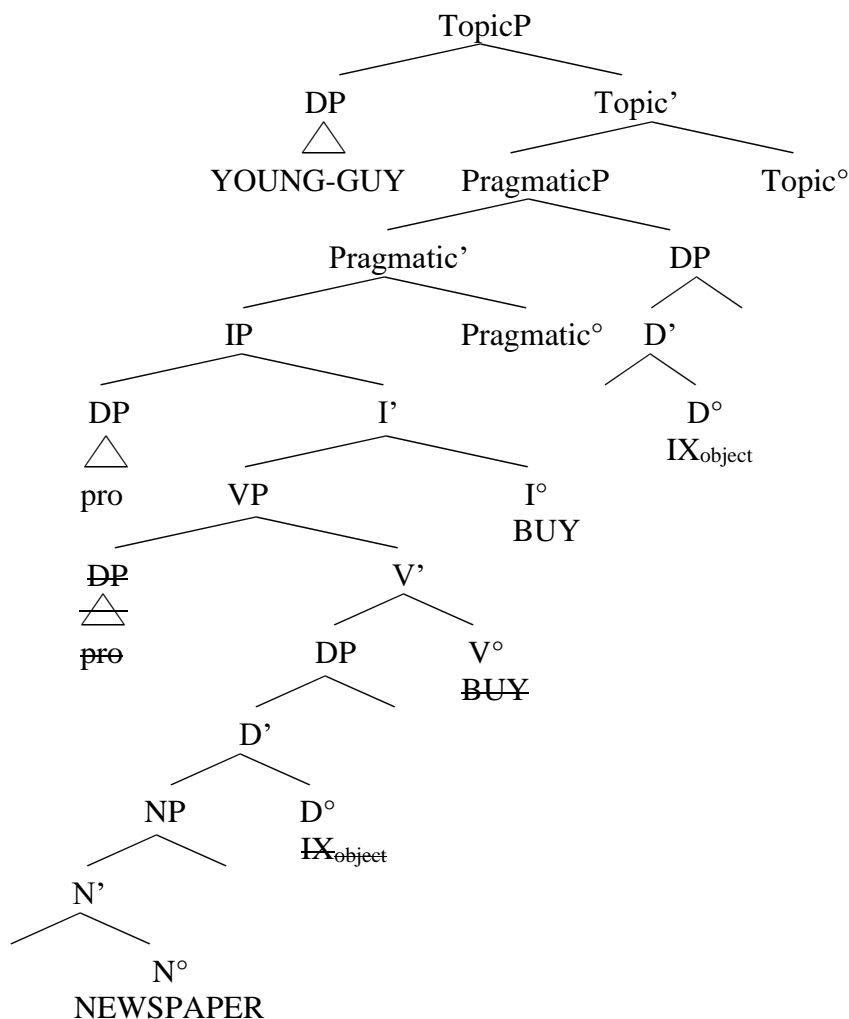
The proposal advanced here considers IX_{object} as initially part of the object DP and its positioning as the result of movement. IX_{object} would move to the specifier of a higher projection, which could be named Pragmatic Phrase,⁴⁹ in a similar fashion to what observed in content interrogative sentences featuring movement of the *wh*-element with its restrictor left in situ (e.g., IX_2 BOOK LIKE WHICH?, 'Which book do you like?', as opposed to IX_2 LIKE BOOK WHICH?).⁵⁰ As for the first constituent, YOUNG-GUY, it might be base-generated in Topic Phrase, in which case the argumental subject would be dropped (as illustrated in the diagram in the following page), or it might occupy the argumental subject position. Similarly, the NP NEWSPAPER could be base-generated in (another) Topic Phrase, or be in the argumental position (as represented in the diagram): in the first case, IX_{object} would be a (demonstrative) pronoun, whereas in the second it would be a (demonstrative) adjective.

⁴⁹ The specifier of Pragmatic Phrase is assumed to be linearized to the right, as shown in the diagrams.

⁵⁰ See, a.o., Cecchetto, in Branchini and Mantovan (eds.) (2020), Syntax: 1.2.3.6 Split between the *wh*-sign and its restriction; Cecchetto et al. (2009).

The choice of one interpretation over the other depends on the sentence characteristics as for non-manual markers and prosodic cues.^{51,52}

(33b)



⁵¹ Given these signs in this order, the following should be possible:

- a) Topic-subject, Topic-object, (dropped subject), (dropped object), verb, demonstrative pronoun IX-object
YOUNG-GUY-top, NEWSPAPER-top, BUY IX_{object}.
- b) Topic-subject, (dropped subject), argumental object, verb, demonstrative adjective IX-object
YOUNG-GUY-top, NEWSPAPER BUY IX_{object}.
- c) Argumental subject, argumental object, verb, demonstrative adjective IX-object
YOUNG-GUY NEWSPAPER BUY IX_{object}.

⁵² Future research should compare sentences with the following structures:

- a) YOUNG-GUY NEWSPAPER IX_{object} BUY.
- b) YOUNG-GUY NEWSPAPER BUY IX_{object}.
- c) YOUNG-GUY BUY NEWSPAPER IX_{object}.

These sentences – and their polar interrogative counterparts – should be analyzed as for non-manual markers, prosodic cues, and articulation times in order to shed light over the underlying syntactic structure. If all of them were grammatical, a parallel could be drawn with content interrogative clauses such as the ones described in Cecchetto, Geraci and Zucchi (2009), exemplified, respectively, as follows:

- a) IX₂ BOOK WHICH READ?
- b) IX₂ BOOK READ WHICH?
- c) IX₂ READ BOOK WHICH?

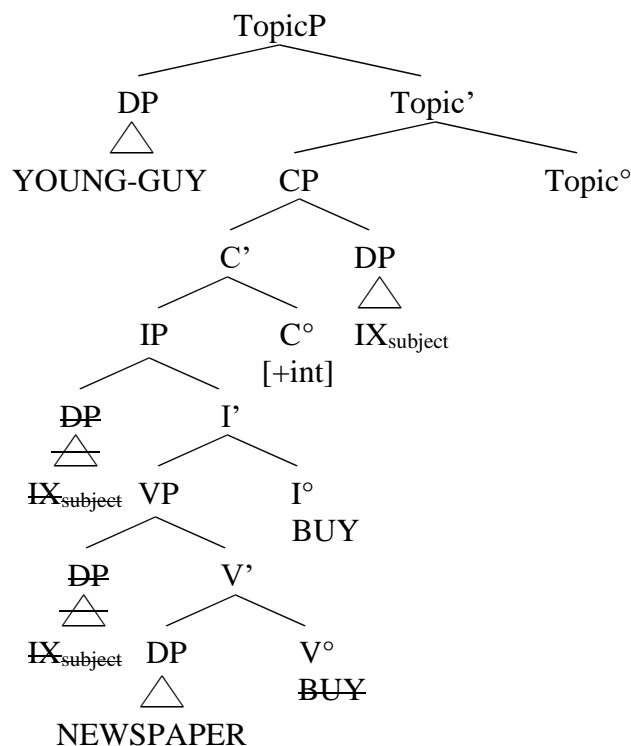
c) *Interrogative clauses: clause-final IX_{subject}*

(34a) YOUNG-GUY NEWSPAPER BUY IX_{subject}?
 ‘Does the young guy buy the newspaper?’

(35a) YOUNG-GUY NEWSPAPER BUY WHEN IX_{subject}?
 ‘When does the young guy buy the newspaper?’

The proposal advanced here views IX_{subject} as the sentence argumental subject, and its positioning as the result of movement. IX_{subject} would move from (Spec, VP), where it is generated, first to (Spec, IP) – and probably other intermediate projections –, up to the specifier of a projection presumably dealing with interrogative force, placed higher than the one hosting the wh- element. As for the first constituent, YOUNG-GUY, it is assumed its being base-generated in Topic Phrase. On the other hand, the second constituent, NEWSPAPER, could be either base-generated in Topic Phrase, in which case the argumental object would be dropped, or be base-generated in (Compl, VP), and thus be the argumental object (the latter case is illustrated in the diagrams below). The choice of one interpretation over the other descends from the distribution of non-manual markers and prosodic cues in the sentence.⁵³

(34b)

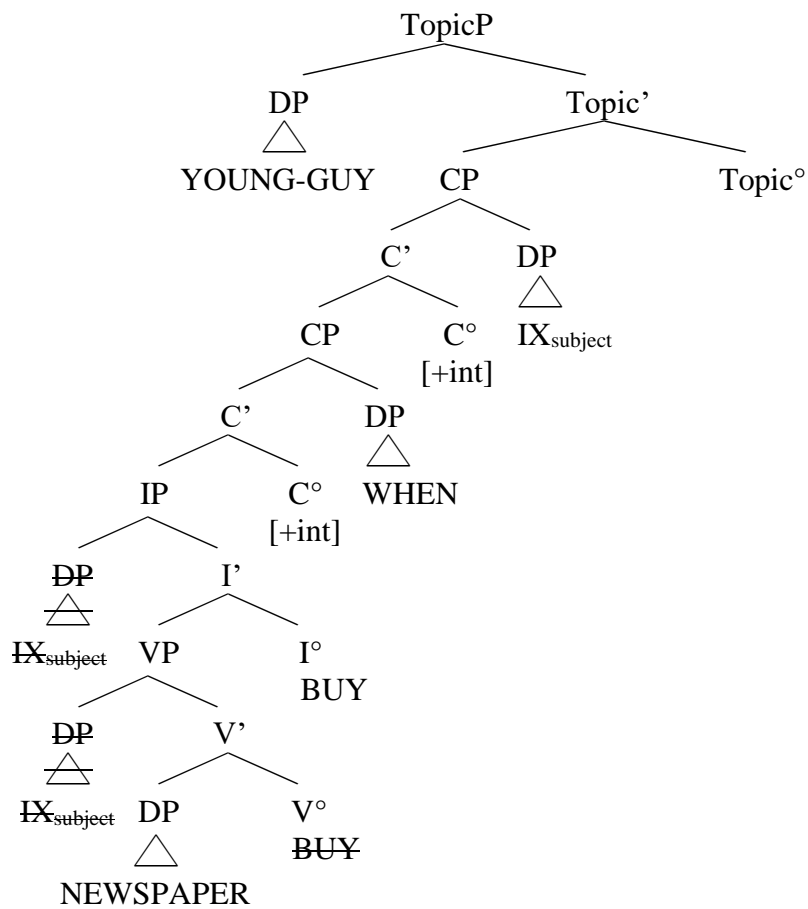


⁵³ Given these signs in this order, the following should be possible:

- a) Topic-subject, Topic-object, ~~subject~~, (dropped object), verb, subject
 YOUNG-GUY-top, NEWSPAPER-top, BUY IX_{subject}?
- b) Topic-subject, ~~subject~~, object, verb, subject
 YOUNG-GUY-top, NEWSPAPER BUY IX_{subject}?

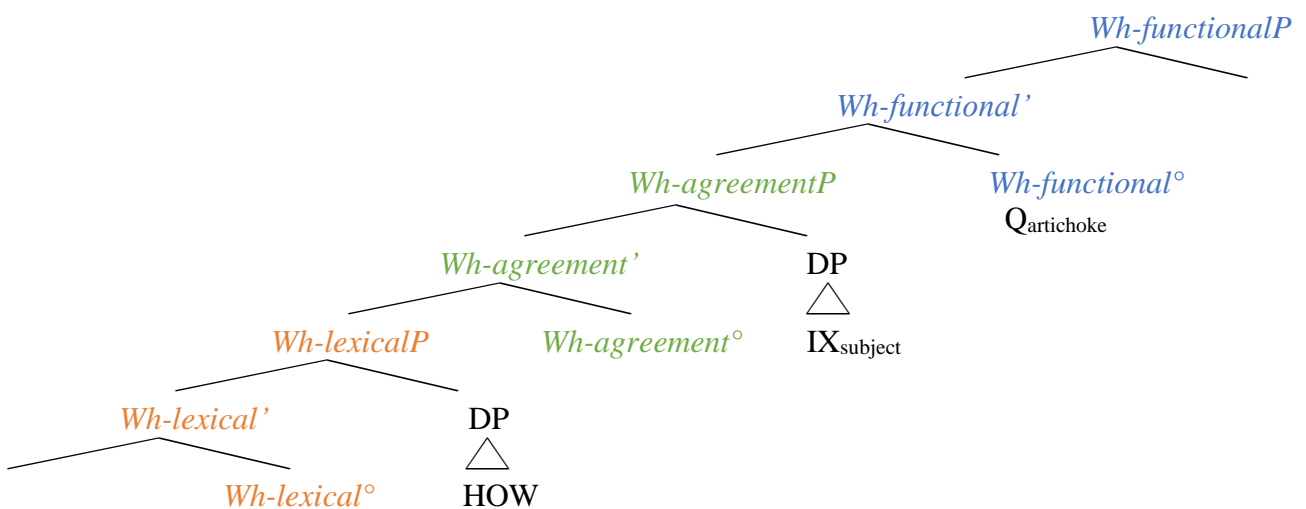
- a) Topic-subject, Topic-object, ~~subject~~, (dropped object), verb, wh-, subject
 YOUNG-GUY-top, NEWSPAPER-top, BUY WHEN IX_{subject}?
- b) Topic-subject, ~~subject~~, object, verb, wh-, subject
 YOUNG-GUY-top, NEWSPAPER BUY WHEN IX_{subject}?

(35b)



In particular, given the grammaticality of strings such as HOW $IX_{subject}$ $Q_{artichoke}$,⁵⁴ I would assume a stratification of the area dealing with interrogatives as follows: a higher functional projection hosting the $Q_{artichoke}$, a middle semi-functional projection hosting the pronoun, and a lower lexical projection hosting the wh- element.⁵⁵

(36)



⁵⁴ See sentence (E12) in Chapter 3.

⁵⁵ This would parallel, to some extent, the overall sentence structure, divided in CP, IP, VP.

d) Interrogative clauses: clause-final IX_{object}

(37a) YOUNG-GUY NEWSPAPER BUY IX_{object}?

(38a) YOUNG-GUY NEWSPAPER BUY IX_{object} WHEN?⁵⁶

(39a) *YOUNG-GUY NEWSPAPER BUY WHEN IX_{object}?

The proposal advanced here considers IX_{object} as initially part of the object DP, and its positioning as the result of movement. IX_{object} would move to the specifier of a higher projection, which could be called Pragmatic Phrase.⁵⁷ The suggestion is that IX_{object} does not occupy the same structural position posited for IX_{subject}: if that was the case, sentence (39a) should be considered grammatical as (35a) above. The ungrammaticality of (39a) would derive from the impossibility for IX_{object}, on one side, to access the structural position dedicated to subject inversion, and on the other side to be part of the interrogative phrase, since the sign WHEN and IX_{object} clearly do not refer to the same entity (see § 4.4.5). As for the first constituent, YOUNG-GUY, it could be either base-generated in Topic Phrase, in which case the argumental subject would be dropped (as in the diagrams in the following pages), or be base-generated in (Spec, VP) and be the argumental subject. Similarly, the NP NEWSPAPER could be base-generated in (another) Topic Phrase, or be in the argumental position (as represented in the diagrams): in the first case, IX_{object} would be a (demonstrative) pronoun, whereas in the second it would be a (demonstrative) adjective. The choice of one interpretation over the other depends on the sentence characteristics as for non-manual markers and prosodic cues.⁵⁸

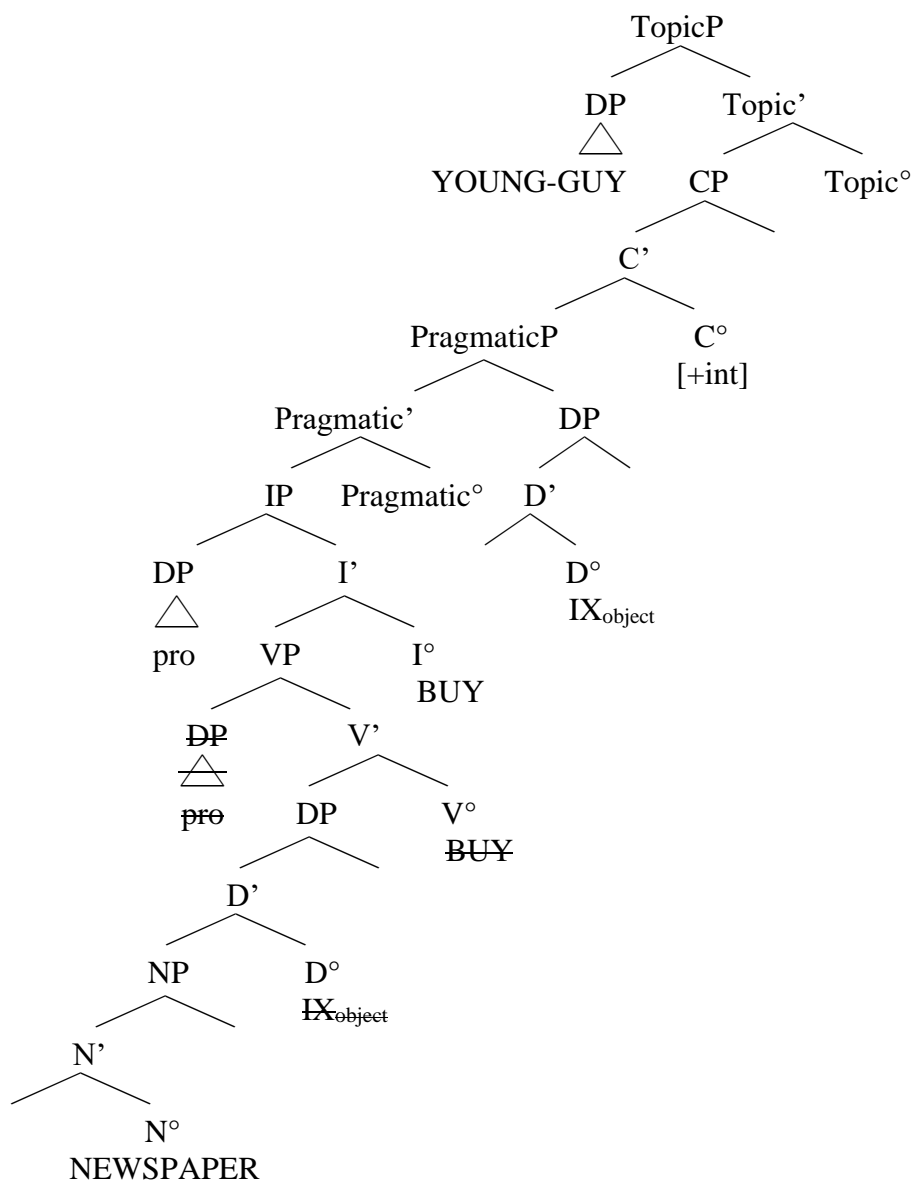
⁵⁶ This structure was produced by one informant only, crucially with an eyeblink before the sign WHEN, and a simultaneous clear change in non-manual markers. This sentence could therefore be a biclausal structure, roughly translatable as: ‘The young guy buy the newspaper, but when (does he)?’. In the text, a proposal for a monoclausal structure is provided.

⁵⁷ The specifier of Pragmatic Phrase is assumed to be linearized to the right, as shown in the diagrams.

⁵⁸ Given these signs in this order, the following should be all possible (in the case of a content interrogative clause, the wh- element would be in the clause-final position):

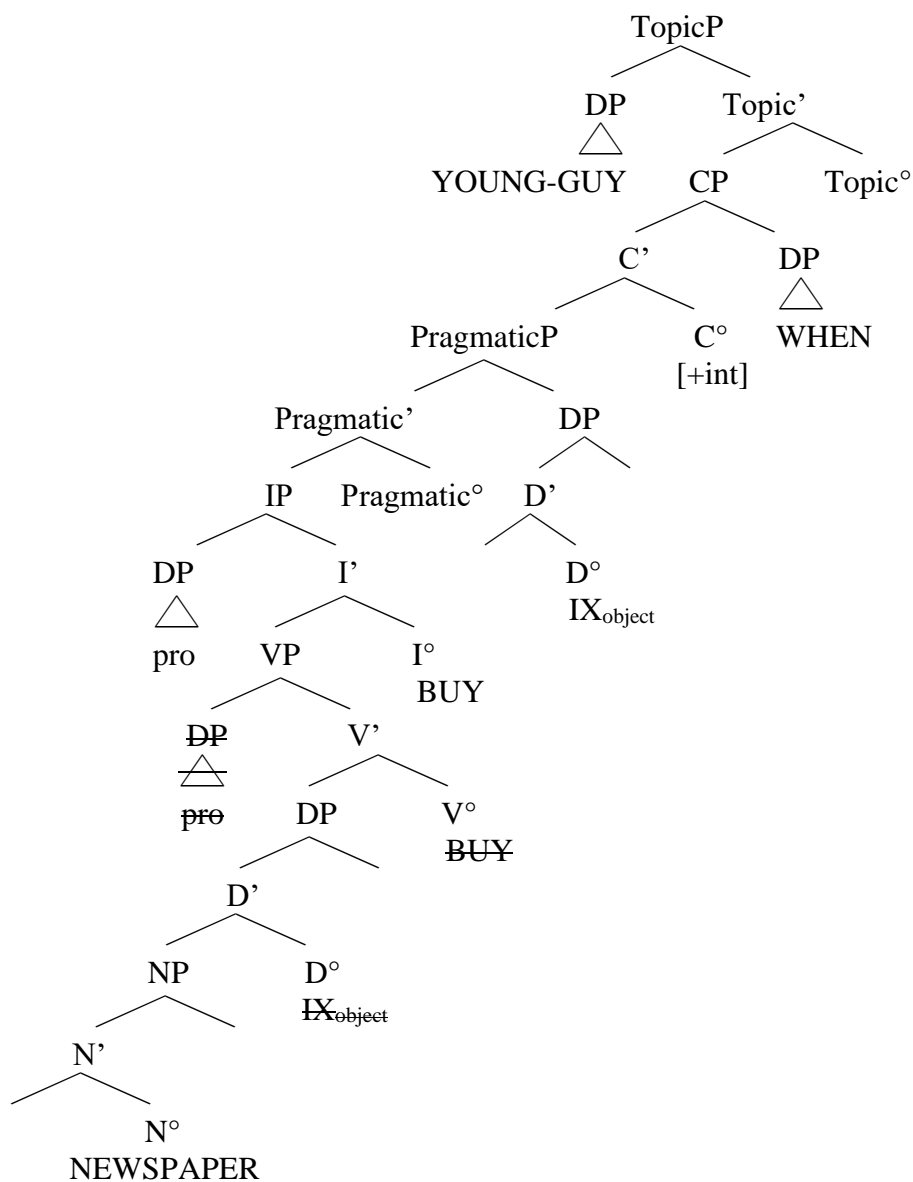
- a) Topic-subject, Topic-object, (dropped subject), (dropped object), verb, demonstrative pronoun IX-object
YOUNG-GUY-top, NEWSPAPER-top, BUY IX_{object}?
- b) Topic-subject, (dropped subject), argumental object, verb, demonstrative adjective IX-object
YOUNG-GUY-top, NEWSPAPER BUY IX_{object}?
- c) Argumental subject, argumental object, verb, demonstrative adjective IX-object
YOUNG-GUY NEWSPAPER BUY IX_{object}?

(37b) YOUNG-GUY NEWSPAPER BUY IX_{object}?⁵⁹



⁵⁹ On a side note, it would be interesting to verify whether an IX_{subject} can occur after IX_{object}. This possibility might be subject to restrictions (for instance, multiple indexical signs might be ruled out), or display an inverted order, i.e., IX_{subject} followed by IX_{object} (although this might be an instance of AUX – see Chapter 1 § 1.3.1).

(38b) YOUNG-GUY NEWSPAPER BUY IX_{object} WHEN?⁶⁰

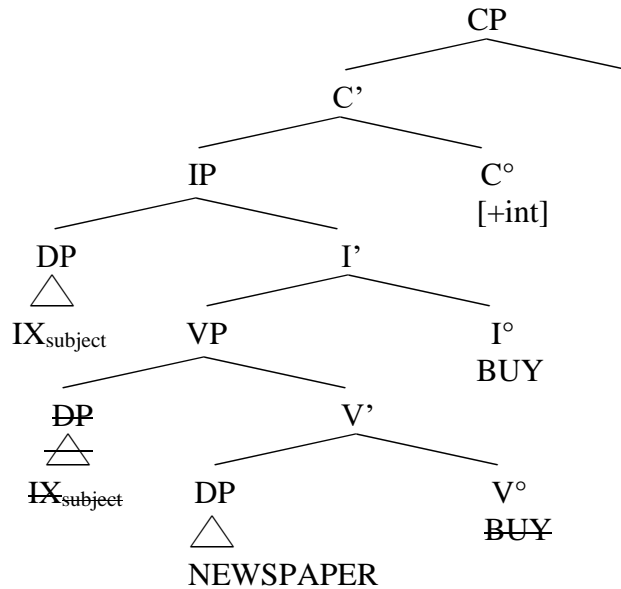


⁶⁰ Similarly to the previous note, a sentence such as YOUNG-GUY NEWSPAPER BUY IX_{object} WHEN IX_{subject}? would be more than welcome to verify the subsistence of different structural projections for IX_{object} and IX_{subject}.

e) *Interrogative sentences without a clause-final IX_{subject}*

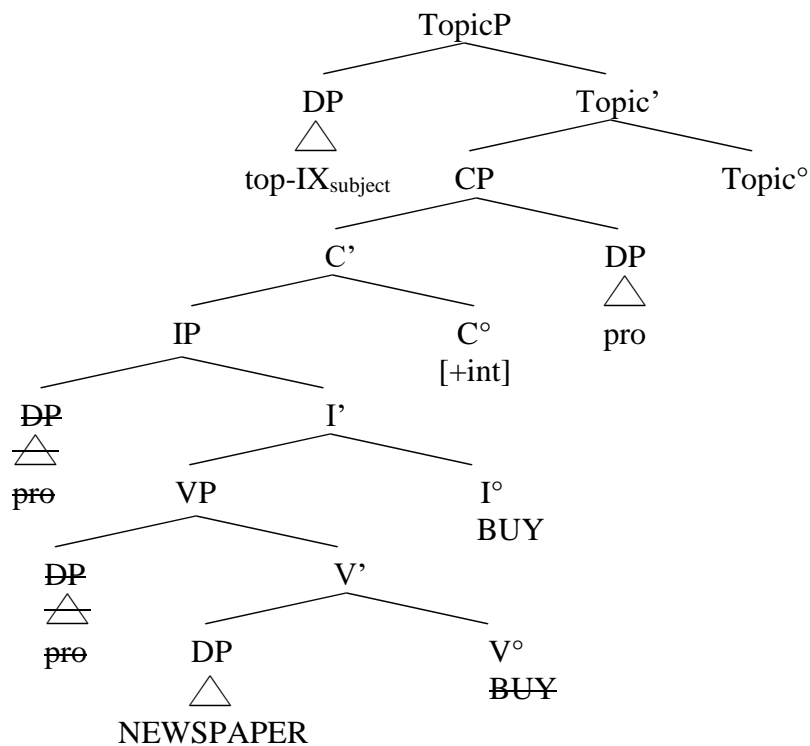
Previously, in § 4.4.4, sentence (22) was represented as follows:

(25a) $\overline{\text{IX}_{\text{subject}}}$ $\overline{\text{NEWSPAPER}}$ $\overline{\text{BUY?}}$ polar int.



At the light of the present discussion, and as a closure as for this section on syntactic features, sentence (22) should be viewed in a different way:

(40) $\overline{\text{IX}_{\text{subject}}}$ $\overline{\text{NEWSPAPER}}$ $\overline{\text{BUY?}}$ polar int.



Sentence (22) would therefore be an instance of:

Topic-subject, (~~pro~~-subject), object, verb, pro subject

In particular, inversion would not take place because of the argumental subject being dropped.⁶¹ I suggest a possible covert inversion of *pro*, which would explain the observed non-manual markers distribution (see § 4.4.4 above).⁶²

4.4.7 Clause-final indexical sign linguistic status

Previous literature on LIS (Bertone, 2011; Calderone, in Branchini and Mantovan (eds.), 2020), described the clause-final indexical sign as being either a strong pronoun, when it features a reduplicated movement and/or displays its own mouthing, or a weak or a clitic pronoun, when it features a single movement and does not display its own mouthing.

In LIS, the distinction between strong, weak, and clitic pronoun is based not only on syntactic properties, but also on articulation time (Bertone and Cardinaletti, 2011; Bertone, 2011: 128). In Bertone and Cardinaletti (2011), strong pronouns are reported to have an articulation time of over 300 ms, weak pronouns of 200-300 ms, and clitic pronouns of under 200 ms (usually around 120 ms). In Bertone (2011), strong pronouns are reported to have an articulation time of about 500 ms, weak pronouns of about 160 ms, and clitic pronouns of about 80 ms.⁶³

In our data, clause-final indexical signs articulation time spans from 100 ms to 1000 ms (hold included), with mean values of 420 ms (hold excluded) in sentences with a plural indexical and an intransitive verb, and 220 ms (hold excluded) in sentences with a singular indexical and a transitive verb. As mentioned earlier, these clause-final indexical signs are characterized by a single movement and by the absence of their own mouthing, while, on the contrary, mouthing spreading from the preceding sign(s) is steadily observed.

Accordingly, solely due to the partition based on articulation time, the indexical signs collected in our study would be at times strong pronouns, weak pronouns, and clitic pronouns. Therefore, at the moment, before this great variation in articulation times, also due to interindividual variation, and the absence of further data, it is not possible to make a conclusive statement on their linguistic status.

However, I suggest that syntactic cliticization and prosodic cliticization should be considered as possible separate phenomena. For instance, these pronouns might even be strong pronouns that appear weakened because of prosodic characteristics of the clause.

If Nespor and Vogel's (1986) Prosodic Phonology theory is taken into consideration, the phonological phrase, which is one of the prosodic units there theorized, should have in LIS, which is considered a left-branching language, its most prominent element as the leftmost. The rightmost element in a phonological phrase should thus be weak, by prosodic characteristics. Therefore, the clause-final indexical sign, being at the end of the clause, and necessarily so at the end of a phonological phrase,

⁶¹ The constituent in Topic Phrase would not be susceptible of subject inversion, since it is not structurally in the projection allowing for that type of movement.

⁶² One could posit that in polar interrogative clauses *pro* reaches the same syntactic position proposed for IX_{subject}, so that a covert inversion is realized, which would explain the standard distribution of interrogative non-manual markers. As for content interrogative clauses distribution of non-manual markers, see Cecchetto, Geraci, and Zucchi (2009).

⁶³ See also footnote 16 in Chapter 2.

is prosodically weak.⁶⁴ Does this imply its syntactic adjoining to the closest head, regardless of which phrase it belongs to? With this suggestion, I would leave, for the moment, the question open.

4.5 Pragmatic features

In this paragraph, pragmatic functions (§ 4.5.1) and pragmatic limitations in the usage of a clause-final indexical sign (§ 4.5.2) will be addressed.

4.5.1 Pragmatic functions

Previous literature on LIS (Bertone, 2011; Calderone, in Branchini and Mantovan (eds.), 2020) associated clause-final indexical signs (referred to as Pronoun Copying) to pragmatic functions such as topic (e.g. topic agreement, familiar topic occurrence), focus (e.g. corrective focus, contrastive focus),⁶⁵ and emphasis.

Data collected in this study – which, clearly, only cover part of the possible pragmatic functions – seem to be related mainly to topic agreement and emphasis. The main departure from previous literature is therefore in the syntactic interpretation of the clause-final indexical sign: while previously interpreted as a copy of a (dropped) pronoun in its canonical position, it is here advanced (§ 4.4) that the clause-final indexical sign is an instance of subject inversion or of extraction from the object DP.

Nonetheless, as for pragmatics, informants who took part to the present study offered copious and detailed insights over usage and differences in meaning, and several pragmatic purposes emerged.

a) *Topic agreement*

The clause-final indexical sign, as also described in previous literature in LIS (Calderone, in Branchini and Mantovan (eds.), 2020), can serve as a topic agreement. This was one of the most common pragmatic functions observed in this study, as beautifully exemplified in (41)⁶⁶ below.

<u>‘ragazzo’</u>	<u>‘giornale’</u>	<u>‘compra’</u>
re		
	hn	hn
		<u>hn+++</u>
	eb	

(41) YOUNG-GUY NEWSPAPER BUY IX_{subject}.
 ‘The young guy buys the newspaper.’

The first constituent, YOUNG-GUY, is identifiable as a topic because of its being marked by raised eyebrows and its being prosodically separated by the rest of the sentence through an eyeblink. The clause-final IX_{subject}, which is here claimed to be the argumental subject, functions pragmatically as topic agreement.

⁶⁴ Conversely, a clause-final indexical sign featuring repeated movement and/or its own mouthing would indicate its being in a different phonological phrase. In this case, since it would be the only element of that phonological phrase, it would be the most prominent, whence the repeated movement and mouthing.

⁶⁵ In contrastive focus, the clause-final indexical sign is reported to feature a repeated movement.

⁶⁶ Sentence (P38) in Chapter 3.

b) Specification

The clause-final indexical sign can well add a layer of meaning in referring to a specific entity or a specific type of a certain entity. This is particularly clear if sentences featuring the clause-final indexical sign are contrasted to sentences that do not feature it, as exemplified below.

- (42) YOUNG-GUY NEWSPAPER BUY.
(43) YOUNG-GUY NEWSPAPER BUY IX_{object}.
'The young guy buys the newspaper.'

In our data, sentences such as (42) refer to a general newspaper, while sentences such as (43) refer to a specific (type of) newspaper. Furthermore, while sentences such as (42) seem to be accepted with a general, simple context, sentences such as (43) need in the context – or discourse – a previous mention of the specific (type) of newspaper.

c) Avoiding misunderstanding by singling out a referent

In some cases, the clause-final indexical sign could be used to avoid misunderstandings in the identification of the relevant entity among two or more entities belonging to the same category.

- (44) IX₁ USUAL PLACE NEWSPAPER SELL IX₁ GO+++ . TODAY MORNING IX₁ GO SEE CL(G-G): 'two people' MOTHER, CHILD, YOUNG, SHY, NEWSPAPER CHOOSE ABLE-TO NOT. AT-THE-END, YOUNG-GUY NEWSPAPER BUY IX_{subject}.
'I am used to going to the newsstand. This morning I went (there) and I saw a mother and her child, who was young and shy, and was not able to choose a newspaper. At the end, the young guy bought the newspaper.'

Since in the context provided there are two possible people who could have bought the newspaper, namely the mother and her young child, the clause-final IX_{subject} could serve the purpose of better clarifying who did the action.

The same could hold for a clause-final IX_{object}, as long as the context provided is appropriate to obtain such an interpretation.⁶⁷

- (45) YOUNG-GUY NEWSPAPER BUY IX_{object}?
'Does the young guy buy the newspaper?'

d) Emphasis

In many cases, the presence of a clause-final indexical sign suggested an emphatic reading, with the entity it referred to seen as emphasized, reinforced, highlighted, as in the following, among many others collected in our data.

- (46) PLACE NEWSPAPER SELL FRIEND POSS₂ EVERYDAY GO+++ . IX₃ NEWSPAPER BUY IX_{subject}?
'Everyday your friend goes to the newsstand. Does he buy the newspaper?'

⁶⁷ Unfortunately, this was not our case: the context provided was not sufficient to have that interpretation of IX_{object}.

This usage, however, is not always possible: for instance, if in the discourse context there is only one relevant referent, there would be no reason to further highlight it through the usage of a clause-final indexical sign, as exemplified in the sentence below.

- (47) M-A-R-C-O IX₃ AGE 18. IX₃ INTELLIGENT CULTURED. IX₃ POLITICS LOVE. MORNING+++ IX₃ PLACE NEWSPAPER SELL GO. IX₃ NEWSPAPER BUY IX_{subject}.
 ‘Marco is eighteen years old. He is intelligent and cultured. He loves politics. Every morning he goes to the newsstand. He buys the newspaper.’

Similarly, it was suggested that a sentence such as (48) below would not be acceptable because of the simultaneous presence of too many salient elements, namely PE_{object} and the clause-final IX_{subject}.

- (48) YOUNG-GUY PE_{object} BUY IX_{subject}?
 ‘Does the young guy buy it?’

e) Surprise, disbelief, astonishment

The clause-final indexical sign can be used to express surprise, disbelief, astonishment over something.

- ‘tu’ ‘lavori’ ‘miracolo’ ‘ti’

 fe
- (49) IX₂ WORK IX₂? MIRACLE! IX₂ TYPE NO.
 ‘Do you work? What a miracle! You’re not really the working type!’

The only difference from the example reported below, taken from Branchini and Mantovan (eds.) (2020) is the absence of mouthing characterizing the clause-final IX₂.

- ‘tu pizza vuoi tu’

 fe
- (50) IX₂ PIZZA WANT IX₂?
 ‘Do you want pizza?’

(Cecchetto (2020), Syntax: 1.2.1 Polar interrogatives)⁶⁸

f) Accusation

In declarative clauses, a clause-final IX_{subject}⁶⁹ could be used to convey an underlying accusation, in which the signer suspects that the interlocutor was the one who did the action referred to. This particular usage is accompanied by specific non-manual markers occurring over the entire sentence, namely squinted eyes, tensed cheeks, right head lean, and smirk; furthermore, a repeated headnod occurs over the clause-final indexical sign.

⁶⁸ This sentence previously appeared as (21) in Chapter 2.

⁶⁹ These examples were provided spontaneously with an IX₂. Although I do not think of possible restrictions based on person and number, future research should verify the possibility to have this peculiar structure with any person.

- _____ 'mangiato'
_____ nmm
- (51) PLATE EAT ALL. IX₂ EAT DONE IX₂.⁷⁰
'The plate is empty. You ate it all, didn't you?'⁷¹

- _____ 'toccato'
_____ nmm
- (52) MOM DISCOVER VASE BREAK. IX₂ TOUCH DONE IX₂.⁷²
'Mom found out that the vase is broken. It was you, wasn't it you?'

g) Confirmation

The clause-final indexical sign can be used to confirm or ask for a confirmation, as in the examples below.

- (53) PLACE NEWSPAPER BUY FRIEND POSS₂ GO. NEWSPAPER CL(B): 'newspapers on the counter' LOOK-AT-THEM. IX₃ IX_{object} BUY IX_{subject}.
'Your friend goes to the newsstand. He looks at the newspapers on the counter. He buys it.'
- (54) YESTERDAY WORKER_K AREA_K STRIKE. BUT TODAY? IX_{3P} WORK IX_{3P}?
'Yesterday workers struck. But, today? Do they work?'
- (55) PLACE NEWSPAPER SELL FRIEND POSS₂ GO. NEWSPAPER CL(B): 'newspapers on the counter' IX₃ EYE-CAUGHT ONE. IX₃ IX_{object} BUY IX_{object}?
'Your friend goes to the newsstand. He is eye-caught by one of the newspapers on the counter. Does he buy it?'

4.5.2 Pragmatic limitations to the usage of a clause-final indexical sign

Although, as seen above, a clause-final indexical sign could be used for a variety of pragmatic purposes, it cannot be used indiscriminately. First, it has to meet a general criterion of discourse coherence; furthermore, the entity to which the clause-final indexical sign refers to has to be previously mentioned in the discourse or be present in the extralinguistic context, while the context should not be either underinformative or overinformative.

a) Discourse coherence: Subject-oriented sentence vs. Object-oriented sentence

The presence of a clause-final IX_{subject} or of a clause-final IX_{object} needs to meet a general criterion of discourse coherence. For instance, if the context is centered on the subject, a clause-final indexical sign emphasizing the object would very unlikely be acceptable.

⁷⁰ Sentence (E2) in Chapter 3.

⁷¹ These sentences are translated into English with a question tag, although they do not necessarily correspond to that from a syntactic standpoint.

⁷² Sentence (E3) in Chapter 3.

- (56) GOOD DAY! EVERYDAY MORNING TIME EIGHT O’CLOCK YOUNG GUY IX₃ HERE NEWSPAPER SELL COME+++ . YOUNG-GUY NEWSPAPER BUY IX_{subject/*object?}
 ‘Good morning! Every morning at eight o’clock a young guy is used to coming here at the newsstand. Does the young guy buy the newspaper?’
- (57) PLACE NEWSPAPER SELL FRIEND POSS₂ EVERYDAY GO+++ . YOUNG-GUY IX_{object} BUY IX_{subject/*object?}
 ‘Everyday your friend goes to the newsstand. Does the young guy buy it?’

The contexts in (56)-(57) above are centered on the subject: thus, a sudden focus shift on the object would result in an unacceptable sentence, although grammatically correct and suitable with another, appropriate context.

b) Previous mention in the discourse

Oftentimes, informants made reference to the fact that the entity the clause-final indexical sign refers to should be known or previously mentioned in the discourse.

- (58) IX₁ USUAL PLACE NEWSPAPER SELL IX₁ GO+++ . TODAY MORNING IX₁ GO SEE CL(G-G): ‘two people’ MOTHER, CHILD, YOUNG, SHY, NEWSPAPER CHOOSE ABLE-TO NOT. AT-THE-END, YOUNG-GUY NEWSPAPER BUY IX_{object}.
 ‘I am used to going to the newsstand. This morning I went (there) and I saw a mother and her child, who was young and shy, and was not able to choose a newspaper. At the end, the young guy bought the newspaper.’

In order for the clause-final IX_{object} to be grammatical, the mention of a specific (type of) newspaper is needed in the previous discourse. Since in the provided context this does not occur, an object interpretation of the indexical sign is ruled out, hence the often observed locative interpretation of the clause-final indexical sign (i.e., ‘The young guy bought the newspaper here’), eased by the similar phonological characteristics of IX_{object} and the locative HERE.⁷³

c) Presence in the extra-linguistic context

The usage of a clause-final indexical sign may be favored by the presence of the referent in the extra-linguistic context. For instance, in (59) below, the usage of the clause-final IX_{subject} would be avoided if the referent was not present in the extra-linguistic context.⁷⁴

- (59) YOUNG-GUY NEWSPAPER BUY WHEN IX_{subject?}
 ‘When does the young guy buy the newspaper?’

⁷³ The indexical sign pointed downwards towards the area of the signing space in which the sign NEWSPAPER was articulated. This pointing direction makes the indexical sign very similar to the locative sign HERE. Analogously, the indexical sign pointing approximately sideways towards the area of the signing space previously associated with the third person subject made the indexical sign similar to the locative sign THERE. This almost perfect overlap of phonological features allowed for a locative interpretation of the clause-final indexical sign. See also § 4.5.2, g) Locative interpretation of the clause-final indexical sign.

⁷⁴ One informant even suggested that in some cases the clause-final indexical sign may function as a gesture, on a par with gestures accompanying spoken languages. This should be examined in future research.

d) Underinformative context

- (60) GOOD DAY! EVERYDAY MORNING TIME EIGHT O’CLOCK YOUNG GUY IX₃ HERE NEWSPAPER SELL COME+++ . YOUNG-GUY NEWSPAPER BUY IX_{object}?
‘Good morning! Every morning at eight o’clock a young guy is used to coming here at the newsstand. Does the young guy buy the newspaper?’

In this case, the discourse context was not informative enough to allow for an IX_{object} interpretation of the clause-final indexical sign, which was instead interpreted as a locative (i.e., ‘Does the young guy buy the newspaper here?’).⁷⁵

e) Overinformative context

- (61) M-A-R-C-O IX₃ AGE 18. IX₃ INTELLIGENT CULTURED. IX₃ POLITICS LOVE. MORNING+++ IX₃ PLACE NEWSPAPER SELL GO. IX₃ NEWSPAPER BUY IX_{subject}.
‘Marco is eighteen years old. He is intelligent and cultured. He loves politics. Every morning he goes to the newsstand. He buys the newspaper.’

In this specific case, the presence of the clause-final IX_{subject} is considered uselessly redundant, since there is only one relevant person who can carry out the action.

f) Variability in context judgements

Nonetheless, while in general terms might be clear what type of contexts might be underinformative or overinformative, there could still be a certain degree of variability in context judgements. The following, with the very same context seen above, makes a nice example to illustrate this.

- (62) M-A-R-C-O IX₃ AGE 18. IX₃ INTELLIGENT CULTURED. IX₃ POLITICS LOVE. MORNING+++ IX₃ PLACE NEWSPAPER SELL GO. IX₃ NEWSPAPER BUY IX_{object}.
‘Marco is eighteen years old. He is intelligent and cultured. He loves politics. Every morning he goes to the newsstand. Does the young guy buy the newspaper?’

Interestingly, opposite explanations for a disprefferal or ungrammaticality of the input sentence were given: while one informant stated that the clause-final IX_{object} is not needed because it was considered redundant, since it can be inferred from the context that the newspaper is a politics one, another informant stated that the clause-final IX_{object} makes the sentence partially acceptable, since there was not a previous mention of a specific newspaper.

g) Locative interpretation of the clause-final indexical sign

Locative interpretations of the clause-final indexical sign occurred with some frequency to be dismissed as a mere interpretation mistake due to inattention or tiredness. If one looks closely to the cases in which this happened, it could be noticed that underinformative context can trigger that.⁷⁶

⁷⁵ The example provided also does not meet the general criterion of discourse coherence, nor features a mention of the referent in the previous discourse.

⁷⁶ In our data, the locative interpretation of the clause-final indexical sign was pointed out by the informants more frequently with an IX_{object} than with an IX_{subject}. Future research should first verify the subsistence of this tendency, then, if confirmed, investigate over possible syntactic reasons underlying it.

- (63) IX₁ USUAL PLACE NEWSPAPER SELL IX₁ GO+++ TODAY MORNING IX₁ GO SEE CL(G-G): ‘two people’ MOTHER, CHILD, YOUNG, SHY, NEWSPAPER CHOOSE ABLE-TO NOT. AT-THE-END, YOUNG-GUY NEWSPAPER BUY IX_{object}.
‘I am used to going to the newsstand. This morning I went (there) and I saw a mother and her child, who was young and shy, and was not able to choose a newspaper. At the end, the young guy bought the newspaper.’

Since in the context there is no mention of a specific (type of) newspaper, the clause-final IX_{object} cannot be interpreted as referring to a specific (type of) newspaper. The only interpretation possible, then, is to take the indexical sign as a locative (the sentence in (63) would therefore mean: ‘The young guy bought the newspaper *here*’), eased by the shared phonological characteristics of the indexical sign and the locative.⁷⁷

4.6 Summary

In this chapter, phonological, morphological, prosodic, syntactic, and pragmatic features of clause-final indexical signs in LIS, from data collected in this study, and in comparison with previous literature, were described and discussed.

As for phonology, the clause-final indexical sign, articulated as a pointing sign with G handshape, was observed to display single, non-repeated path or arc movement (accordingly to its being singular or plural); furthermore, mouthing spreading from the previous sign(s) was steadily observed, resulting in it not featuring its own mouthing or mouth gesture. In addition, it could be subject to hold – because of its being in a clause-final position – and other phonological phenomena, such as orientation assimilation.

As for morphology, the clause-final indexical sign must display spatial agreement and number agreement features.

As for prosody, the clause-final indexical sign was not observed to be preceded by pauses or intonational breaks; its articulation time, overall between 100 ms and 1000 ms (hold included), lies around mean values of 420 ms (hold excluded) for plural indexical signs with an intransitive verb, and 220 ms (hold excluded) for singular indexical signs with a transitive verb.

As for syntax, and in contrast with previous accounts of the phenomenon analyzed as Pronoun Copy (Bertone (2011) and Calderone, in Branchini and Mantovan (eds.) (2020) for LIS), the proposal advanced here views clause-final IX_{subject}S as instances of subject inversion, in either declarative clauses, polar interrogative clauses, and content interrogative clauses: while in declarative clauses it is proposed that the IX_{subject} moves from (Spec, VP), and through intermediate projections, to the specifier of a projection here named Pragmatic Phrase, in interrogative clauses it is proposed that the IX_{subject} moves from (Spec, VP), and through intermediate projections, to the specifier of a projection dealing with interrogative force, situated in the CP area. On the other hand, clause-final IX_{object}S are viewed as instances of extraction from the object DP: IX_{object} – analyzed as a demonstrative adjective or as a demonstrative pronoun, according to the syntactic interpretation given to the object constituent, namely and respectively base-generated in (Compl, VP) or base-generated in (Spec, Topic) – would move from the DP object to the specifier of a projection dealing with pragmatic function (here named Pragmatic Phrase), in both declarative clauses and interrogative clauses. This type of movement is comparable to specifier extraction seen in LIS in those content interrogative

⁷⁷ See also § 4.5.2 b) Previous mention in the discourse, and footnote 73 above.

clauses whose restrictor remains in situ (e.g.: IX₂ BOOK LIKE WHICH?, ‘Which book do you like?’). Furthermore, a stratification of the CP area dealing with wh- elements was proposed, due to the grammaticality of strings such as HOW IX₂ Q_{artichoke}, thus divided into a higher functional projection hosting Q_{artichoke}, a mid semi-functional projection hosting the pronoun, and a lower lexical projection hosting the interrogative element.

As for pragmatics, data collected in this study align with previous accounts (Calderone, in Branchini and Mantovan (eds.) (2020) for LIS). In particular, clause-final indexical signs are associated to pragmatic functions such as: topic agreement; specification of the referent; avoiding misunderstanding by singling out the relevant entity among two or more entities belonging to the same category; emphasis; expression of surprise, disbelief, and astonishment; accusation; confirmation or request for confirmation. In addition, the usage of a clause-final indexical sign should be made in a context of general discourse coherence: plus, the entity to which the clause-final indexical sign refers to should be known, previously mentioned in the discourse, or present in the extra-linguistic context. An unfitting context could lead to a locative interpretation of the clause-final indexical sign.

Conclusions

In this thesis, a preliminary study on clause-final indexical signs in Italian Sign Language (LIS) was conducted.

Clause-final indexical signs are an optional phenomenon attested in several sign languages. For instance, clause-final indexical signs referred to the sentence subject are described as Subject Pronoun Copy in ASL (Padden 1988, 2017). Furthermore, clause-final indexical signs are claimed to be only referable to the sentence subject in NGT (Bos 1995); however, following studies on NGT (Crasborn et al. 2009), which claimed clause-final indexical signs to be an instance of topic agreement, showed that they can be referred to any kind of topic (both argumental and non-argumental). Nonetheless, in DGS the clause-final indexical sign can only be referred to the sentence subject and cannot be referred to the object or other constituents (Loos 2020). Therefore, while more studies are addressing the issue, it appears that, across sign languages, the phenomenon is subject to both different restrictions and analyses.

Previous literature on LIS described the phenomenon as pronoun reduplication (Bertone 2011) and pronoun copying (Calderone 2020). Attested in a variety of syntactic structures, such as declarative clauses, polar interrogative clauses, content interrogative clauses, subordinate clauses, and object topicalizations, it is reported to be more likely in interrogative clauses, and with a clause-final subject indexical sign. The clause-final indexical sign, either subject or (direct) object, is considered to be a pronoun, either clitic, weak, or strong, according to the specific characteristics displayed by features such as articulation time, movement repetition, and mouthing. Clause-final indexical signs are associated to pragmatic functions such as topic (e.g., topic agreement, familiar topic occurrence), focus (e.g., corrective focus, contrastive focus), and emphasis.

This study was aimed at better framing and understanding the phenomenon, as well as attempting to determine the clause-final indexical sign linguistic status and the extent of its usage. In particular, it was aimed at verifying the grammaticality of the clause-final indexical sign in context, depending on: sentence type (i.e., declarative clause, polar interrogative clause, content interrogative clause); type of verb (i.e., intransitive or transitive); type of overt realization of the antecedent within the sentence (i.e., noun phrase or pronominal form); type of clause-final indexical sign (i.e., IX_{subject} or IX_{object}); clause-final indexical sign number feature (i.e., singular or plural).

To investigate the phenomenon, four deaf native LIS signers participated to the study, and were administered a grammaticality judgement task and a sentence repetition task. The 44 input sentences provided to the informants, shown on screen and presented in different orders in the two tasks, were signed by a deaf native LIS signer, who also provided grammaticality judgements.

Data analyzed in this study, consisting in detailed grammaticality judgements and in 131 sentences, show that clause-final indexical signs can occur in all the grammatical structures tested, except for clause-final IX_{object} s in content interrogative clauses. Furthermore, the type of overt realization of sentence constituents (i.e., noun phrase or pronominal form), does not seem to particularly influence the possibility to have a clause-final indexical sign: nonetheless, slight tendencies in (dis)favoring the clause-final indexical sign were observed.

As for phonological features, the clause-final indexical sign consists in a pointing sign with a G handshape that displays a single, non-repeated path or arc movement, accordingly to its being singular or plural. Not characterized by its own mouthing or mouth gesture, it steadily displays mouthing spreading from preceding sign(s). As for non-manual markers specifically marking the clause-final indexical sign, a single or repeated headnod often occurs in declarative clauses, while no non-manual

markers are observed in interrogative clauses. On the other hand, non-manual markers occurring on previous signs spread over it. As for phonological phenomena, hold, as well as progressive orientation assimilation, are observed.

As for morphological features, the clause-final indexical sign must display spatial agreement and number agreement with the entity it refers to. Collected data suggest that plural clause-final indexical signs are disfavored over singular clause-final indexical signs, as well as third-person indexical signs are disfavored over second-person indexical signs: at present, it is here suggested this to be due to phonological reasons, such as articulatory constraints or ease of articulation.

As for prosodic features, it is observed that the clause-final indexical sign is not preceded by pauses or prosodic cues.

As for articulation time, clause-final indexical signs show a duration included between a minimum of about 100 ms and a maximum of over 1000 ms (hold included).

As for the pragmatic functions of clause-final indexical signs, data collected in this study align with previous accounts, in that the clause-final sign is related to a variety of pragmatic purposes. In particular, the clause-final indexical sign could be used to: express topic agreement; specify an entity, or a type of entity; single out a referent to avoid misunderstandings; convey emphasis; show surprise, disbelief, astonishment; make an accusation; confirm or ask for confirmation. Context plays a fundamental role in the licensing of a clause-final indexical sign, for the entity to which the clause-final indexical sign refers to has to be previously mentioned in the discourse or be present in the extralinguistic context.

The proposal here advanced as for the syntactic interpretation of clause-final indexical signs in LIS diverges from the previous accounts aforementioned; plus, it marks a distinction between declarative clauses and interrogative clauses, as well as between clause-final subject indexical signs and clause-final object indexical signs. The differentiation between clause-final subject indexical signs and clause-final object indexical signs descends from the ungrammaticality observed in content interrogative clauses, in which the latter are ruled out.

In declarative clauses, the clause-final subject indexical sign is interpreted as being the argumental subject moved to a projection dealing with pragmatic functions such as emphasis, while the clause-initial ‘subject’ constituent – if present – is interpreted as being base-generated in a Topic Phrase projection. Similarly, the clause-final object indexical sign is interpreted as being extracted from the projection hosting the object phrase and moved to a projection dealing with pragmatic functions such as emphasis. The type of movement involved is akin to the one observed in LIS in content interrogative clauses in which a *wh*-element moves while its lexical restriction is left in situ (Cecchetto, Geraci, Zucchi 2009). The clause-final object indexical sign should be interpreted as being a demonstrative pronoun when the ‘object’ constituent is base-generated in Topic Phrase, or as being a demonstrative adjective when the argumental object is in its canonical position.

In interrogative clauses, the clause-final subject indexical sign is interpreted as being the argumental subject moved to a projection, placed in the CP area, dealing with interrogative force, while the clause-initial ‘subject’ constituent – if present – is interpreted as being base-generated in a Topic Phrase projection. On the contrary, in interrogative clauses, the clause-final object indexical sign is interpreted as being extracted from the projection hosting the object phrase and moved to a projection, placed lower than the ones in the interrogative area of CP, dealing with pragmatic functions such as emphasis, as seen above for declarative clauses with a clause-final object indexical sign.

Striving for a unified account of various data available in this study, a stratification of the CP area dealing with interrogative force was also advanced. Specifically, there would be a higher functional projection hosting $Q_{\text{artichoke}}$, a mid-functional projection hosting the indexical sign, and a lower lexical projection hosting the *wh*-element and – if present – its lexical restriction.

As this is a preliminary study, data need to be expanded and consolidated, so that various issues could be addressed and the following current open questions could be answered: a) the possible non-homophony of the clause-final indexical sign in relation to its pronominal antecedent in the sentence, as well as other phonological phenomena, should be researched; b) it should be clarified whether the factors favoring singular and second-person clause-final indexical signs are phonological, morphological, or syntactic in nature; c) other sentence types, syntactic structures, and verb types should be investigated; d) the linguistic status of the clause-final indexical sign should be clarified; e) the found asymmetry as for post-wh clause-final subject or object indexical signs in interrogative clauses should be better understood; f) factors (dis)favoring the presence of a clause-final indexical sign, on the syntactic and pragmatic level should be further investigated.

Appendix A

Contexts used in the grammaticality judgement task and in the sentence repetition task

The following contexts were used in the grammaticality judgement task and in the sentence repetition task in order to provide the same background to the input sentences informants were given. In the grammaticality judgement task, contexts were shown in alphabetical order, whereas in the sentence repetition task they were shown in a different order, namely D, H, A, I, E, C, F, J, B, K, G, L.

Context A

YESTERDAY WORKER_K AREA_K STRIKE, INSTEAD TODAY –¹
'Yesterday workers struck, instead today –'

Context B

YESTERDAY WORKER_K AREA_K STRIKE. BUT TODAY?
'Yesterday workers struck. But, today?'

Context C

BANK STREET_A ROME_A, OFFICE-WORKER_K AREA_K, STREET_B MILAN_B CHANGE
A_{MOVE}_B. IX_{3P} CONTRACT CHANGE₊₊₊, TIME SLOT, WEEK DATE CHANGE₊₊₊. IX₁
UNDERSTAND NOTHING. IX₂ SITUATION KNOW WELL –
'The office workers of the bank (office) in Rome Street were moved to (the bank office in) Milan Street. Their contract completely changed: their working hours and working days changed. I did not understand anything (about it). You know the situation well –'

Context D

IX₁ USUAL PLACE NEWSPAPER SELL IX₁ GO₊₊₊. TODAY MORNING IX₁ GO SEE CL(G-G): 'two people' MOTHER, CHILD, YOUNG, SHY, NEWSPAPER CHOOSE ABLE-TO NOT. AT-THE-END –
'I am used to going to the newsstand. This morning I went (there) and I saw a mother and her child, who was young and shy, and was not able to choose a newspaper. At the end –'

Context E

PLACE NEWSPAPER SELL NEWSPAPER LAST THERE-IS.
'At the newsstand, there is the last newspaper.'

Context F

M-A-R-C-O IX₃ AGE 18. IX₃ INTELLIGENT CULTURED. IX₃ POLITICS LOVE. MORNING₊₊₊ IX₃ PLACE NEWSPAPER SELL GO.
'Marco is eighteen years old. He is intelligent and cultured. He loves politics. Every morning he goes to the newsstand.'

¹ AREA is a sign used to pluralize a referent or to define a group of people. It is manually homophonous to the sign AREA/PLACE, but lacks mouthing. It usually displays mouthing spreading of the noun it refers to. It was chosen to use AREA to avoid the usage of a pronominal IX marking plural, so that the first instance of the pronoun was in the input sentence.

Context G

PLACE NEWSPAPER BUY FRIEND POSS₂ GO. NEWSPAPER CL(B): ‘newspapers on the counter’ LOOK-AT-THEM.

‘Your friend goes to the newsstand. He looks at the newspapers on the counter.’

Context H

GOOD DAY! EVERYDAY MORNING TIME EIGHT O’CLOCK YOUNG GUY IX₃ HERE NEWSPAPER SELL COME+++.

‘Good morning! Every morning at eight o’clock a young guy is used to coming here at the newsstand.’

Context I

OH NO! IX₁ SEE NEWSPAPER FINISHED! BUT BEFORE IX₁ ENTER IX₁ YOUNG CL(G-G): ‘one person enters, another person exits’ EXIT.

‘Oh no! The newspapers are all sold out! Well, actually I saw a young guy coming out when I got here.’

Context J

PLACE NEWSPAPER SELL FRIEND POSS₂ EVERYDAY GO+++.

‘Everyday your friend goes to the newsstand.’

Context K

PLACE NEWSPAPER SELL FRIEND POSS GO. NEWSPAPER CL(B): ‘newspapers on the counter’ IX₃ EYE-CAUGHT ONE.

‘Your friend goes to the newsstand. He is eye-caught by one of the newspapers on the counter.’

Context L

HOUSE IN-FRONT-OF POSS₂ IX_{3P} PEOPLE HABIT POSS_{3P}. IX₂ TIME-AGO₂ TELL₁ FATHER_A IX_A EVERY-MONDAY CAFÉ GO, MOTHER EVERY-TUESDAY GYM GO. INSTEAD SON_B IX_B NEWSPAPER BUY WEEK DAY WHICH IX₁ KNOW NOT.

‘Your neighbours have their habits. Once you told me that the father goes to the café every Monday and that the mother goes to the gym every Tuesday. Their son buys the newspaper, but I do not know in which day of the week.’

Appendix B

Input sentences used in the grammaticality judgement task and in the sentence repetition task

The following input sentences were used in the grammaticality judgement task and in the sentence repetition task. In both tasks, input sentences were shown accordingly with the order in which contexts were shown, thus, in the grammaticality judgement task they were shown in alphabetical order, whereas in the sentence repetition task they were shown in a different order, namely D, H, A, I, E, C, F, J, B, K, G, L.

Input sentences are listed with their sentence code (e.g., A1, in which the letter identifies the related context) with their intended meaning, or, in different terms, with the meaning the author of the study desired to test. Informants might have accepted a given input sentence with the here transcribed intended meaning, with another meaning, or might have deemed it ungrammatical. The reader is referred to Chapter 3 for more detailed information on sentences grammaticality.

- A1 IX_{3P} WORK.
- A2 IX_{3P} WORK IX_{3P}.
- A3 WORK IX_{3P}.
- A4 IX_{3P} WORK IX.
- A5 IX WORK IX_{3P}
'They work.'

- B1 IX_{3P} WORK?
- B2 IX_{3P} WORK IX_{3P}?
- B3 WORK IX_{3P}?
- B4 IX_{3P} WORK IX?
- B5 IX WORK IX_{3P}?
'Do they work?'

- C1 IX_{3P} WORK WHEN?
- C2 IX_{3P} WORK WHEN IX_{3P}?
- C3 WORK WHEN IX_{3P}?
- C4 IX_{3P} WORK IX_{3P} WHEN?
- C5 WORK IX_{3P} WHEN?
'When do they work?'

- D1 YOUNG-GUY¹ NEWSPAPER BUY.
- D2 YOUNG-GUY NEWSPAPER BUY IX_{subject}.
- D3 YOUNG-GUY NEWSPAPER BUY IX_{object}.
'The young guy buys the newspaper.'²

¹ The sign YOUNG-PERSON can be used for both females and males. Since the mouthing used in the input sentences – and by the informants – is either unexpressed on the sign and on the pronouns that refer to it, or is at the masculine form, the sign has been glossed directly as YOUNG-GUY.

² In contexts D-K the sentences are here translated with a present tense, as a default translation of a sentence disanchored from any time reference. However, the interpretation of the sentence *in context* might require a past tense verb. The reader is referred to Chapter 3 for further details.

- E1 YOUNG-GUY IX_{object} BUY.
 E2 YOUNG-GUY IX_{object} BUY IX_{subject}.
 E3 YOUNG-GUY IX_{object} BUY IX_{object}.
 ‘The young guy buys it.’
- F1 IX₃ NEWSPAPER BUY.
 F2 IX₃ NEWSPAPER BUY IX_{subject}.
 F3 IX₃ NEWSPAPER BUY IX_{object}.
 ‘He buys the newspaper.’
- G1 IX₃ IX_{object} BUY.
 G2 IX₃ IX_{object} BUY IX_{subject}.
 G3 IX₃ IX_{object} BUY IX_{object}.
 ‘He buys it.’
- H1 YOUNG-GUY NEWSPAPER BUY?
 H2 YOUNG-GUY NEWSPAPER BUY IX_{subject}?
 H3 YOUNG-GUY NEWSPAPER BUY IX_{object}?
 ‘Does the young guy buy the newspaper?’
- I1 YOUNG-GUY IX_{object} BUY?
 I2 YOUNG-GUY IX_{object} BUY IX_{subject}?
 I3 YOUNG-GUY IX_{object} BUY IX_{object}?
 ‘Does the young guy buy it?’
- J1 IX₃ NEWSPAPER BUY?
 J2 IX₃ NEWSPAPER BUY IX_{subject}?
 J3 IX₃ NEWSPAPER BUY IX_{object}?
 ‘Does he buy the newspaper?’
- K1 IX₃ IX_{object} BUY?
 K2 IX₃ IX_{object} BUY IX_{subject}?
 K3 IX₃ IX_{object} BUY IX_{object}?
 ‘Does he buy it?’
- L1 YOUNG-GUY NEWSPAPER BUY WHEN?
 L2 YOUNG-GUY NEWSPAPER BUY WHEN IX_{subject}?
 L3 YOUNG-GUY NEWSPAPER BUY WHEN IX_{object}?
 L4 YOUNG-GUY NEWSPAPER BUY IX_{subject} WHEN?
 L5 YOUNG-GUY NEWSPAPER BUY IX_{object} WHEN?
 ‘When does the young guy buy the newspaper?’

Appendix C

Input sentences characteristics

The table below lists the sentences, referred to with their assigned code (e.g., A1, A2, and so forth), specifying their characteristics as for: sentence type, namely declarative clause, polar interrogative clause, or content interrogative clause; verb class, namely intransitive unergative, or transitive; subject in non-marked argumental position realization type, namely NP or pronoun; object in non-marked argumental position realization type, namely NP or pronoun; IX characteristics, namely co-referent with the subject, co-referent with the object. IX is usually clause-final, unless where differently specified. Sentences A-C feature a third-person plural subject [+animate, +human], whereas sentences D-L feature a third-person singular subject [+animate, +human] and a singular object [-animate].

Code	Sentence type	Verb	Subject	Object	IX
A1	Declarative	Intransitive	Pronominal	-	-
A2	Declarative	Intransitive	Pronominal	-	IX-subj
A3	Declarative	Intransitive	-	-	IX-subj
A4	Declarative	Intransitive	Pronominal	-	IX-subj singular (sentence-final)
A5	Declarative	Intransitive	Pronominal (sentence-final)	-	IX-subj singular (sentence-initial)
B1	Polar int.	Intransitive	Pronominal	-	-
B2	Polar int.	Intransitive	Pronominal	-	IX-subj
B3	Polar int.	Intransitive	-	-	IX-subj
B4	Polar int.	Intransitive	Pronominal	-	IX-subj singular (sentence-final)
B5	Polar int.	Intransitive	Pronominal (sentence-final)	-	IX-subj singular (sentence-initial)
C1	Content int.	Intransitive	Pronominal	-	-
C2	Content int.	Intransitive	Pronominal	-	IX-subj (post-wh)
C3	Content int.	Intransitive	-	-	IX-subj (post-wh)
C4	Content int.	Intransitive	Pronominal	-	IX-subj (pre-wh)
C5	Content int.	Intransitive	-	-	IX-subj (pre-wh)
D1	Declarative	Transitive	NP	NP	-
D2	Declarative	Transitive	NP	NP	IX-subj
D3	Declarative	Transitive	NP	NP	IX-obj

E1	Declarative	Transitive	NP	Pronominal	-
E2	Declarative	Transitive	NP	Pronominal	IX-subj
E3	Declarative	Transitive	NP	Pronominal	IX-obj
F1	Declarative	Transitive	Pronominal	NP	-
F2	Declarative	Transitive	Pronominal	NP	IX-subj
F3	Declarative	Transitive	Pronominal	NP	IX-obj
G1	Declarative	Transitive	Pronominal	Pronominal	-
G2	Declarative	Transitive	Pronominal	Pronominal	IX-subj
G3	Declarative	Transitive	Pronominal	Pronominal	IX-obj
H1	Polar int.	Transitive	NP	NP	-
H2	Polar int.	Transitive	NP	NP	IX-subj
H3	Polar int.	Transitive	NP	NP	IX-obj
I1	Polar int.	Transitive	NP	Pronominal	-
I2	Polar int.	Transitive	NP	Pronominal	IX-subj
I3	Polar int.	Transitive	NP	Pronominal	IX-obj
J1	Polar int.	Transitive	Pronominal	NP	-
J2	Polar int.	Transitive	Pronominal	NP	IX-subj
J3	Polar int.	Transitive	Pronominal	NP	IX-obj
K1	Polar int.	Transitive	Pronominal	Pronominal	-
K2	Polar int.	Transitive	Pronominal	Pronominal	IX-subj
K3	Polar int.	Transitive	Pronominal	Pronominal	IX-obj
L1	Content int.	Transitive	NP	NP	-
L2	Content int.	Transitive	NP	NP	IX-subj (post-wh)
L3	Content int.	Transitive	NP	NP	IX-obj (post-wh)
L4	Content int.	Transitive	NP	NP	IX-subj (pre-wh)
L5	Content int.	Transitive	NP	NP	IX-obj (pre-wh)

Appendix D

Grammaticality judgements

The following tables display grammaticality judgements collected in the grammaticality judgement task and in the sentence repetition task. The leftmost column contains the sentence code (e.g., A1, A2, A3, and so forth); the first two columns at its right contain data from the grammaticality judgement task, further divided for ‘given context’ and ‘other context’; the two rightmost columns contain data from the sentence repetition task, further divided for ‘given context’ and ‘other context’.

Informant 01 ¹				
	Grammaticality judgement task		Sentence repetition task	
	Given context	Other context	Given context	Other context
A1	Grammatical		Grammatical	
A2	Ungrammatical		Ungrammatical	
A3	Partially grammatical		Grammatical	
A4	Ungrammatical*		Ungrammatical	
A5	Ungrammatical*		Ungrammatical	
B1	Grammatical		Grammatical	
B2	Partially grammatical		Ungrammatical	
B3	Grammatical		Grammatical	
B4	Partially grammatical		Ungrammatical*	
B5	Ungrammatical		Ungrammatical*	
C1	Grammatical		Grammatical	
C2	Grammatical**		Ungrammatical	
C3	Grammatical		Partially grammatical	
C4	Grammatical**		Ungrammatical	
C5	Grammatical		Ungrammatical	
D1	Grammatical		Grammatical	
D2	Ungrammatical*		Ungrammatical	
D3	Grammatical**		Grammatical	
E1	Grammatical		Grammatical	
E2	Grammatical**		Grammatical**	

¹ * In the grammaticality judgement task, sentences A4, A5, D2, H3, I2, I3, J3, L3 were considered grammatical if the indexical sign was given a locative interpretation. In particular, the ungrammaticality of sentences H3, I2, and I3 was related to a possible interpretation ambiguity between a locative reading and a co-referent reading. Similarly, in the sentence repetition task, sentences B4 and B5 were considered grammatical with a locative interpretation of the indexical sign.

** These sentences are accepted yet disliked.

*** These sentences are accepted but preferred with other contexts.

E3	Grammatical		Grammatical	
F1	Grammatical		Grammatical	
F2	Ungrammatical		Ungrammatical	
F3	Grammatical***		Grammatical***	
G1	Grammatical		Grammatical	
G2	Grammatical**		Ungrammatical	
G3	Grammatical**/**		Ungrammatical	Grammatical
H1	Grammatical		Grammatical	
H2	Grammatical		Grammatical	
H3	Ungrammatical*		Ungrammatical	Grammatical
I1	Grammatical		Grammatical	
I2	Ungrammatical*		Grammatical**	
I3	Ungrammatical*		Grammatical	
J1	Grammatical		Grammatical	
J2	Grammatical		Grammatical	
J3	Ungrammatical*		Grammatical	
K1	Grammatical		Grammatical	
K2	Grammatical**		Ungrammatical	
K3	Grammatical		Grammatical	
L1	Grammatical		Grammatical	
L2	Grammatical**		Ungrammatical	
L3	Ungrammatical*		Ungrammatical	
L4	Ungrammatical		Ungrammatical	
L5	Grammatical		Ungrammatical	Grammatical

Informant 02 ²				
	Grammaticality judgement task		Sentence repetition task	
	Given context	Other context	Given context	Other context
A1	Grammatical		Grammatical	
A2	Grammatical		Grammatical	
A3	Ungrammatical		Grammatical	
A4	Ungrammatical*		Ungrammatical	
A5	Ungrammatical		Ungrammatical	
B1	Grammatical		Grammatical	
B2	Grammatical**		Grammatical	
B3	Grammatical**		Grammatical	
B4	Ungrammatical*		Ungrammatical*	
B5	Ungrammatical*		Ungrammatical	
C1	Grammatical		Grammatical	
C2	Grammatical**		Ungrammatical	
C3	Grammatical		Grammatical	
C4	Ungrammatical		Grammatical	
C5	Grammatical****		Grammatical	
D1	Grammatical		Grammatical	
D2	Ungrammatical*		Grammatical	
D3	Partially grammatical*		Grammatical	
E1	Grammatical		Grammatical	
E2	Grammatical**		Partially grammatical	
E3	Grammatical		Grammatical	
F1	Grammatical		Grammatical	
F2	Grammatical		Grammatical	
F3	Grammatical		Grammatical	
G1	Grammatical		Grammatical	
G2	Ungrammatical		Ungrammatical	Grammatical

² * In the grammaticality judgement task, sentences A4, B4, B5, D2, D3, H3 were considered grammatical if the indexical sign was given a locative interpretation. In the production task, sentences B4, L5 were considered grammatical if the indexical sign was given a locative interpretation.

** These sentences are accepted yet disliked.

*** These sentences are accepted but preferred with other contexts.

**** In the grammaticality judgement task, sentence C5 allowed for a nominal interpretation of the sign WORK. See § 3.5.1.3 for further details.

^ In the grammaticality judgement task, sentence L3 was judged grammatical with the interrogative sign MOTIVO ('why').

G3	Grammatical		Grammatical	
H1	Grammatical		Grammatical	
H2	Grammatical		Grammatical	
H3	Ungrammatical*	Grammatical	Grammatical	
I1	Grammatical		Grammatical	
I2	Grammatical		Grammatical	
I3	Partially grammatical	Grammatical	Grammatical	
J1	Grammatical		Grammatical	
J2	Grammatical		Grammatical	
J3	Grammatical		Grammatical	
K1	Ungrammatical	Grammatical	Grammatical	
K2	Grammatical**		Grammatical	
K3	Grammatical		Grammatical	
L1	Grammatical		Grammatical	
L2	Grammatical		Partially grammatical	
L3	Ungrammatical	Grammatical^	Ungrammatical	
L4	Grammatical		Grammatical	
L5	Grammatical		Ungrammatical*	

Informant 03 ³				
	Grammaticality judgement task		Sentence repetition task	
	Given context	Other context	Given context	Other context
A1	Grammatical		Grammatical	
A2	Grammatical**		Grammatical	
A3	Grammatical		Ungrammatical	
A4	Ungrammatical*		Ungrammatical*	
A5	Ungrammatical		Ungrammatical	
B1	Grammatical		Grammatical	
B2	Grammatical**		Grammatical	
B3	Grammatical		Grammatical	
B4	Ungrammatical*		Ungrammatical*	
B5	Ungrammatical		Ungrammatical*	
C1	Grammatical		Grammatical	
C2	Grammatical**		Grammatical	
C3	Ungrammatical		Ungrammatical	
C4	Ungrammatical		Grammatical	
C5	Grammatical		Grammatical	
D1	Grammatical		Grammatical	
D2	Partially grammatical		Grammatical	
D3	Grammatical**		Grammatical	
E1	Grammatical		Grammatical	
E2	Partially grammatical	Partially grammatical	Ungrammatical	
E3	Grammatical		Grammatical	
F1	Grammatical		Grammatical	
F2	Partially grammatical		Grammatical	
F3	Grammatical		Grammatical	
G1	Grammatical		Grammatical	

³ * In the grammaticality judgement task, sentences A4, B4 were considered grammatical if the indexical sign had a locative interpretation. In the sentence repetition task, sentences A4, B4, B5 were considered grammatical if the indexical sign had a locative interpretation.

** These sentences are accepted yet disliked.

*** These sentences are accepted but preferred with other contexts.

**** In the grammaticality judgement task, sentences I1, I2, I3 were considered ungrammatical because of the lack, in the input sentence, of the sign DONE. If the sign DONE was included in the sentences, they would have been perfectly grammatical. The necessity of the aspectual marker was linked to the context given.

^ In the grammaticality judgement task, sentence L3 was considered grammatical with the sign Q_{artichoke} ('why'), but not with the sign MOTIVO ('why').

G2	Partially grammatical		Grammatical	
G3	Grammatical**		Grammatical	
H1	Grammatical		Grammatical	
H2	Grammatical		Grammatical	
H3	Grammatical		Grammatical	
I1	Ungrammatical****		Grammatical	
I2	Ungrammatical****		Grammatical	
I3	Ungrammatical****		Grammatical	
J1	Grammatical		Grammatical	
J2	Grammatical		Grammatical	
J3	Grammatical		Grammatical	
K1	Grammatical		Grammatical	
K2	Grammatical		Grammatical	
K3	Partially grammatical		Grammatical**	
L1	Grammatical		Grammatical	
L2	Grammatical		Grammatical	
L3	Ungrammatical^		Ungrammatical	
L4	Partially grammatical		Grammatical	
L5	Grammatical		Grammatical	

Informant 04 ⁴				
	Grammaticality judgement task		Sentence repetition task	
	Given context	Other context	Given context	Other context
A1	Grammatical		Grammatical	
A2	Ungrammatical		Ungrammatical	
A3	Grammatical		Grammatical	
A4	Ungrammatical		Ungrammatical	
A5	Ungrammatical		Partially grammatical	
B1	Grammatical		Grammatical	
B2	Grammatical		Partially grammatical	
B3	Grammatical		Grammatical	
B4	Ungrammatical		Ungrammatical	
B5	Ungrammatical		Ungrammatical	
C1	Grammatical		Grammatical	
C2	Ungrammatical		Ungrammatical	
C3	Ungrammatical		Ungrammatical	
C4	Grammatical		Ungrammatical	
C5	Grammatical		Grammatical	
D1	Ungrammatical	Grammatical	Grammatical	
D2	Ungrammatical		Ungrammatical	
D3	Grammatical**		Grammatical	
E1	Partially grammatical	Grammatical	Grammatical	
E2	Ungrammatical		Partially grammatical	
E3	Grammatical**		Partially grammatical	
F1	Grammatical		Partially grammatical	Grammatical
F2	Ungrammatical		Ungrammatical	
F3	Grammatical		Grammatical	
G1	Grammatical		Partially grammatical	Grammatical
G2	Ungrammatical		Ungrammatical	
G3	Grammatical**		Grammatical	
H1	Grammatical		Grammatical	
H2	Ungrammatical		Grammatical	
H3	Grammatical		Partially grammatical	
I1	Ungrammatical		Grammatical	

⁴ ** These sentences are accepted, yet disliked.

*** These sentences are accepted, but preferred in other contexts.

I2	Grammatical		Grammatical	
I3	Ungrammatical		Grammatical	
J1	Grammatical		Ungrammatical	Grammatical
J2	Grammatical		Grammatical	
J3	Grammatical		Ungrammatical	Grammatical
K1	Grammatical***	Grammatical	Grammatical	
K2	Ungrammatical		Ungrammatical	
K3	Ungrammatical		Grammatical	
L1	Partially grammatical	Grammatical	Grammatical	
L2	Ungrammatical		Ungrammatical	
L3	Ungrammatical		Ungrammatical	
L4	Grammatical		Grammatical	
L5	Ungrammatical	Grammatical	Ungrammatical	Grammatical

Appendix E

Measurements tables

The following tables display mean signs durations and mean between-signs time measured for the collected and analyzed sentences, grouped for output sentence (e.g., A1, A2, and so forth), as reported in Chapter 3, to which the reader is referred for more details.

	A1	A2	A3
IX_{3P}	338 ms	329 ms	-
<i>time</i>	271 ms	227 ms	-
WORK	910 ms	382 ms	480 ms
<i>time</i>	-	173 ms	175 ms
IX_{3P}	-	380 ms	699 ms

	B1	B2	B3
IX_{3P}	296 ms	256 ms	-
<i>time</i>	216 ms	199 ms	-
WORK	880 ms	537 ms	346 ms
<i>time</i>	-	176 ms	184 ms
IX_{3P}	-	1084 ms	976 ms

	C1	C2	C3	C4	C5
IX_{3P}	291 ms	325 ms	-	307 ms	-
<i>time</i>	234 ms	233 ms	-	241 ms	-
WORK	458 ms	267 ms	658 ms	541 ms	384 ms
<i>time</i>	222 ms	181 ms	147 ms	203 ms	191 ms
IX_{3P}	-	-	-	214 ms	337 ms
<i>time</i>	-	-	-	207 ms	310 ms
WHEN	727 ms	186 ms	192 ms	1140 ms	876 ms
<i>time</i>	-	093 ms	273 ms	-	-
IX_{3P}	-	370 ms	1122 ms	-	-

	D1	D2	D3
YOUNG-GUY	443 ms	504 ms	439 ms
<i>time</i>	419 ms	508 ms	345 ms
NEWSPAPER	367 ms	316 ms	392 ms
<i>time</i>	294 ms	214 ms	273 ms
BUY	521 ms	264 ms	257 ms
<i>time</i>	-	206 ms	220 ms
IX_{subject}	-	282 ms	-
IX_{object}	-	-	592 ms

	E1	E2	E3
YOUNG-GUY	350 ms	361 ms	333 ms
<i>time</i>	197 ms	173 ms	168 ms
IX _{object}	271 ms	327 ms	264 ms
<i>time</i>	350 ms	407 ms	371 ms
BUY	526 ms	428 ms	313 ms
<i>time</i>	-	273 ms	187 ms
IX _{subject}	-	227 ms	-
IX _{object}	-	-	231 ms

	F1	F2	F3
IX ₃	264 ms	211 ms	195 ms
<i>time</i>	445 ms	272 ms	386 ms
NEWSPAPER	273 ms	377 ms	339 ms
<i>time</i>	268 ms	254 ms	272 ms
BUY	417 ms	293 ms	243 ms
<i>time</i>	-	279 ms	212 ms
IX _{subject}	-	322 ms	-
IX _{object}	-	-	397 ms

	G1	G2	G3
IX ₃	158 ms	194 ms	207 ms
<i>time</i>	261 ms	170 ms	185 ms
IX _{object}	197 ms	228 ms	186 ms
<i>time</i>	307 ms	338 ms	280 ms
BUY	444 ms	431 ms	193 ms
<i>time</i>	-	304 ms	187 ms
IX _{subject}	-	663 ms	-
IX _{object}	-	-	659 ms

	H1	H2	H3
YOUNG-GUY	475 ms	453 ms	429 ms
<i>time</i>	326 ms	364 ms	406 ms
NEWSPAPER	357 ms	351 ms	391 ms
<i>time</i>	251 ms	280 ms	194 ms
BUY	1020 ms	220 ms	206 ms
<i>time</i>	-	246 ms	160 ms
IX _{subject}	-	771 ms	-
IX _{object}	-	-	844 ms

	I1	I2	I3
YOUNG-GUY	495 ms	209 ms	377 ms
<i>time</i>	172 ms	193 ms	275 ms
IX _{object}	230 ms	207 ms	247 ms
<i>time</i>	304 ms	278 ms	274 ms
BUY	1140 ms	238 ms	203 ms
<i>time</i>	-	176 ms	188 ms
IX _{subject}	-	724 ms	-
IX _{object}	-	-	982 ms

	J1	J2	J3
IX _{subject}	201 ms	219 ms	238 ms
<i>time</i>	325 ms	271 ms	301 ms
NEWSPAPER	244 ms	238 ms	223 ms
<i>time</i>	269 ms	228 ms	216 ms
BUY	755 ms	193 ms	220 ms
<i>time</i>	-	264 ms	193 ms
IX _{subject}	-	640 ms	-
IX _{object}	-	-	998 ms

	K1	K2	K3
IX _{subject}	185 ms	128 ms	174 ms
<i>time</i>	324 ms	209 ms	231 ms
IX _{object}	194 ms	150 ms	150 ms
<i>time</i>	293 ms	248 ms	237 ms
BUY	729 ms	264 ms	171 ms
<i>time</i>	-	240 ms	198 ms
IX _{subject}	-	1180 ms	-
IX _{object}	-	-	882 ms

	L1	L2	L4	L5
YOUNG-GUY	342 ms	522 ms	317 ms	283 ms
<i>time</i>	305 ms	532 ms	320 ms	414 ms
NEWSPAPER	238 ms	133 ms	277 ms	225 ms
<i>time</i>	287 ms	315 ms	299 ms	313 ms
BUY	339 ms	256 ms	395 ms	231 ms
<i>time</i>	-	-	269 ms	137 ms
IX _{subject}	-	-	155 ms	-
IX _{object}	-	-	-	204 ms
<i>time</i>	249 ms	229 ms	263 ms	397 ms
WHEN	1014 ms	266 ms	894 ms	984 ms
<i>time</i>	-	248 ms	-	-
IX _{subject}	-	517 ms	-	-

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