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Tesi di Ricerca

Can you retrieve it?

Pragmatic, morpho-syntactic and prosodic features in sentence topic types in Italian Sign Language (LIS)

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Alle mie due Lie: passato e futuro,

a mio marito e a mio padre: fortissimo presente.

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"No man is an island entire of itself", wrote John Donne in his masterpiece, and I can add that no research is an island, rather it is the byproduct of many observations collected together. In the same way, this study is the syncretic result of people who have crossed my path over these three years, who have made possible the establishment day by day of this research, supporting, challenging and stimulating it.

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senza mai essere ombra, né parte complementare ma semplicemente se stesso. Qualcuno che lascia una straordinaria libertà di essere interamente e di realizzare profondamente ciò che si è. “*Hospes comesque*”.

La ricerca stessa è lo scopo,

il risultato ce ne priverebbe[1].

(Luci d'estate ed è subito notte - Stefánsson Jon Kalman)

[1] "The research itself is the purpose, the result would deprive us of it" (translation my own). *Summer Lights and Then Comes the Night- Stefánsson J.K*

Abstract

The present research uses a multi-theoretical approach to examine the prosodic realization and syntactic properties of three types of topic in LIS: aboutness topics, scene-setting topics and contrastive topics. The results show that both scene-setting and aboutness topics are accompanied by two prosodic cues, raised eyebrows and squinted eyes, and can be separated from the remaining part of the sentence by the prosodic boundary markers of eye blink and head nod. In addition, the marker of squinted eyes appears to bear a specific pragmatic function, signalling the supposed retrievability of the marked referent. A preliminary investigation of contrastive topics identifies both prosodic (the rightward and leftward displacement of the body) and syntactic strategies (the use of different loci in the signing space) for expressing contrast.

This seminal study on topicalization in LIS sheds light on the linguistic communicative strategies used by signers to manage old information in LIS which is encoded as nominal, pronominal, or null referential expressions. In line with the linguistic principle of quantity, the more accessible a referent is, the less linguistic materialneeded in order to retrieve it, and vice versa. LIS signers make specific linguistic choices depending on the degree of accessibility and on the informational status of referents which are kept salient or reintroduced into the discourse. The choice of nominal forms shows a statistically significant correlation with both the reintroduced status of a referent and the prosodic marker of squinted eyes. The results demonstrate the crucial role of syntax with respect to the prosodic and pragmatic aspects of communication.

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Chapter 2. Information structures and topicality

ANNOTATION CONVENTIONS

MMs

lengthening (lll)
dryness (dr)
amplitude (a)
speed (sp)

NMMs:

Eyes:
wide eyes (we)
eye blink (eb)
closed eyes (ce)
high glance (hg)
left eyes (le)
right eyes (re)
squinted eyes (sq)

Eyebrows:
Raised eyebrows (re)
furrowed eyebrows (fe)
neutral eyebrows (ne)

Mouth:
mouthing (m)
mouth gesture (mg)

Head:
head nod (hn)
head sake (hs)
head forward (hf)
head back (hb)

head tilt back (htb)

head left (hl)

head right (hr)

Body:

lean back (lb)

lean forward (lf)

lean left (ll)

lean right (lr)

Subject (s)

Verb (v)

Object (o)

Prepositional phrase (pp)

IX pointing sign generic

IX-1 pointing sign functioning as personal pronoun (first person)

IX-2 pointing sign functioning as personal pronoun (second person)

IX-3 pointing sign functioning as personal pronoun (third person)

IX-DEM pointing sign as demonstrative

IX-POSS pointing sign as possessive

IX-LOC pointing sign as locative

$\overline{\text{SIGN}}^{\text{sq}}$ non-manual marking

$\overline{\text{SIGN}}^{\text{abt}}$ type of topic

SIGN, SIGN prosodic pause

SIGN++ reduplicated sign

S-I-G-N- Fingerspelling

NEG negation

LIST OF ABBREVIATIONS

ASL American Sign Language
BSL British Sign Language
HKSL Hong Kong Sign Language
ISL Israel Sign Language
ISL2 Irish Sign Language
LIBRAS Brazilian Sign Language
LIS Italian Sign Language
LSC Catalan Sign Language
LSF French Sign Language
NGT Netherlands Sign Language
RST Russian Sign Language

Aboutness Topics (AbT)
Scene-setting Topics (SsT)
Contrastive Topics (CT)
Complementizer Phrase (CP)
Determiner Phrase (DP)
Nominal Phrase (NP)
Pronoun (pro)
Non-manual marker (NMM)
Manual marker (MM)

General Introduction

Sign languages are complex, fully-fledged systems which use visual-gestural modality, unlike spoken languages, which are conveyed through verbal-acoustic modality. Nonetheless, studies in theoretical linguistics have proven that both modalities display common properties and phenomena, enhancing the claim for the existence of a universal system of linguistic properties which reflect the capacities of human communication.

Linguistics studies on sign languages started in the 1960s (Stokoe, 1960), and, year by year, research into their phonology, morphology, lexicon, syntax and pragmatics has increased alongside academic interest in these languages.

In Italy, LIS began to be investigated in the early 1980s thanks to the pioneering research conducted by the CNR (National Research Council) based in Rome (Volterra 1987, Corazza & Volterra 2007; Verdirosi 2004; Radutzsky and Santarelli 2004, Franchi 2004, a.o.). After the year 2000, studies within the generative grammar theoretical framework commenced in line with similar studies abroad.

The current study concerns topicality, namely the established or given information shared among those people participating in a conversation. Topicality cannot be considered a unitary notion, rather it is a series of interrelated phenomena whose common function is to establish the presupposed part of the sentence.

For this reason, the notion of topicality was assumed as a principle around which discourse is structured, when in fact natural conversation are assumed to add new information upon the old or the given one.

Cross-linguistically, shared information is supposed to be prosodically and syntactically encoded with specific linguistic strategies. However, such strategies may vary depending on the language's modality and thus require further investigations. Indeed, despite the large number of studies on verbal-acoustic modality, studies into languages with visual-gestural modality, such as LIS, still display few comprehensive analyses on topic types.

This is one of the reasons which leads me to investigate this phenomenon in LIS; the second reason relates to the fascinating way that this type of linguistic phenomenon affects multiple linguistic levels, such as the prosodic, the syntactic and the pragmatic level.

Similarly to other languages that share visual-gestural modality, LIS makes use of the signing space in order to convey grammatical information such as morphological agreements, inflection, and anaphoric relations. Such grammaticalization is possible because the signer selects a specific *locus* of the signing space which temporarily hosts the realization of an entity.

These language-specific characteristics affect the management of topic information among the participants in a conversation, namely, the way in which the old and shared part of the information is handled. Topicality in sign languages can therefore be conveyed through linguistic strategies which are modality-specific. The investigation of such strategies is interesting from a cross-linguistic perspective, since it permits an analysis of the way in which speakers/signers adapt their linguistic systems to structure information within their discourse.

In the case of anaphoric relations, for example, these language-specific strategies allow references to be traced, and enable the linking of pronouns or other anaphoric elements to the previously mentioned constituents to which they refer.

To take the analysis a step further, the phenomena related to topicality are divisible into sub-categories and may be addressed by taking into consideration a multi-theoretical approach.

So far, few studies have been conducted on topicality in LIS (Brunelli 2007, 2009, 2011, Branchini 2014) and no specific investigation exists which offers a comprehensive overview of its pragmatic, syntactic and prosodic properties.

The following dissertation is therefore intended as a linguistic investigation into topichood and interrelated sub-phenomena in LIS.

Chapter 1 provides an outline of the main theoretical framework which has been considered and integrated in the present research. A multifaceted lens is required in order to appropriately address the complex topic phenomena . In this vein, generative linguistic approaches are considered together with pragmatic, functional and cognitive studies, which have previously analysed topicality from several points of view and have contributed to the creation of a more detailed picture of this phenomenon.
Chapter 2 focuses on the concept of topichood addressed in previous studies on spoken and sign languages, yielding a huge number of tag stratifications and labels. The presence of this terminological outpouring has made it difficult to create clear topic definitions. A detailed distinction between aboutness, scene-setting and contrastive topics is provided with respect to their prosodic, syntactic and pragmatic aspects. The studies on each type of topic follow the order of these sub-fields. A final overview about

the way in which the referential system works is then provided for both spoken and signed languages.
Chapter 3 outlines the research questions, hypotheses and predictions advanced in this study, also addressing the methodological issues. Particular attention is paid to informants, types of datasets, identification criteria and the analysis of results.
The linguistic contexts and the extra-linguistic conditions which pertain to topicality have led me to base the analyses on spontaneous discourses, in order to recreate natural conversational exchanges. In contrast, elicitation tasks fulfil the function of testing specific linguistic phenomena which would hardly be found in spontaneous conversations.
Since I decided to distinguish internally between prosodic, syntactic and pragmatic phenomena, the same order is reflected in the presentation of my findings. This choice should not be considered as a fixed structure; rather, it represents a way of explaining these interrelated phenomena.

Chapter 4 presents my findings concerning aboutness, scene-setting and contrastive topics in terms of prosodic markers, which spread over topic items and separate them from the remaining part of the sentence. Prosodic features are also analysed with respect to the syntactic realization of the sentential topic types. Moreover, a comparison between spontaneous and elicited sentences is provided.
Chapter 5 focuses on the syntactic aspects of topicality, with particular attention to the structure of aboutness topics. The syntactical realization of sentential topics is described in detail, and a test for validating the syntactic moved or base-generated nature of aboutness topics is employed. Finally, the hierarchical distribution of these elements within the sentence is addressed, in order to provide an initial insight into the syntactic distributions that hold true in LIS.
Finally, Chapter 6 considers the pragmatic properties of aboutness topic types by interpreting the function of referential expressions that these elements convey. The study of referentiality in LIS addresses the way in which communicative exchanges proceed among signers, with a specific focus on the syntactic choices of signers which are made in terms of informational status and accessibility of the referents. After this investigation, a first comprehensive referential hierarchy is sketched by considering the weight of information that referential forms express in LIS. Moreover, the use of prosodic strategies is considered with specific pragmatic functions.

The conclusions close the study, together with some of the tests employed and a better description of the statistical analyses carried out in the Appendix.

CHAPTER 1
The Theoretical Framework

1.1 Introduction

The current chapter conveys selected information about the linguistic frameworks which have been functional for the present investigation, and in particular takes into consideration the perspectives of the Generative, Pragmatic, Functional-Typological and Cognitive studies on topicality. All these approaches are useful for a multi-perspective analysis of such a complex and elusive linguistic phenomenonas topichood.

The adoption of an interdisciplinary lens also permits easier detection of topicality by considering a widespread range of theories, covering the different overlapping spheres of human language and knowledge. Indeed, a multi-theoretical approach enables independent processes to interact with each other, exploring new pathways of analysis and providing important insights to better address spoken and signed language phenomena. Such a multi-perspective view is also encouraged by modern linguistic tendencies which combine knowledge from different theoretical backgrounds in order to explore different linguistically-borderline elements at the same time. For the purpose of this research several studies are taken into consideration, some of which originate in opposing frameworks such as generativism, cognitivism or the functional-typological approach. The objective is not to combine these different theoretical models, but rather to take advantage of the studies carried out so far to offer a broader analysis of topicality in Italian Sign Language.[2]

Generativism provides a theoretical syntactic structure which accounts for linguistic phenomena by providing a scientific method of analysis. Through this lens phonological and morpho-syntactical aspects of sentence topic types are addressed: in particular the manual and non-manual components which accompany the realization of aboutness topics, scene-setting topics and contrastive topics. A further level of analysis is conducted by investigating their order when all three topic types appear within the same sentence. Within this framework, topics are further investigated from a formal perspective by exploring their syntactic nature and position, namely their status as moved or base-generated constituents in the left or right periphery of the sentence.

[2] This multi-theoretical approach should be intended as an enrichment of a methodology still developed within the linguistic domain, and not as a mixture of disciplines.

The Pragmatic approach, on the other hand, permits the study of the topic phenomenon by considering the contextual usage of language, also defined as language performance. As pragmatics is a wide and multifaceted field, this section intends to circumscribe it, by defining the sense in which pragmatics is interpreted in the present study. Particular attention is devoted to those pragmatic studies investigating how information is packaged and conveyed between interlocutors in a specific context. The pragmatic lens also contributes to the understanding of how the linguistic choices of signers may vary across different types of data.

Amid the generative assumptions about the competence of language and the pragmatic interest in the performance of language, there are functional-typological studies. Indeed, they are close to generative assumptions and face similar issues, but functional-typological theories adopt a bottom-up approach in order to find cross-linguistic universals, that is an empirical scientific approach. On the other hand, similarly to pragmatic studies, functional typological theories pay particular attention to the communicative and social features which characterize language. Indeed, attention to discourse, pragmatic, sociolinguistic and cultural elements in linguistic analysis extends the investigation into topicality by considering a broader interpretative insight. Many functional and typological scholars, such as Halliday (1976), Givòn (1976, 1983a, 1983b, 1990, 2016), Li and Thompson (1976) investigated topicality. Their studies particularly focused on the communicative transactions between the speaker and the hearer, according to the two basic typological assumptions of economy and iconicity which function as cross-linguistic patterns. The notion of Emergent Grammar is also intrinsic to the current study: indeed, such a notion considers linguistic forms as modular products which function between the previous mentions of their forms and their modification in terms of the assessments of context and interlocutor. This concept will be crucial in later investigations.

Finally, cognitive studies - with their attention to cognitive processes and schemas - have turned out to be useful tools for investigating the ways in which information is managed in a discourse, especially considering the reintroduction or maintenance of old information. Therefore, for the purpose of the current research, cognitive linguistic studies contribute an additional lens by providing a range of new perspectives about the communication process within face-to-face interactions between speakers and addressees. Closely related to this model are, for example, the concepts of accessibility (Ariel 1990) and retrievability of shared information, together with the referential hierarchy (Gundel 1985, 2003, 2016), which states a range between the linguistic realization of a referent and the accessibility of the level of information that the speaker attributes to the addressee.

§ 1.2, § 1.3, § 1.4 and § 1.5 offer a brief overview of these macro-approaches: it is relevant to highlight that these macro-theoretical frameworks can be further broken down into numerous sub-approaches and connected theories. The intention here is not to provide a complete review of all the studies carried out in these fields over the years, but rather to select crucial information to set the theoretical background on which the present research is built.

1.2 Generative Linguistics

The present section is intended as a brief guideline for the generative theoretical framework. The intention is not to offer an exhaustive study of the theories developed in the field of topichood, but rather to offer an orientation tool where relevant theories will be selected in order to better contextualize the current study and its implications. In order to fulfil this aim, the origins and first conceptualization of the generative theory are presented in section 1.2.1, the historical evolutions of Generativism are laid out in 1.2.2, with a focus on Trasformational Grammar and Binding Theory in 1.2.2.1, a consideration of the Minimalist Program in 1.2.2.2 and a brief presentation of the relevant theories of cartographic research in 1.2.2.3. Finally, in 1.2.3 the relationship between generative studies and topichood is discussed.

1.2.1 Origins and first conceptualizations of Generativism

The discussion of languages and words has been a part of human history since at least the time of the ancient Greek philosophers, such as Gorgias and Plato, but only in the last two centuries has language started to be conceived of and studied as a scientific object, as opposed to a purely philosophical concern.

One of the most influential impacts of this development of linguistic may be seen in the theoretical work of De Saussure (1857-1913), whose basic notions of thought were conveyed in structural linguistic theory. According to his model, language is conceived as a system of signs which express ideas. Linguistic elements such as signs are correlated and defined by their own relationships within the system. In such systems, signs are related both to a signifier (the formal shape of a linguistic sign) and signified (the conceptual meaning of a sign) and the connection between these two layers is arbitrary; for example, the word ‘house’ below respectively involves the signifier, namely the formal representation of the term H-O-U-S-E and the signified, namely the semantic concept related to the mental notion of a house.

One of the main Saussurian contributions to structuralism concerns the two-tiered model which splits language into *langue* and *parole*; the first concept refers to the abstract layer of systematic rules and conventions of a linguistic system. By contrast, the second concept refers to concrete and individual uses of a language.

Challenging the previous structural approach, from the late 1950s Chomsky elaborated a ground-breaking theory of grammar. He conceived of languages as a uniform package encompassing all of the grammatical levels relying upon the domain of syntax. Furthermore, he formulated a theory of language by assuming logical and scientific paradigms which had generally been reserved for the natural sciences. Thanks to his innovative ideas, Chomsky is considered the father of modern linguistics, and one of the main founders of the *cognitive revolution*.

The new Chomskyan insight into grammar as a scientific theory of language allowed him to retrieve the dualistic distinction between *langue* and *parole*, by redefining the syntactic relation as the centre of the *langue* and by analysing it in terms of the scientific object of formal linguistics. Moving away from the Saussurian theorization, *langue* is defined by Chomsky as Language (with capital 'L') or as the linguistic competence which refers to a cognitive property of human beings, and concerns the ability to acquire, implement and use complex systems of communication, while language (with a lower case 'l') specifically applies to the performance of users and to the concrete instantiation of abstract linguistic competence. The object of generative studies is Language, namely the abstract and universal properties of languages.

> "We should be concerned to abstract from successful grammars and successful theories those more general properties that account for their success, and to develop [universal grammar] as a theory of these abstract properties, which might be realized in a variety of different ways. To choose among such realizations, it will be necessary to move to a much broader domain of evidence. What linguistics should try to provide is an abstract characterization of particular and universal grammar that serve as a guide and framework for this more general inquiry".
>
> Chomsky, 1981: 2

The central notion of generative theories relies upon the structure of such universal grammar, namely syntax. This syntax-centred conception of grammar explains one of the most distinctive properties of human language: linguistic creativity.

By moving away from a biological view of language, Chomsky supported a nativist approach to linguistic acquisition, which consideredthe structure of language as biologically determined in the human mind. Indeed, while observing the acquisition process of language, he noted the huge gap between the small amount of linguistic stimuli to which children are exposed and the complex and infinite combinations of linguistic structures that children are able to produce. Furthermore, by comparing the lack of this ability in animals, he postulated the existence of a genetic linguistic device devoted to the acquisition of language (Language Acquisition Device) in the human brain.

According to this model, language acquisition is theorized as a human ability which is genetically transmitted. Therefore, the assumption is that all humans share a similar linguistic structure, layered beneath cross-linguistic specificities. Such reflections led him to reject behaviourist theories, which present the mind as a *tabula rasa* where language is treated as a cultural product of the environment.

Theories of the generative linguistic system assume that the mind, like a computer, can generate sentences according to an unconscious set of procedures. These are partially a consequence of our genetic ability (Principles) and partially modelled by cross-linguistic specificities (Parameters). The main purpose of generative grammar is to point out these procedures, by mapping the underlying structure of Universal Grammar (UG) through a set of formal grammatical rules.

> "The pure study of language, based solely on evidence of the sort reviewed here, can carry us only to the understanding of abstract conditions on grammatical systems. No particular realization of these conditions has any privileged status. From a more abstract point of view, if it can be attained, we may see in retrospect that we moved towards the understanding of the abstract general conditions on linguistic structures by the detailed investigation of one or another 'concrete' realization: for example, transformational grammar, a particular instance of a system with these general properties. The abstract condition may relate to transformational grammar rather in the way that modern algebra relates to the number system".
>
> Chomsky, 1977, p. 207

By observing the way in which the human mind produces sentences, some distinctive properties of a universal linguistic structure arise: one of these universals is the multiple and potentially unlimited recursion in embedding syntactic structures. As in the following example (1a), (1b), (1c), (1d):

(1)

a. The president is incompetent.
b. A journalist states that the president is incompetent.
c. Today the television claims that a journalist states that the president is incompetent.
d. My granny said that today the television claims that a journalist states that the president is incompetent.

The different developments of the Chomskyan theories are grouped and identified under the general label of Generative Grammar. They consist of the implementation of Transformational Grammar (TG), which was further elaborated in Transformational Generative Grammar (TGG), Standard Theory (ST), Extended Standard Theory (EST), Revised Extended Standard Theory (REST), Government and Binding Theory (GB), Principles & Parameters Theory (P&P), and the Minimalist Program (MP). Many scholars contributed to improving the generative theories; some of these theories are diachronically discussed in the next session, with a major focus on the basic evolution of TGG, the P&P approach and the MP.

1.2.2 Evolutions of the main Generative Theories

To provide an overly detailed description of the linear progressive evolution of the generative theories could result in a problematic attempt to summarise a process which was not in fact uniform, and run the risk of getting caught up in artificial biases. On the other hand, to give an overly simplified description of the complex and interwoven story of the evolution of generative theories might result in too great a simplification. Therefore, the next section is an attempt to outline the relevant evolution in the multidirectional and still ongoing processes of linguistic and theoretical reflections about universal grammar. Such an overview is necessary to comprehend the analysis which will be carried out in the following chapters.

Since Chomsky's first theories, a cyclic process took place leading syntacticians to consider grammar through a rules-oriented or a principles-oriented lens. As noted by

Newmeyer (1995), each one of these phases, however, represented a step forward in the understanding of the nature of syntactic processes.

1.2.2.1 From Transformational Grammar to Government and Binding Theory (GB)

Transformational Grammar (TG) and Transformational Generative Grammar (TGG) were developed by Chomsky (1965) and inspired by Zallig Harris. Their theories revolve around a dualistic representation of language, where syntax has two levels of analysis: a deep structure and a surface structure. This conception comes from the observation of particular sentence structures which display syntactic manipulation, such as active voice sentences compared to passive voice sentences (examples (2a) and (2b)) or statements compared to questions (examples (2c) and (2d)).

(2)

a. John eats a fish.
b. A fish is eaten by John.
c. You have eaten chocolate.
d. Have you eaten chocolate?

According to this theory, the semantic relations of a sentence are represented by the deep structure, while the phonological realization appears in the surface structure and is manipulated by defined operations also described as transformations. Transformational grammar involves two types of rules: the first are phrase structure rules, which describe a natural language in terms of its constituents or syntactic categories; the second are transformational rules which act on the structure of the sentence in order to produce other sets of grammatically correct sentences.
Under this framework, the transformational rules fulfil the function of economising the rules necessary for generating grammatical sentences in a language.
At this stage, although the theory is rules-oriented, it already contains two important principles of the UG: the principle of cyclic application of transformational rules, and the separation of category-introducing rules from those of subcategorization.

Between 1965 and 1973, Chomsky improved the transformational grammar theories in his Extended Standard Theory (EST). The main innovations were the postulation of syntactic constraints and the generalized phrase structure, also known as X-bar theory (Chomsky, 1970). This X-bar scheme, which was central to the evolution of the theoretical framework, at least until the Minimalist Program, was further developed by

Chomsky in the Revised Extended Standard Theory (REST) from 1973 onwards, and subsequently refined by Jackendoff (1977).

The following headings present the theory in further detail by focusing on its crucial aspects.

X-bar Theory

The generative framework theory assumes that all the syntactic structures licensed by grammar follow the same binary (Kayne, 1984) and recursive pattern, namely the X-bar schema, where X is a variable representing both lexical and functional categories. The X-bar schema allows for the structuring of all linguistic elements according to the same syntactic pattern, which reflects the Uniformity condition.

The X-bar pattern consists of sets of nodes related by branches. Among the nodes, it is possible to distinguish between terminal nodes, which generally contain lexical items, and non-terminal nodes labelled with syntactic categories. According to the strict version of the X-bar theory, endocentricity is assumed, namely the structure turns around a centre, called the head. Such patterns can be recursively repeated in order to create bigger structures based on head-projection configurations. The head represents the centre of this model and projects its category to the upper levels of the format. For this reason, the head is also called the zero projection. The projected categories are marked by one (X') or more primes and are called bars. They fulfil the function of signalling the intermediate projection level. The last projection is defined as maximal (XP), as shown in Figure 1. below.

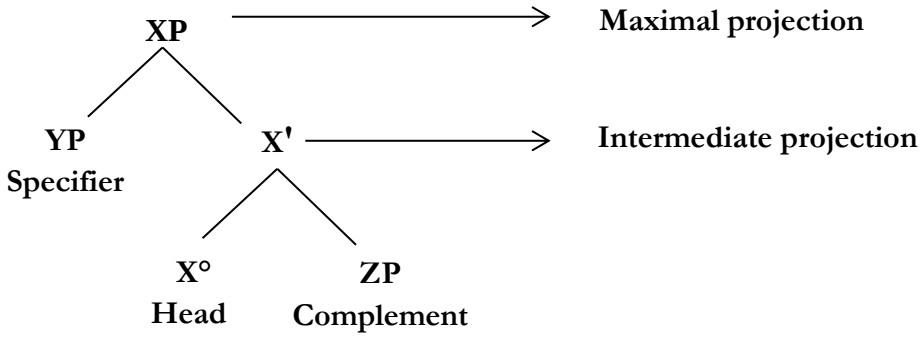


Figure 1. Phrase structure

In a tree generated by this model, the top node is considered the mother, and the binary branches generated are considered sisters. The sister of the head is called the complement and it might be the maximal projection of another phrase. The sister of the intermediate projection (X') is named the specifier.

As mentioned before, such structures in the first account only pertain to lexical categories.
Figures 2 and 3 show examples of lexical categories, such as the Noun Phrase (NP) “dog” and the Verb Phrase (VP) “eat”.

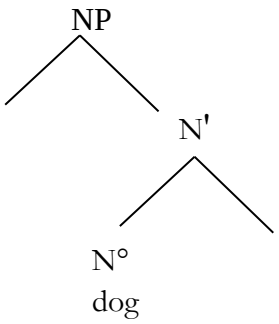


Figure 2. Noun Phrase structure

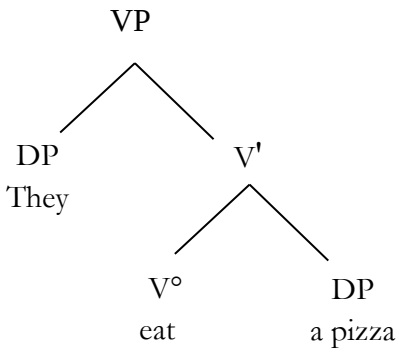


Figure 3. Verb Phrase Structure

Later, the model was extended to functional categories (Chomsky 1986), dominating lexical phrases, such as the Inflectional (I), which bears the inflectional properties of the verb, like tense, agreement and person, and the Complementizer (C), which deals with the definition of the force of the clause, such as the interrogative or indicative interpretation.

In so doing, the functional categories considered by the model create three layers of analysis: the Verb Phrase (VP), which is the core centre of the structure, the Inflectional Phrase (IP), which is taken to be projected above the VP, and the Complementizer Phrase (CP) which is projected above the IP, as shown in Figure 4 below.

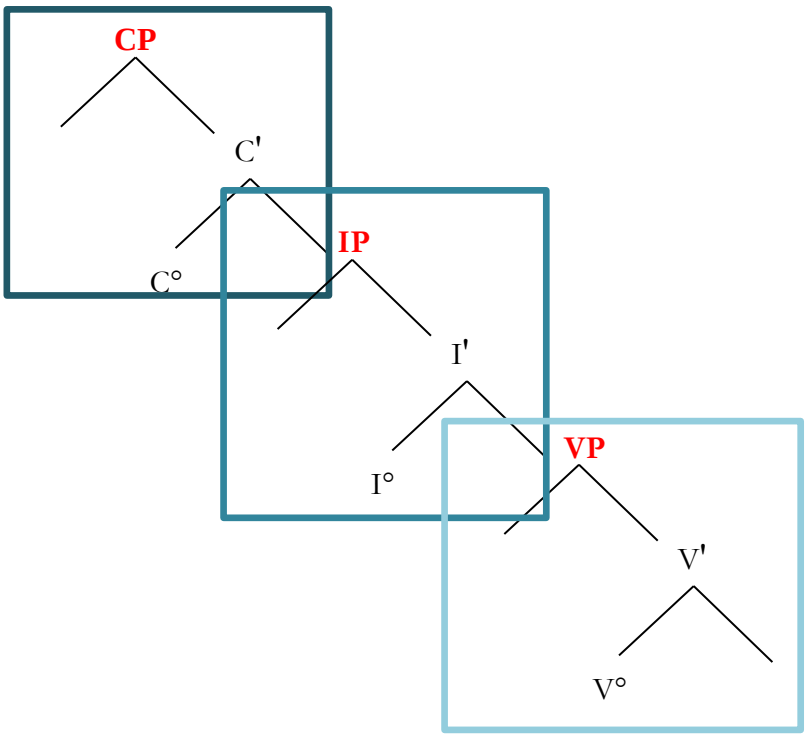


Figure 4. The syntactic structure of Functional Categories

Evolutions in the X-bar theory have been developed by Abney (1987) who suggested the extension of such a model to the functional domain of the Determiner Phrase (DP) projected above the Nominal Phrase (NP). Further studies have proposed a more fine-graded analysis of the structure, by splitting the functional domain into other projections. Pollock's (1989) study splits IP into two more projections: the Tense Phrase (TP) responsible for tense marking and the Agreement Phrase (AgrP) responsible for subject agreement. In the same vein, Rizzi (1997) postulates the Split of CP (see further details of this discussion in §1.1.5).

Kayne (1994) further refined the model by reducing its flexible order to a universal fixed one based on the notion of precedence. According to his account, the Specifier always precedes the Head which, in turn, precedes the Complement. In Kayne's proposal, syntactic movements are responsible for other possible orders observed in natural languages. An important consequence of his theory is that syntactic movement must always be leftward and must raise the structure. Kayne's proposal is not going to be further discussed here, since his theory is not functional to the current dissertation.

An important step forward in the development of the theories within the generative approach is represented by the Government and Binding Theory (GB), formulated between 1981 and 1990. This work unifies, within a homogeneous and elegant

framework, a great deal of previously disparate grammatical phenomena: the government and binding principle subsumes many of the precedent rules and filters into a single model.

The conception of Language used in the generative studies can be schematized into a model, known as the T model or Y model and displayed in Figure (5) below.

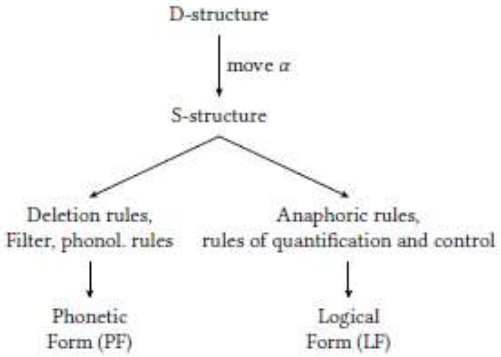


Figure 5. The T Model

(Müller 2018:88)

According to this model, "the syntactic components of the grammar generate an infinite set of abstract structures –called S-structures- that are assigned a representation in PF (Phonetic Form) and in LF (Logic Form)" (Chomsky, 1981: 4).

The term 'Lexicon' specifies the abstract morpho-phonological structure of single lexical items together with their syntactic properties, such as nouns, predicates, determiners, one-place predicates or two-place predicates. Therefore, both lexicon and syntax are the base of this formal theory. The insertions of lexical items into structures generated by syntax appear in the D-structure, and are subsequently mapped to the S-structure by movement rules, which represent the transformational components of the generative grammar.

Starting from the REST (Revised Extended Standard Theory), the introduction of important movement rules is displayed, further elaborated in the Government and Binding Theory (GB), and known as Move α. Under this framework, the term refers to a single universal rule - 'Move anything anywhere!' - and contains all the specific rules for movement. These changes in the GB theory signal a focus shift from a specific rules-oriented approach to a principles-oriented perspective.

Move α refers to a different conceptualization of syntactic manipulation, focusing on the relationship between the landing site of a moved constituent and its previous position.

According to this theory, syntactic movement leaves a trace in the original position of the syntactic structure from which the element moves. As in the example below, where the movement of the constituent *who* is signalled by a co-indexed trace (t_i):

(3) *Who*$_i$ does John thinks is running t_i ?

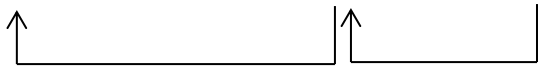
A trace is classified as a particular type of empty category, namely a null position that is left in the extraction site after a syntactic movement.

The conditions where the application of such movement principles hold are further analysed in the GB framework. The improvements led to the postulation of some restrictions on certain transformational processes, due to specific barrier effects created by locality conditions. This theory is known as bounding theory and it deals with linguistic constraints on wh-movement. Such constraints are captured by the subjacency principle of bounding theory. Since the theory is relevant to the current research, it is presented below in further detail.

The subjacency principle claims that wh-expressions cannot cross more than one bounding-node (Chomsky 1973, 1977) at the same time. Bounding nodes are clause boundaries or nominal phrase boundaries, as in example (4a), where *how* is extracted from the embedded clause, but it moves cyclically and crosses only one boundary node at a time.[3]

(4)

(a) [$_{CP}$ What do [$_{IP}$ you think [$_{CP}$ t_i [$_{IP}$ Mary loves t_i]?



By contrast, in example (4b) with the second movement (highlighted with the red arrow) *what* crosses more than one boundary node at a time. Therefore, the sentence clashes, because the subjacency condition is violated.

(b) *[$_{CP}$ What$_i$ did [$_{TP}$ the policeman make [$_{NP}$ the claim [$_{CP}$ t_i that [$_{TP}$ the thief had robbed t_i]?

[3] According to the theory, only nodes that dominate wh-words count.

Furthermore, according to the postulations of GB, the trace presents a bounding relation with the moved constituent.

In order to better understand these bounding relations, let's briefly analyse some principles upon which the system relies: (i) government theory, (ii) case-theory, (iii) Θ -theory, (iv) binding theory and (v) control theory.

Government Theory

Government is focused on the central idea of the influential relationship between the head of a structure and the categories which depend on it. Specifically, it is an abstract syntactic relationship applicable to the assignment of case.[4] Thanks to government relations, case is unambiguously assigned. A well-known case-assignment situation ruled by the government theory is the nominal case assigned by the tense of the verb (in IP), exemplified in Figure (6) below.

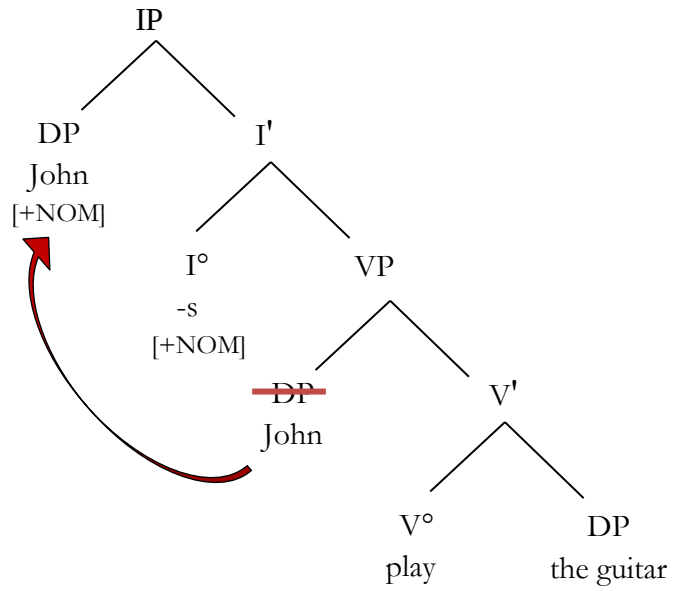


Figure 6. Assignement of the Nominal Case.

Case Theory

According to the Case Filter, all the DPs in the structure must be assigned a case. Since the nominative case is assigned by the tense of a verb, the subject of the sentence is forced to rise from its original position (in the Specifier of VP) to the Specifier of IP, in order to receive the nominative case.

Θ-theory

[4] Case is a linguistic category which applies to lexical words and reflects the grammatical function fulfilled by the morphological properties of this word within the syntactic structure, such as subjective/nominative, objective/accusative, possessive, genitive (…) case.

Unlike case, thematic relations pertain to the semantic roles that a noun phrase may convey with respect to the action or state described by a particular verb in a certain structure, such as the agent or the patient. In the generative framework such relationships are indicated as theta-roles (θ-roles). According to the theta-criterion, each argument can bear only one θ-role and each θ-role must be assigned to only one argument.

Binding Theory

Despite the fact that this theory is still debated among scholars, it is briefly discussed in the following pages because it is relevant to some investigations that I will deal with in the following chapters. The Binding theory concerns referential relationships between anaphors (in the generative framework these are reflexive expressions, such as himself or herself), pronouns, names and other variables related to a certain antecedent. The theory accounts for the different syntactic distributions of these linguistic expressions in the sentence by means of co-indexation. Each index represents a co-referential relationship between two expressions. For example in sentence (5a) below, the anaphor (*himself*) is co-indexed with its antecedent John. Conversely in sentence (5b) *herself* can only be co-indexed with *Susan*; if co-indexed with *Mary*, it would lead to ungrammaticality.

(5)

(a) $John_i$ loves $himself_i$.
(b) *$Mary_i$ asked Susan to wash $herself_i$

According to the binding theory, it is possible to account for the syntactic specificities that anaphors, pronouns and referential expressions bring with them.

In the case of anaphors, the two examples above show that anaphoric expressions must have a local antecedent. According to the example below, however, this condition is not enough. In example (6) below, the anaphoric expression *himself* can have as antecedent a noun phrase which represents the subject of the sentence, but cannot have as antecedent a noun phrase within the structure of the NP subject (*John*).

(6) $John_i$'s $father_k$ loves $himself_{i*/k}$.

Himself can only be co-indexed with the father of John, otherwise the sentence would lead to an ungrammatical interpretation. In the case of anaphors, then, binding relationships require not only an anaphoric expression and a local antecedent, but also the notion of c-command. This is known as condition A of the binding theory. C-

command[5] is a relationship based on the notion of dominance between nodes of a syntactic tree. The notion of C-command became central under the Minimalist approach.

In the case of pronominal elements, their distribution becomes complementary, that is opposite to the behaviour of anaphors. Contrary to anaphors, pronouns must be free in their local domain, so they can have an antecedent as long as it is not local and it does not c-command the pronominal expression. This is demonstrated in the example (7) below:

(7) Mary_i asked Susan_k to wash $\text{her}_{i/*k}$

In (7), only *Mary* (and not Susan) can be the antecedent of the personal pronoun *her*, because it is outside the local domain, namely, the minimal clause in which the pronoun *her* is contained. The c-command domain is only relevant in the local domain, therefore it does not have any influence on the relationship between the pronominal expressions and their antecedent. This is called Condition B of the binding theory.

As for referring expressions (R-expressions), common nouns or proper names, the binding theory condition states that they must not be c-commanded by their antecedent. The sentences (8a) and (8b) below are ungrammatical because the referring expressions (*Mary* and *father*) are c-commanded by their antecedents (*she* and *he*).

(8)

(a) $*\text{She}_i$ asked Susan to wash Mary_i
(b) $*\text{He}_i$ asked Susan to wash the father_i

The condition governing the binding relations of R-expressions is known as Condition C of the binding theory.

Control Theory

The Control theory deals with the linguistic conditions licensing the abstract pronominal element PRO. Such elements are pronominal DPs able to carry null case. PRO differs from pro (lower case pro), which represents the silent counterpart of an overt pronoun, and it also differs from a trace which is left by the movement of an element to a different position in the structure. In the examples in (9) below, these differences are exemplified:

[5] The notion of C-command is partially based on the notion of dominance, it requires that a certain node (A) c-commands node B if, and only if, (i) A does not dominate B, (ii) B does not dominate A, and the lowest branching node which dominates A also dominates B.

(9)

(a) John$_i$ seems t_i to win.
(b) John$_i$ expects PRO$_i$ to win.

Although apparently these sentences seem to share the same structures, a deeper analysis reveals that in (9a) *John* is not the agent of the verb *seem*, indeed *John* does not receive any theta role from the matrix verb *seem*, rather it receives the theta role from the verb *win*. Actually a structure equivalent to (9a) could be *It seems that John wins*. This phenomenon is known as Subject Raising, a by-product of the movement of the Subject from the lower structure in the first IP to the higher IP. On the contrary, in example (9b) *John* is thematically related to both the matrix verb *expect* and the embedded predicate *win*. The sentence should appear as a case of theta criterion violation, but the violation does not occur by postulating the existence of such a null pronoun PRO. This linguistic phenomenon is defined as Subject Control because the subject (*John*) controls the null pronoun PRO in the uninflected clause.

Similar related phenomena postulating the existence of PRO are displayed in the examples (10) below:

(10)

(a) John imagines his mother$_i$ t_i to have met her girlfriend.
(b) John urged his mother$_i$ PRO$_i$ to meet his girlfriend.

Sentence (10a) is an Object-Raising structure, namely the post-verbal argument *his mother* is the agent of the verb *meet* in the embedded clause, and the matrix verb *imagines* assigns the agent role to the subject John and the theme role to the clausal complement *his mother*. On the contrary, the sentence in (10b) is an Object Control structure: the post-verbal argument *his mother* has a double function: it is the object of the matrix clause *urged* and the agent of the embedded verb *to meet.*

By observing the properties of sentences like those in (10), Chomsky postulated the existence of an empty category PRO, in order to satisfy the theta criterion and the Extended Projection Principle.[6] PRO is null and silent because it is in a caseless position; indeed it appears in the position of the Specifier of a non-finite clause. Moreover, PRO is a base-generated element because it is not the residual trace of a movement operation. According to the postulations, PRO has a double nature, both as a pronominal element and as an anaphoric element [+pronominal; +anaphoric] depending on the (non)-obligatory conditions of control. In cases of obligatory control, PRO

[6] The EPP (Extended Projection Principle) states that each sentence must contain a noun phrase or a determiner phrase placed in subject position (Chomsky, 1982).

behaves like an anaphoric element under the specific requirements for anaphor-antecedent relationships stated by the binding theory, namely PRO is bound by an antecedent that controls it. In cases of non-obligatory conditions of control, PRO behaves like a pronoun subject to the specific properties required for pronouns in the binding theory, that is it should be free in its governing categories. However according to the PRO Theorem, PRO does not have a governor and it always appears in ungoverned positions. According to the Minimalist approach, such an account was further revised by Hornstein (1999), who tried to establish a correlation between the obligatory controlled PRO and a moved NP trace, by defining a new hybrid model.

Leaving aside the specific linguistic discussions and going back to the generative model, it is noticeable that each part of this grammatical system is correlated and is based on abstract principles and on certain language-specific parameters, according to the Principle and Parameters Theory (Chomsky, 1981). In a complex system where subparts are strictly interrelated, a small change in a parameter setting could have consequences for various parts of the grammar. Therefore, the goals of this model are also to group sets of properties by relating similar languages to single fixed parameters. The risk, however, is the creation of ad-hoc theories for variations connected to a specific language. The generative model is later radically redefined by the Minimalist Program, which changes some fundamental aspects of the previous approach. The notion of transformation (amonst others), still holding until the Government and Binding theory, is not accepted under the Minimalist framework.

1.2.2.2 The Minimalist Program

The Minimalism Program (MP) is proposed as an ongoing inquiry characterized by a more flexible and multidirectional approach, "eliminating stipulations, redundancy, and other complications" (Chomsky 2015: 9). The MP is still focused on the notion of I-language, where *I* refers to the Internal, Individual and Intentional language. Although anchored to the base notion of the P&P model and with the assumption of a language faculty system which interacts with other systems, the MP further develops the notion of simplicity, subsumed into two basic principles: (i) the economy of derivation and (ii) the economy of representation. The former concerns the necessary requirement in order for

movement to occur; this requirement matches the interpretable[7] features with the uninterpretable[8] features.
The latter principle, the economy of representation, concerns the motivated existence of a syntactic structure. In particular, it postulates that a structure should be explicable by the simplest possible formulation within the framework under consideration.

Among the various innovations proposed by the minimalist framework, some of the most significant ones concern the modification of the X-bar schema into Bare Phrase Structure (BPS), the *reductio ad unum* of the double model containing both the deep and surface structures, the elimination of the concept of government in place of the central notion of c-command, and the idea that syntactic derivation proceeds by phases, namely defined stages.

The innovation of the BPS is focused on the fact that the structure becomes explicitly derivational, namely it is built from the bottom up by merging two syntactic elements. Furthermore, it must be binary and lacks a preconceived phrasal structure such as a Specifier, Head or Complement in each phrase (unlike previous X-bar theory postulations). Within the Bare Phrase Structure, the addition of two operations is a key development: these two operations are Merge and Move.
Merge is a mechanism which combines two constituents by creating a third constituent carrying the features of one of the two generator elements. As a consequence of this operation, two separate constituents are merged into two separate nodes of the structure. This operation is represented in Figure (7) below, where an adjective is merged with a noun creating a new bigger phrase (NP) with nominal features.

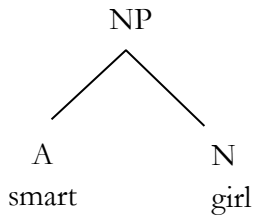


Figure 7. The operation Merge

[7] Interpretable features are those features which are semantically necessary in order to interpret the meaning of a sentence. An example is the plural inflection on regular nouns in English, such as cat-s. The term *cats* can only be used in order to refer to several cats. Since this feature is semantically required for interpreting the plural meaning, it is considered as interpretable.
[8] Uninterpretable features are those which do not contribute to the interpretation of the meaning of a sentence. For example, the feature –s, which refers to the third singular person of a present indicative verb in English is considered as an uninterpretable feature. In fact, the person feature on the verb is not semantically essential in order to understand the meaning of the sentence which can still be considered to communicate something about the individual John.

This process is potentially endless and might thus generate increasingly larger structures.
Under this framework, movement is defined as a remerge operation of the same constituent in a different place within the structure, according to specific constraints.

The notion of c-command is central to the minimalist approach, which is also responsible for the agreement relationships between interpretable and uninterpretable features. Agreement is a syntactic mechanism which allows a relationship to be established between the uninterpretable feature and an interpretable one. It was previously used to account for the agreement relationship between the verb and the subject, but it has subsequently been expanded to all syntactic features. The syntactic agreement relationship triggers the remerging operation in the structure, namely the so-called movement. For a sentence to be grammatical, the uninterpretable features must necessarily be matched with interpretable features before being sent to the spell-out stage, otherwise the sentence crashes. Spell-out represents the moment when the sentence is interpreted in the PF and LF interfaces. Such a model centres on the notion of phase, which has been further developed over the years by Chomsky (2001, 2005) and other scholars.

Phases are syntactic domains which define domains which are impenetrable to movement operations: this theory is called Phase Impenetrability Condition.[9] The phases in the structures are commonly considered to be the vP/VP and the CP. This theory could be considered as the implementation of the previously mentioned subjacency principle.

Despite the MP's purpose of simplifying the theory, many issues of this approach are still under debate. In addition, the different proposals within the MPs provide several solutions to solve problems which are sometimes conflicting.

1.2.2.3. Cartography

By increasing the quantity of languages analysed according to the generative framework, functional categories considered by the previous models, such as IP and CP, are no longer considered adequate to account for the huge complexity of cross-linguistic phenomena.
Basing their assumptions on Kayne's (1994) Antisymmetry theory, a group of linguists in the nineties started to postulate new functional projections in order to establish a fine-

[9] The Phase Impenetrability Condition states that if X is dominated by the complement of a phase YP, X cannot move out of YP.

graded analysis, in line with the explosion of new functional heads in the P&P framework, and with the inclusion of functional elements in the X-bar theory. Such new lines of research are known as cartography. Cartography "is not an approach or a hypothesis", but rather "the attempt to draw maps as precise and detailed as possible of syntactic configurations", by taking into account the "internal constitutions [of these structures] and their interactions with various grammatical principles and processes" (Cinque & Rizzi 2008:42). However, despite the intention to remain a research topic, over time, cartography developed a "coherent body of assumptions and a rather well-defined research direction".

An initial insight was provided by Pollock's split of IP. Pollock realized that a single I position was not enough to account for different morphological forms of verbs in French. His observations led to the postulation of two new projections, expanding the previous structure. His approach summarized two essential trends of cartographic research: "the analysis of the word order properties of verbs with respect to adverbial and argument in terms of head movement" and a concept of inflectional morphology as the "result of movement rules involving roots and affixes" (Cinque & Rizzi, 2008:43), which is carried out at the syntactic level.

Belletti (1990) suggests that we should consider the higher position identified by Pollock as dedicated to subject-verb agreement (AgrS) and the lower as responsible for Tense (T).
The study of the verbal forms related to the argument and adjunct orders has quickly led other scholars to further split the IP into functional heads expressing Mood, Modality, Tense, Aspect and Voice.

In line with Chomsky's (2001) Uniformity Principle, cartography assumes the universality of "the distinct hierarchies of functional projections", especially in the "types of heads and specifiers involved" (Cinque & Rizzi, 2008:45). The stronger assumptions of cartography also consider the numbers and relative orders of functional projections to be universal, while the weaker assumption refuses this hypothesis.

According to the prevalent line of cartography, however, assuming the stronger position is suggested in order to avoid any a priori limitation of the research.
It is certainly the case that the order of functional projections varies cross-linguistically and this can sometimes lead to the necessity of reducing the relative orders which can have been changed by subsequent syntactic movements.
Constant cross-linguistic comparisons are essential in order to create an inventory of functional projections that is as rich as possible. The larger the range of languages

investigated, the more reliable the profiled types and the number and order of the functional projections will be.

Cartographic studies have also shown a very strong interest in exploring the properties required for efficient communicative exchange, such as information packaging, referential relations, argument structure, and scope. In line with these topics, the interest for the Left Periphery (LP) has grown during the last few decades and much research into this elusive field where syntactic and pragmatic phenomena are intertwined has emerged.

Among others, Rizzi (1997) proposed the Split of CP introducing new dedicated positions to account for linguistic phenomena such as interrogatives, relatives, topic and focalized elements. According to his theory, the left periphery of the sentence in the CP domain hosts some positions where different kinds of phrases are syntactically moved. Under this model, syntactic movement "is triggered by the satisfaction of certain morphological requirement of the heads" (Rizzi, 1997).

Milestones in orienting cartographic research are described by the maxim "one (morphosyntactic) property – one feature – one head" which leads us to postulate the derivational nature of complex heads. In summary, surface position might show more than one function, but it comes as result of subsequent movements of the primary head picking up several specifications, in a kind of bottom-trawling process.

Another crucial aspect of cartography concerns the assumption that languages tend towards local simplicity, creating dedicated positions for local attributions of proprieties, even when this tendency risks increasing the global complexity of the system. Topicality within the cartographic perspective exemplifies this concept. Indeed, a specific head for topicality (Top) is postulated in the LP and it activates the interpretation of that constituent as a topic, as shown in the example (12) below.

(11) This book [Top [I will read <this book> tomorrow]]

(Chomsky & Rizzi, 2008:51, ex.4).

The reliability of such a postulated position is also reflected by languages such as Gungbe or Japanese, which make use of morphological topic markers indicating the existence of dedicated syntactic topic positions. Further details about these studies are presented in the next chapter (2).

Such rich analysis might seem to conflict with the postulated simplicity of the Minimalist Program, however it is important to bear in mind the different topics of these

two lines of research. Minimalism “focuses on the generating devices” while cartography concentrates on “the fine details of the generated structures” (Chomsky & Rizzi, 2008:49).
If we take this into account, the two research proposals no longer appear contradictory; indeed, complexity can result from very simple and recursive operations.

1.2.3 Generative studies on topicality

Since the miscellaneous status of linguistic phenomena such as topichood is intrinsically connected to the performance of language and cannot be exclusively addressed in terms of linguistic competence, exploration of the pragmatic-syntactic interfaces in generative studies was only commenced in the late nineties by Rizzi (1997).

By contrast, certaingenerative linguists are beginning to postulate more inclusive models of grammar which also try to account for borderline, pragmatically-driven phenomena, such as information structure (Rizzi 1997; Frascarelli & Hinterhölzl 2007; Poletto & Bocci 2016), extra-sentential issues (Giorgi 2017) and prosodic and discourse features (Giorgi 2018). Their attempt is to integrate the core sentence grammar and the extra-linguistic context into a unique model.

Attention to the intonation and prosodic contours associated with information structure phenomena is also steadily growing, as pointed out by the study of Frascarelli & Hinterhölzl (2007), who have shown that different types of sentence topics are accompanied by different intonations, and that those topics placed in the left periphery of the clause differ from those localized in the right-most periphery of the clause.

Syntactical analyses of topic types were also carried out by considering the different structural properties of topic types (Rizzi 1997, Gregory & Michaelis 2001, Nolda 2013, Giorgi 2015). Thanks to these contributions, the identification of left-dislocated topics, hanging topics, and right dislocated topics has received increasingly detailed analysis. Therefore, for the purpose of the current research, the generative approach is essential for considering topichood from both a syntactic and a structural point of view, by providing a theoretical framework where prosodic, morpho-syntactic and syntactical-pragmatic phenomena are investigated in order to better understand the features accompanying topic types in LIS.

1.3 The Pragmatic approach

Studies on Pragmatics are still in their infancy; linguists' interest in this domain only began in the early seventies. Since then, attention to the field has grown so much that it is now possible to consider Pragmatics as a discipline in its own right, and no longer as a mere subpart of other fields, such as philosophical, linguistic and psychological studies.

In the nineteenth century, linguistic studies were focused on an historical-comparative perspective and the reconstruction of ancient languages by considering the changing of stems and sounds. This approach disadvantaged the effects of the communicative and social contexts in the languages in use, and their relationships with their audiences, which are defined as the performance system in the generative framework. Generativist programs focus their study on the cognitive system, also known as i-language. Conversely, pragmatic studies focus on the performative system of language, called e-language. Only recently have these two theoretical approaches converged, with attempts to unify both.

The following sections offer a brief account of the evolution and definition of Pragmatics from its origins to the present day. § 1.3.1 provides some relevant information about the origins of pragmatic studies; § 1.3.2 explains the differences between macropragmatics and micropragmatics, § 1.3.3 defines the current sense in which pragmatic studies are conceived and § 1.3.4 explains why such a framework is relevant to the current dissertation on topicality.

1.3.1 Origins and first conceptualizations of Pragmatics

The mathematician and philosopher Peirce (1839-1914) is considered the father of pragmatism, but in his conception, pragmatism was not related to philosophy rather than linguistics. In his approach, pragmatics referred to a theory of meaning related to signs and their effects on human behaviour. The theory was further developed by the American philosopher Charles Morris (1901-1979), which brought led to the discipline nowadays commonly known as semiotics.

Morris elaborated a semiotic triangle, which was composed of three branches: (i) syntactics, which considers signs and their relationships to one another, (ii) semantics, which deals with signs and their meanings, and (iii) pragmatics, which considers signs in relation to their users.

A further revision of the semantic triangle was introduced by the philosopher Rudolf Carnap (1891-1970). In basing his definition on the language user, he excluded the social and cultural contexts affecting the uses of language. His theory led some scholars to adopt a very narrow scope of pragmatics, effectively limited to the study of deictic elements. However, at the same time new philosophers started to direct their attention towards an ordinary-language approach, rather than relying upon an ideal language and a symbolic-logic notation. Among others, in his later works Ludwig Wittgenstein (1889-1951) considers meaning not just as words naming objects, but as the various uses of those words within a language. Other influential philosophers of language include J. L. Austin (1911-1960) and John Searle (1932), both of whom discussed the theory of speech acts. The former distinguished three main aspects: (i) the locutionary act, which consists of the basic act of talking; (ii) the illocutionary act, which considers the conventional nature of an act, such as thanking, promising or ordering; and (iii) the perlocutionary act, which describes the effects produced by performing the act, such as persuading or convincing someone to do something. Searle further elaborated the theory of speech acts, focusing on the illocutionary act and pointing out particular rules for that specific speech act.

A further great influence on Pragmatics has also been exercised by H. Paul Grice (1913-1988), who developed a theory about cooperation and conversational implicatures, namely the implicit aspect of meaning that a speaker sends to the addressee without overt mention. By considering conversations among people as cooperative enterprises, Grice elaborated four categories and more detailed maxims. The first category is Quantity, which deals with the quantity of information provided during a communicative exchange. According to the maxims related to this first category, contributions should only be as informative as is required and not more informative than required. The second category is Quality, relating to the truthfulness of the contribution. The third category is Relation, and includes the maxim ‘be relevant’. Finally, the fourth is the category of Manner, which deals not with the content of the contribution, but rather with the way the contribution is expressed.

In communication, interlocutors are assumed to be cooperative, but maxims can also be violated or can clash with each other under specific conditions. Such a theoretical system provides tools for analysing how implicit messages can be deciphered by the interlocutor, and particularly how conversational implicatures work. Conversational implicatures such as implicit messages or ironic expressions may result from the observation or violation of Grice’s maxims.

1.3.2 Toward a definition of current Pragmatics

Over the years, two different cultural and geographic traditions have approached the study of pragmatics: one is the Continental European school which is defined as *the perspective view*, and the second is the Anglo-American school, also known as *the component view* of pragmatics. The first school considers pragmatics as a broader field where linguistic phenomena are studied from the point of view of their process and usage properties. On the other hand, the second school perceives pragmatics as one of the core components within the field of linguistics, clearly distinguishing it from other core components such as semantics, syntax, morphology and phonology.

By unifying these perspectives, Jacob L. May (1993) summarized these views on Macropragmatics and Micropragmatics in his textbook. As for macropragmatics, it conveys the wide range of phenomena addressed by the Continental European approach, such as intercultural or social aspects of pragmatics. On the other hand, micropragmatics concerns linguistic phenomena such as contexts, implicatures, references, speech acts, pragmatic principles, and conversational elements mostly related to the narrow approach of the Anglo-American school. For the purposes of the current study, the term pragmatics is used in the sense of micropragmatics, focusing on the management of referential information within different linguistic contexts by comparing conversations, monologues and elicited data.

Between the 1970s and 1980s, the configuration of pragmatics as an independent discipline radically changed the field of linguistics, and certain paradigm shifts accompanied this shift. In the 1960s and 1970s, in Chomsky's view, linguistic theory referred to the language competence of the speaker and the hearer. This focus excluded the study of linguistic performance, namely how language is performed in specific situations. Gradually, the syntactic theoretical framework started to consider semantics, but the pragmatic nature of certain linguistic phenomena was still ignored or underestimated by the main theoretical approach. The image of a *pragmatic wastebasket*, published in a paper by the Israeli linguist Yehoshua Bar-Hillel (1915-1975), attracted the interest of many linguists, who began to consider the pragmatic issues contained within the wastebasket.

Linguistic philosophers, as well as Chomskyan linguists, had long reflected upon languages by considering the intuition and competence of native speakers. In the late 1970s, together with sociolinguists, many pragmatists started to investigate languages with more empirical methods in order to analyse conversation and discourse through a finely-graded transcription of corpus data. In the 1980s, elicitation tasks began to be

systematically involved in pragmatic investigations. Roleplay, role enactments, and discourse completion became part of the linguist's toolkit. In the 1990s, the largely widespread presence of personal computers led to the explosion of a linguistic data base together with a new, statistical way of analysing corpora. These technological innovations did not completely replace existing strategies such as introspective methodology, and instead diversified analytic and investigative resources. With a more flexible approach, linguists used several research methods simultaneously to choose the best tool forthe specific object of study.

Further paradigm shifts included a dwindling interest in homogeneous phenomena, which were gradually replaced by heterogeneity and variations, as well as a more dynamic and diachronic analysis of languages, where older and newer forms could co-exist. In this vein, historical pragmatics established itself as a respectable branch within the study of pragmatics.

1.3.3 Pragmatics studies and topicality

Sentence topics in pragmatics studies have been investigated as a linguistic phenomenon, through consideration of the non-linguistic features of human interactions. One pragmatics study carried out by Reinhart (1981) considered the notion of aboutness topics, and represents a milestone in defining what aboutness topics are and which criteria can enable the linguistic identification of such expressions.

According to Reinhart, aboutness topics cannot be identified as constituents bearing given or old information, nor according to theoretical and empirical grounds. Instead, they should be interpreted "in terms of the effects of a given pragmatic assertion on the context set and the organization of the information in this set" (Reinhart 1981: 53). In this light, sentence aboutness topics are tools available in a language for managing and classifying the information shared in a discourse. These concepts and their evolution are addressed in detail in chapter 4 of this thesis.

Mira Ariel (1988) has also carried out significant studies in pragmatics with respect to referring expressions and accessibility. She has conducted a detailed analysis distinguishing between the types of referring expressions combined with their accessibility grades, according to the principle of Relevance which states that "the lower [the] Accessibility marker, the more lexical information it normally incorporates" (Ariel 1988). Such Accessibility grades are established as universal, because the same hierarchy is assumed to be true for all languages. Further observations about these pragmatic theories are considered in chapters 2 and 6 of this thesis.

The studies of pragmatics represented an important starting point for the current investigation, they provide an initial insight into crucial linguistic notions which are still under debate within the worldwide linguistic community.

1.4 Functional-Typological approach

The present section offers a very basic outline of the functional-typological approach, considering its origins (§ 1.4.1), the core assumptions of its theoretical framework (§1.4.2), and its importance to research carried out in the current dissertation (§1.4.3).

1.4.1 Origins and first conceptualizations of Functional-Typology

Linguistic typology is a broader discipline which contains many sub-approaches. According to Croft (2003) three macro-lines exist within linguistic typological studies.
The first one is the *typological classification* approach, which attempts to provide a taxonomy of structural types by basing this categorization on the cross-linguistic properties of language. The cross-linguistic investigations into morphology or word order carried out in the nineteenth and early-twentieth centuries were mostly representative of this line of research.

The second typological approach is *typological generalization*. Studies in this category tend to find and analyse universal linguistic patterns which occur systematically across languages. Typological generalization also aims to elaborate universal predictions by empirically analysing cross-linguistic patterns. These are called *implicational universal predictions* and are useful for anticipating variations within a specific type of language. A famous example of an implicational universal prediction is the generalization that "if the demonstrative follows the head noun, then the relative clause also follows the head noun" (Croft, 2003:1).
Implicational universal theory began with Joseph Greenberg (1915-2001), who first introduced this concept and the empirical method for comparing large quantities of data at a cross-linguistic level.

The Greenbergian quest for universals is close to that of generativism: the basic difference lies in their adopted methodologies. Indeed, generative studies seek to establish a formal and theoretical approach for finding such universals, following a top-down process which assumes the existence of universal linguistic structures, while, on the other hand, typological generalization scholars base their research on empirical data,

by looking at the quantitative cross-linguistic comparisons from which they identify language universals.

The third line of investigation was defined as the functional-typological approach. The term functional refers to the functional framework, which shares the primary consideration for the function of linguistic structures with these theories. By contrast, the language theories of generativism consider grammar as a set of generative rules, and this is the reason why this approach is known as formalism.

Before introducing the functional-typological approach, functionalism needs to be briefly mentioned in order to better understand its influence on typological studies. Functional approaches, unlike generative theories, are focused on the social and communicative aspects of language and consider language as a performance, by also considering the ways in which a language is used.

A crucial functional theory was elaborated by Halliday (1994) and concerns the conception of language as being composed of ideational and interpersonal meanings. Ideational meanings relate to the speaker's attempts to understand their surrounding environment, while interpersonal meanings concern the speaker's goal to influence other people within the same environment.

This functional view of language established three different levels of linguistic analysis: the message, or the communicative content; the exchange, or the interaction between interlocutors with respect to the types of clauses adopted; and the representation, which reflects some properties of the human experience, such as thinking, doing or saying.

The functional-typological approach is deeply influenced by functionalism and moves typological generalisation a step further. It also seeks to explain how the analysed structural cross-linguistic patterns are used for the purpose of communicative interaction. The functional-typological theories were commonly recognized in the seventies, thanks to studies carried out by linguists such as Givón, Hopper and Thompson. In the next section, the essential points of this theory are outlined.

1.4.2 The core Functional-Typological assumptions

For the purpose of their studies, typological linguists adopt a wide range of cross-linguistic samples, which change according to the characteristics of the phenomenon under investigation. The average number of languages usually considered can be between one and two hundred. This large sample size is essential for the legitimacy of

any generalizations made. Moreover, language samples are carefully selected in order to avoid factors such as common origins of languages or potential connections, which might affect a study's reliability.

Thanks to these studies, linguists have discovered that languages vary according to different constraints and that these constraints can be summarised in implicational universal statements. As a result, the observation of constrained variations is responsible for providing language universals, unlike generative theories, which assume a set of universal principles for discoveringcommon features across languages.

In the typological framework, such constraints are considered as *unrestricted universals* and establish the common patterns of a particular phenomenon across different languages. They differ from implicational universals, which consider constraints with respect to all potentially existing patterns. An example of an implicational universal which has been previously shown states that the position of relatives must follow nouns if demonstratives follow nouns in the considered language.
The essential concepts for explaining cross-linguistic pattern variations are economy and iconicity. The former concept relates to the principle of least effort, which states that a language aims at achieving the maximum result through the minimum cost in terms of energy. The second concept, iconicity, refers to the property of languages for reflecting human experiences. This concept is further developed in the following chapter, since it is particularly important for sign languages.

The functional-typology linguist Hopper coined the term *emergent grammar* in 1978, referring to a flexible conception of grammar modelled by discourse and personal interactions between interlocutors. This kind of grammar does not focus on abstract categories, but rather is strongly anchored in the concrete forms carried out in a specific context of utterance.

One group of methodological tools used by functional-typological linguists is semantic map models, which seek to provide a visual summary of the cross-linguistic regularities in semantic structures.
A semantic map represents a language-specific structural pattern, which is based on a universally shared system of knowledge or a universal conceptual space. In this respect, functional-typological theories are closely related to cognitive studies (addressed in the following section §1.5).

In the next subsection, functional-typological theories are considered in relation to the analysis of sentence topic types carried out in this research.

1.4.3 Functional-Typological studies on topicality

Functional-typological studies aid in investigations of linguistic phenomena related to topichood; Givón's (1984) studies on referentiality and definiteness help us to better understand the management of presupposed information between the speaker and the addressee. Indeed, the referential intent of the speaker affects the way in which information is packaged, while definiteness grammatically reflects the speaker's assumption that a certain nominal expression can be uniquely identified by the hearer.

Moreover, these concepts are essential for the identification of criteria to distinguish between sentence topic types, such as aboutness topics, by considering the referential status of these expressions. This leads to the referential accessibility of nominal constructions. This concept, already present in the pragmatic framework, is concerned with how easily the hearer might be able to retrieve the information already present in her mental storage according to the speaker's perspective.

Definite topics are cross-linguistically coded by a wide range of strategies, and the chosen grammatical codification prompts the hearer to select a different range of contexts in which he can search for access to their resolution. For example, a spatial deictic suggests that the hearer is searching for an extra-linguistic physical context, while a personal deictic pronoun would suggest the linguistic expression's identification with one of the interlocutors. Similarly, the prototypical functions of subject and object roles may be correlated with the communicative importance of topic. Zero anaphora, for example, requires the closest proximity to the referential expression with which it is bound, and such omissions most commonly apply to subject expressions rather than objects.

Addressing these and other concepts is crucial for analysing studies about topichood and functional-typological studies, such as those carried out by Givón (1976, 1983a, 1983b, 1990), Li & Thompson (1976), and Niels (2007), which largely contributed to successful investigations of these linguistic phenomena.

1.5 The Cognitive linguistic approaches

Cognitive studies are difficult to consider as a uniform theoretical framework; rather, they area collection of several different cognitive theories. Cognitive linguistic studies

are considered here in order to provide a background for the topics addressed in the following chapters, especially chapter 6.

Cognitive linguistic is a relatively new branch in the field of psychology and linguistics, and focuses on the interaction between language and cognitive processes. The following sections briefly outline the origins of cognitivism (§ 1.5.1), providing basic notions about the theoretical points developed by cognitive scholars (§ 1.5.2) and comparing these assumptions with those carried out in generative linguistics from a multi-theoretical perspective (§ 1.5.3). In § 1.5.4., the relationships between cognitive studies and investigations into topichood are discussed.

1.5.1 Origins and first conceptualizations of Cognitive linguistics

As previously mentioned, several different approaches are integrated within the more general framework of cognitive linguistics. This polyphonic union of voices and theories makes it difficult to identify cognitivism with a particular researcher or a single specific work. Indeed, cognitive linguistics is the product of multiple independent and unrelated studies in different countries, whose authors discovered comparable models and shared basic ideas by reading one another's work in a bottom-up process.

Despite this initial heterogeneity, multiple scholars have offered their own fundamental contributions to cognitive linguistic studies, or to one of its branches, thereby gaining major visibility.

Some cognitive studies unfold from critical positions set out in the generative framework. One of the main contributors to cognitive linguistics is the linguist and philosopher George Lakoff (1941-) who was trained in the transformational grammar approach formulated by Noam Chomsky. Starting with a generative background, he attempted to integrate the basic notions of transformational grammar with formal logic. Together with other students of Noam Chomsky, he began to elaborate a generative semantic theory supporting a more independent relationship between syntax and semantics, in opposition to the autonomy of syntax established by generative theories. Some of the central ideas of generative semantics were later incorporated into the Cognitive linguistic approach.

Together with other scholars (Fillmore et al. 1988; Kay & Fillmore 1999), Lakoff attempted to investigate the units of language by providing an inventory of them. This approach is known as *construction grammar*.

A second crucial theoretical contribution to cognitive linguistic studies comes from the linguist Ronal Langacker (1942-) who conceptualized the notion of *cognitive grammar*. According to this theory, grammar is not conceived as an autonomous system, but as part of cognition, inextricably interrelated with meanings and mental processes. This line of inquiry focuses on the structure of language which is considered a reflection of general human cognition.

Cognitive linguistics theory is the result of general trends in linguistic perspectives, such as the acceptance of flexibility and language variability, and it fosters attention to language phenomena previously considered marginal or insignificant. In this way, cognitive linguists focus on irregularities, which they regard as a necessary and inextricable part of language, although this stance has elicited strong criticism because of the consequent weakness of a systematic scientific approach.

Textlinguistic theory, a branch of studies which started within the generative framework and focused on the semantic-pragmatics interface, is an important aspect of cognitive linguistic analysis, The quest for answers that remained unsolved by generative theories led some linguists to elaborate new analytic tools and conceptual methods to study intrasentential topics. Textlinguistic theories in particular seek to understand how individuals mentally process texts, and how semantic-pragmatics phenomena interfere with syntactic features such as the selection of definite articles or the realization of shared information.

The studies on text-processing led to postulations on the human conceptual categorization of knowledge in scripts and schema, closely related to Fillmore's (1976) theory about Frame semantics.

Such theories consider the meaning of single words not only as self-contained in abstract terms, but also as a product of their lexical relationship within a coherent structure. In this view, linguistic semantics is deeply correlated with encyclopaedic knowledge. The theory of Scripts and Schemas also attracted the attention of studies into artificial intelligence and the automatic production of texts, which converged within the cognitive linguistic field in the mid-seventies.

In 1990, the first specialized linguistic journal on cognitive studies was established: *Cognitive linguistics* established its position among the modern linguistic frameworks of research.

1.5.2 The core cognitive linguistic assumptions

Under cognitive theories, language is postulated as reflecting cognitive functions, such as the properties and modalities in which the human brain organizes thoughts and ideas. The human language encodes thoughts and ideas through symbols, which are composed of pairings of form and meaning. Form is the phonological or physical realization of the encoded symbol, while meaning is the semantic content of a linguistic element. Meanings are connected to our mental representations, which are described as concepts, and concepts come from the perceptions we form about an external world.

Cognitive representations are further divisible into subsystems: the lexical subsystem, which contains content functions, and the grammatical subsystem, which contains structuring functions. The latter also provides the scaffolding in which the lexical elements are organized, namely a schematic meaning. According to the cognitive model, a linguistic unit may be a morpheme, a word, or even a string of words or a sentence. Indeed, idiomatic meaning can be directly associated with constructions, while literal meaning is derived from the compositional processes of smaller parts of the structure.

The theories developed within this framework are characterized by two different commitments: the first is the Generalization Commitment, which aims to capture universal generalizations by categorizing human cognitive processes. The second is the Cognitive Commitment, which provides general principles relating them to cross-disciplinary studies on the brain and the mind. Therefore, in such a model, syntax, lexicon and morphology are not separated from each other, but are parts of the same continuum, and the grammatical structures are symbolic units, each provided with meanings. The cognitive system sets schematic templates on which the speaker and the addressee base and modulate their expectations about the communicative exchange.

Language universals are therefore deeply related to human cognition, but unlike the generative framework in which rules precede and determine the language uses, in cognitive linguistic theories mental schemas arise from patterns of language usage. Moreover, in the cognitive model, schemas and lists of constructions are both comprised of the grammar and recursion of these structural patterns, which enable language users to create new grammatical constructions, as stated in the Langacker grammatical model (Evans and Green 2006).

In cognitive linguistics the embodied cognition hypothesis is central and concerns the complex relationship between mind, language and experience.

1.5.3 Overcoming the "linguistic war"

Despite the theoretical differences, it is possible to find common linguistic phenomena which have been investigated by both generativism and cognitivism. One of these shared topics concerns the taxonomy of word classes. Generative theories consider word classes in terms of their morphological and distributional features. By contrast, in cognitivism, word classes are considered from a semantic characterization and as such the morphological and distributional properties of word classes are only epiphenomenal features.

Moreover, in both approaches, the head determines the features of the phrase in which they are contained. The difference is that cognitivism considers these features to be related to the schematic meaning, such as THING for nouns and PROCESS for verbs. On the contrary, the generative approach relates these features to grammatical categories, such as N (nouns) and V (verbs). Dependency is a common notion as well, but what changes here is the conceptualization of this asymmetric relationship. Under generativism, dependency concerns the selection of grammatical categories, which can be obligatory, as in the case of argument selection, or optional, as for the selection of adjuncts and modifiers. In contrast, in the cognitive model, dependency is correlated with conceptually dependent relationships, and the directionality of dependency between constituents is not a one-way relationship, but rather bidirectional. Bi-directionality means that a head may be semantically dependent on its dependent element, if such an element contributes to elaborating its structure.

Most importantly, these approaches have different conceptions of constituents. In the formal generative model, words and rules are primitives and determine sentence structures together, as opposed to the cognitive model where compositional structures are considered immanent in grammatical constructions and can be stored and mentally reanalysed as simple units if the individual components of this structure have become semantically autonomous.
Grammatical categories such as subjects and objects are also analysed differently. The generative model considers their morphological and syntactic features, while in the cognitive model prototypical subjects and objects respectively represent the energy source and the energy sink of a sentence. Attentional focus is crucial for the linguistic function that these two categories fulfil. Moreover, according to the cognitive point of view, the grammatical properties of structures, such as cases, are consequential to their semantic features.

Despite this and other differences in establishing a linguistic model, cognitivism and generativism share a common ground of linguistic phenomena. In light of modern approaches, it is important to consider both models as valid attempts to better understand the proprieties of human language, so that any linguistic war might be overcome and we may benefit from the suggestions coming from different scientific perspectives.

Linguists such as Fillmore and Key have provided borderline theories between cognitive and generative studies. Such theories represent a common scientific effort to uncover complex phenomena by providing and validating explanations and models which are all part of the same human quest.

1.5.4 Cognitive studies on topicality

Cognitive theories are crucial for investigating phenomena which are related to anaphoric resolution or referential categorization, since they focus on the communicative exchange between interlocutors.
Linguistic phenomena, includinganaphora resolution, are explained by cognitive linguists, who consider more general principles which are also valid in other areas of human cognition, such as perception, connectivity or conceptual distance.

Some of the linguistic elements considered in this research, such as scene-setting topics, along with their labels and identification criteria, were first theorized within the cognitive framework (Chafe, 1976), and then exported into cross-disciplinary investigations.

Furthermore, in this dissertation, chapter 5 offers an investigation of the hierarchical organization of referential information, a domain which has been widely analysed by cognitive studies in both spoken and signed languages (Chafe 1976, Gundel 1985, 2003, 2016, Lambrecht 1994, Perniss 2014), especially in reference to the concept of retrievability of shared information between interlocutors.
The notion of the activation state of a referent intrinsically correlates with the cognitive status of referential items. Similarly, the concept of identifiability, which assumes that a referent is considered as identifiable in the addressee's mental representation, or the notion of presupposition, which relates to the status of a proposition already stored in the mental representation of the speaker and interlocutors. Since these and other concepts are closely related to the way in which knowledge is conceptually managed by face-to-face interactions, cognitive studies provide essential context for research on these topics.

Importantly, the boundaries of theoretical frameworks are not always so clear-cut, and studies may adopt borderline theories and consider notions that are debated across more than one single framework.

1.6 Conclusions

The choice to consider a method employing multiple view-points is part of the attempt to more thoroughly explore the complex phenomena of human language.

As well as demonstrating an awareness of the theoretical issues which have divided academics for years, this research is an attempt to provide a linguistic investigation of topichood through a multi-theoretical perspective. This type of study is powerful because multiple approaches can provide a multi-faceted picture of topichood.

Furthermore, in recent years, the development of studies on sign languages around the world has challenged existing theoretical assumptions, which were previously only focused on the vocal-acoustic modality. Studies on sign language have emerged from many countries. Advances in the theoretical models are required in order to address the many different aspects of these languages. The potential of a broader view, through a consideration of insights from different theoretical frameworks, is significant.

In the following chapter, pragmatic, syntactic and prosodic studies relevant to the current dissertation and carried out in spoken and sign language will be considered in detail.

CHAPTER 2
Information structure and topicality

2.1 Introduction

Following Halliday's (1967) and Chafe's (1976) definition, the specific interaction in a discourse between conversational structure and syntax has been referred to for decades as *Information structure* or *packaging of information*.

A key feature of information structure lies in the juxtaposition between old and new information. Among the numerous labels for this binary relationship, two of the most common are topic and focus. Focus is traditionally conceived as the new part of the information, and is prosodically marked or accompanied by a prominent stress. On the other hand, topic is traditionally defined as the old part of the information that has already been shared between speaker and addressee, and which usually corresponds to the prominent non-prosodic part of a sentence (Chafe 1976, Prince 1981a, Benincà and Poletto 2004, Frascarelli, Hinterhölzl 2007).

Within a communicative exchange, the sphere of discourse may be separated into two macro-areas: the text-external world, which involves speaking participants and speech setting, and the text-internal world, which consists of linguistic expressions and meanings. The form in which linguistic expressions denote entities depends on "whether, and how recently, mental representations of these entities have been established in a discourse" (Lambrecht 19994: 38). The packaging of information deals with this composition of grammatical levels, where linguistic forms and mental states about referents for the speaker and the hearer are involved. In this sense, packaging phenomena are related to the accommodation of the speaker's speech according to certain temporary states of information in the addressee's mental storage (Chafe 1976).

According to Chafe (1976), the term packaging is primarily concerned with "how the message is sent and only secondarily with the message itself", so he stressed the way such content is transmitted, downplaying the lexical and propositional content. In line with this conception of packaging phenomena, Chafe (1976) started to identify certain characteristics pertaining to the management of information with respect to a noun, such as its given or new status, its definite or indefinite condition, the fact that it could be the focus of a sentence, or the fact that it may represent the subject or the topic of a

sentence, and also the coincidence of the individual the noun refers to with the point of view of the speaker. These considerations represent an attempt to create a unified picture of the complex factors which interact within the sphere of discourse, with regard to the syntactic roles and features of a topic, and the cognitive and almost psychological considerations of the referential status of this topic. It is possible for the syntactic aspects to be clear-cut and therefore relatively easy to analyse, however the cognitive issues regarding situational uses of referents are uncertain and frequently debated among scholars.

Other studies (Lambrecht 1994) have focused on the grammatical relevance of these information phenomena, albeit considering the pragmatic relevance of pragmatic contexts and conversational implications. According to this hypothesis, information structure is conceived as:

> "That component of sentence grammar in which propositions as conceptual representations of states of affairs are paired with lexico-grammatical structures in accordance with the mental states of interlocutors who use and interpret these structures as units of information in given discourse contexts."
>
> (Lambrecht, 1994:5)

The assumption that information structure is an aspect of grammar is based on the grammatical features involved in a sentence production with several combinations of morpho-syntactic, prosodic and lexical aspects. According to his theory, there are two basic types of information structure categories: the first concerns the mental representations of entities and involves psychological factors such as knowledge and the consciousness of speaker and hearer. The second type emerges from pragmatically construed relations between referents and prepositions, and specifically refers to the topic and focus relationship.

However, depending on the perspective of the studies in the literature, packaging information phenomena may be analysed by pointing out different properties and categories, such as the givenness-newness pair (Chafe 1976, Lambrecht 1994), or some givenness-specific notions linked to the speaker's and hearer's mental representations and assumptions (Prince 1981, Kuno 1972, Halliday 1967).

As for the binomial relationship between givenness and newness in the packaging information, givenness represents "the knowledge which the speaker assumes to be in the consciousness of the addressee at the time of the utterance" while newness

represents “what the speaker assumes he is introducing into the addressee’s consciousness by what he says” (Chafe 1976:30). A similar distinction is made between topic and focus information (Lambrecht 1994), which is considered in terms of “speaker’s assessment of the relative predictability vs. unpredictability of the relations between propositions and their elements in given discourse situations”. Cross-linguistically, such a relationship may also be reflected in the prosody or presence of specific morpho-syntactical markers, the categorical syntactic choice of the form of constituents, the position of these constituents within the sentence and other related lexical expressions. A deeper consideration of these topics is presented in § 2.2.2 and § 2.2.3.

Moving onto the specific categories attributed to givenness, the information packaging is conceived as the tailoring of a sentence which is done according to the speaker’s hypotheses about the mental representations of the referents in the hearer’s mind at the time of utterance. Many levels of interpretation come from the literature about the concept of givenness. In line with Kuno (1972) and Halliday (1967), Prince (1981) identified three different properties related to givenness: the first is the notion of givenness as predictability or recoverability, which implies that an element in a sentence can be considered old if it is recoverable from the precedent context. By contrast, new information is unpredictable. Regarding this level, Kuno (1972) also reflected on the anaphoric value of givenness, as opposed to the non-anaphoric value of new information, and this topic is further discussed in § 2.2.4.

The second property attributed to givenness is saliency (Prince 1981; Chafe 1976), and it is defined in terms of what is assumed by the speaker to be in the consciousness of the hearer. The third aspect of givenness is related to the notion of shared knowledge. This concept differs from the previous considerations because the speaker’s assumption about what is known by the hearer is defined in terms of what the hearer already knows, independently from what he is thinking at the very moment of the utterance. Therefore, this broader conception of givenness leaves the time at which the addressee acquired the knowledge as undefined.

Lambrecht (1994) drew attention to two other properties which are generally attributed to the given part of information, namely identifiability (already postulated by Chafe 1976) and activation, and by doing so he introduced a subtle distinction with respect to the broader and more ambiguous notions of shared knowledge. According to his model, an identifiable referent is one for which a common representation already exists in the speaker’s and the hearer’s mental storage at the time of utterance, while, by contrast, an element is considered unidentifiable if this representation only exists in the mental

storage of the speaker. There is a strict correlation between identifiability and the grammatical method of encoding referents, the most common pertains to the category of definiteness, which is further addressed in § 2.2.4.1.4. However, such a connection is not meant as a perfect correspondence, and no direct correlation between identifiable referents and definite expressions exists.

The other givenness-specific property is activation. This notion better specifies the grade of accessibility of a referent contained in the addressee's mental storage. Indeed, there is clearly a difference between knowing something in general and having something in mind at the moment of utterance. For an interlocutor, awareness of a referent is not enough to retrieve that specific information. What matters is that the known information is also easily accessible in his or her mind. Such a limitation is attributed to and justified by the short-term memory of speaker and hearer. The concept of activation is further developed in § 2.2.4.2.

An interesting correlation between syntactical forms and the pragmatic aspects of givenness elements was introduced by Prince (1988a) via the new term *assumed familiarity*. Through this concept, Prince attempted to provide a taxonomy of values, which attests to the familiarity postulated by the speaker about information already known by his interlocutor. A cooking metaphor is employed by Prince to describe the assumed familiarity: he says that the writer of a recipe "has a certain set of assumptions about what the reader knows about ingredients, processes, and equipment, about what equipment the reader has available and about what staples the reader keeps on the shelf" (Prince 1988a: 234-235). Therefore, texts are intended as "sets of instructions from the speaker to the hearer on how to construct a particular discourse model". In the model postulated by Prince, there are (i) discourse entities, (ii) attributes and (iii) links between entities. The discourse entities represent either an individual, a class of individual, a concept, or a substance introduced into the discourse, and are realized as nominal phrases within a text. Starting from these assumptions, Prince categorized the notion of assumed familiarity in a detailed analysis. In this concept, three macro-classes are contained and distinguished as: new information, inferable information and evoked information according to the familiarity grade assumed by the speaker. This model is presented and further discussed in § 2.2.4.2.

Lambrecht (1994) increased the attention given to other categories relating to the information structure, specifically the (i) presupposition, that is elements already known or taken for granted by the interlocutor at the time the sentence is pronounced, and assertions, namely, the information an interlocutor is expected to have deposited in his mental storage after having heard the sentence uttered. In this sense, pragmatic

presuppositions correspond to old information, and pragmatic assertions to new information.

It is important to note that despite taxonomic attempts to classify the properties and categories of givenness, the extra-linguistic and linguistic aspects, as well as the pragmatic, syntactic and prosodic features concerning topicality, should always be considered as interrelated.

2.2 Sentence Topics in Spoken Languages

As evident in the previous section, studies on topicality in the literature on spoken language have generated a plethora of terminological stratifications and labels which have made it difficult to create a clear-cut definition. The following chapters are intended as a guide-line to establish the background for setting out definitions about the main aspects of topicality which are useful for the development of the current analysis. Furthermore, a clearer distinction is provided regarding the pragmatic, syntactic and prosodic properties of topichood, and special care is taken with respect to the referential status of information and its accessibility.

One primary distinction that must be established concerns the scope of the topicality application; indeed, it is important to differentiate between discourse topics and sentence topics (van Dijk 1977, Reinhart 1982). The former are larger textual units consisting of information that revolves around a broader idea or a general concept with the function of unifying a text. These arguments represent what a whole text is about and may be graphically encoded by paragraphs or sections. By contrast, sentence topics consist of sentence-level elements with the function of establishing the entity on which something new is predicated. These elements are quite hard to identify: they may coincide with syntactic subjecthood, but this is not always the case, and indeed, topics may appear in other syntactic roles within a sentence, for example, as objects. Furthermore, different syntactic or prosodic strategies are able to encode topicality cross-linguistically, for instance, (i) specific dislocated constructions or sentence-initial positions, (ii) passive structures, (iii) lexical forms with the function of introducing a change in sentence topic, such as the formula “as for” in English, (iv) morpho-syntactic markers which may signal topic items, (v) prosodic cues, such as de-accentuation, which merge in relation to the most prosodically prominent element of the sentence (focus), and many others.

From a pragmatic point of view, the ambiguous and extensive meaning of the term (sentence) topic in the literature led to it being identified from time to time with

different interpretations, such as old information (Halliday 1967, Kuno 1972), given information (Chafe 1976), or assumed familiarity between the speaker/writer and the hearer/reader (Prince 19881a). In the present study, the notion of topicality is restricted to those textually previously-mentioned referents and adheres to two pragmatic types of topic: aboutness and contrastive topics (Gundel 1988, Reinhart 1981, Frascarelli & Hinterhölzl 2007). The third type of topic under investigation, scene-setting topics, represents an exception encoding both given and not-given information. Indeed, these elements function as frame setters establishing the background for the interpretation of the sentence (Chafe 1976, Krifka 2008). A more detailed outline of these pragmatic types of topic is provided in § 2.2.1.

Although in numerous studies topicality was analysed by considering both syntactic and prosodic categories, topics only started to be accounted as part of a formal syntactic structure in the nineties, when scholars explored their distributional properties with respect to the order of other discourse-related items placed in the left-pheriphery of the structure, such as focalization phenomena or interrogatives. Such analysis, initiated by Rizzi's Split of CP (1997), has been further addressed recently by other linguists (Benincà & Poletto 2004, Frascarelli & Hinterhölzl 2007, Cruschina 2010, Giorgi 2015). These individuals contributed to a more detailed analysis of the syntactic features correlated to different types of topics and encoded in dedicated projections. Further details regarding the syntactic properties of sentence topics, their distribution and their syntactic nature are provided in § 2.2.2.

Prosodically, given information is often expressed in a mitigated manner with respect to new information, and this weakness may be phonologically reflected. Indeed, given items are generally pronounced with a lower pitch than new information and they can be morpho-syntactically simplified according to the context, as in the case of phenomena as pronominal reduction or zero anaphora. § 2.2.3 addresses these types of prosodic issues.

The following chapter will diverge from the analysis carried out so far, in order to better distinguish pragmatic-cognitive oriented studies from syntactic and prosodic oriented studies. Indeed, topic phenomena are the result of interactions between linguistic systems: pragmatic, syntactic and prosodic, therefore it is crucial to keep in mind that these threefold aspects are always coexistent at different levels of analysis. What changes across these approaches is the attention to the cognitive or pragmatic contexts, the syntactic-grammatical aspects, or the prosodic strategies pertaining to this phenomenon.

A pragmatic-cognitive oriented approach is evident in the studies carried out by Chafe (1976), Prince (1981a), Reinhart (1981, 1982), Gundel (1988, 2003), Ariel (1988), Buring (2014). These linguists generally investigate the inherent properties of topicality in terms of the speaker's assumptions, codifying the referential status of sentence topics, in order to make them easily accessible to the hearer.

The syntactic-oriented approach focuses on a considered syntacticization process, through which the formal properties of topics are analysed with respect to the remaining part of the structure and codified in dedicated projections, in line with a cartographic analysis. Nowadays, studies like these constitute a productive basis for detailed analysis of topicality (Rizzi 1997, Benincà, Poletto 2004, Frascarelli & Hinterhölzl 2007, Cruschina 2010, Giorgi 2015). Finally, studies of prosody and intonation are sometimes part of syntactic approaches and are considered as reflective strategies of the syntactic structure (Frascarelli & Hinterhölzl 2007).

2.2.1 Pragmatic aspects of sentence topics in spoken languages

Linguistic studies have long argued for clearer differentiation between the various types of topics, and questioned the pragmatic nature of these elements or reflected on the ways in which they convey pragmatic information and interact with previously mentioned referents.

In the past, the concept of topic was extensively discussed in the research of the Prague School[10] and was treated as old information. Furthermore, *topic* was often identified with the subject of an utterance (Hornby 1972). This was a simplified definition, however. In fact, although they share many common features, topichood and subjecthood cannot be conflated. There are subjects that may act as non-topic in a marked clause and non-subjects that can be topicalized in certain constructions. It is important to distinguish the nature of topic from the way in which topics are expressed and realized.

According to other scholars (Kuno 1972, Reinhart 1981), defining topichood as old information is insufficient, and it is important to use a definition of sentence topic which includes the notion of pragmatic aboutness. In line with this assumption, each declarative sentence was associated with a set of possible pragmatic assertions (PPA). This means that the content of any assertion could be introduced into the content set of that sentence, expanding knowledge ofthe topic. This theory is also known as the

[10] This was an influential group of linguists who proposed a developed method of structuralist analysis during the years 1928-1939.

aboutness theory, where a topic represents the entity ont which the sentence may predicate something new. Furthermore, the syntactic form of a given sentence may restrict the choice of potential topics, thus forcing the sentence to have just one fixed topic, such as structures with a clitic left dislocation.

Responding to the common confusion between pragmatic and syntactic phenomena, Gundel (1985) separates pragmatic topics from syntactic topics. According to her, the former are entities identifiable from the extra-linguistic context, while the latter have a direct expression in the sentence. Gundel claimed that there is empirical and cross-linguistic evidence to show that topic expressions must be either definite or generic in order to be uniquely identifiable from the addressee, although other scholars have denied this overlap (above all Reinhart, 1982). Gundel defined topic as a shared knowledge entity according to the Topic-Familiarity Principle[11] and Topic-Identifiability Principle.[12] Following general principles of successful communication, topics precede comments, where topics are what the sentence is about, and comments are what we say about them.

Vallduvì (1990), avoiding established diatribes on the adoption of a definition, disregarded the notion of topic by dividing the sentence into focus and ground, and further separating the ground into *link* and *tail*: S{Focus, Ground}; G{Link, Tail}. Ground is the non-focus information part of the sentence; it anchors the sentence to what is already established or under discussion in the hearer's mental state. The ground includes two different specifications: (i) link information, which indicates the contact point between the information and the hearer's stored knowledge and (ii) tail, which, if present, instructs the hearer to substitute the focus information in place of existing information in the knowledge store.

Lambrecht (1994) restricted his concept of topic by defining it as a pragmatically construed sentence relation. Here, *pragmatic* means a relation construed within a particular discourse context, hence topics are expressions of aboutness held between a referent and a proposition with respect to a particular discourse. Such a definition does not concur with the idea of topic as that element which comes first in a sentence, a hypothesis frequently used by other scholars (Halliday 1967, Gundel 1985). Furthermore, Lambrecht's (1994) notion of topicality also differs from Givón (1983) who defines the term topic as referring to any participant in a discourse, without

[11] Topic-Familiarity Principle: An entity, E, can successfully serve as a topic iff both speaker and addressee have previous knowledge of or familiarity with E. (Gundel 1988:212, ex. 5).
[12] Topic-Identifibility Condition: An expression, E, can successfully refer to a pragmatic topic, T, iff E is of a form that allows the addressee to uniquely identify T. (Gundel 1988:214, ex. 10).

distinguishing between topical and non-topical participants. The cross-linguistic aboutness topic theories and their related issues are explored in detail in § 2.2.1.1.

Aboutness expressions are not the only elements analysed as topics by previous studies in the literature. Chafe (1976) first reflected about the background information which sets the scene, restricting the interpretation of the remaining part of the sentence. Krifka (2008), developing Chafe's (1976) definition of topics as frame setters, elaborated the concept of scene-setting topics as alternatives which "choose one out of a set of frames and state that the proposition holds within this frame". These kinds of topics have a hybrid nature because explicit frame setters can bear new information and do not have to be givenness. Although the interpretation of such expressions as topic is still debated among scholars, it seems that their function as scene-setting elements may be determinant in analysing them as specific topic types. Previous studies on scene-setting topics in spoken language are discussed further in § 2.2.1.2.

According to some linguistic approaches (Lambrecht 1994, Krifka 2008), contrastive elements may also be considered as topics, even though their topical nature is probably not completely pure. Indeed, since contrastive topics can display a rising accent, they have been accounted for by some scholars as combined elements which present both topic and focus features. Specifically, they have been considered as aboutness topics within which the focus is contained. By contrast, other approaches support the independent existence of the category of contrast, which may overlap with the focus or topic items of a sentence, giving rise to contrastive topics and contrastive focus. According to previous studies (Büring 2003), contrastive topics are produced as questioning strategies in the cases where they function as forms of incremental answering in respect to the common ground (CG). In this context, accommodations with CG management are usually requested by contrastive topics. These are not the only cases, however. Contrastive topics may also occur when the answer does not satisfy the expectation of the question at all, or when the assertion does not provide a real answer (Krifka 2008). Contrastive topics are further addressed in § 2.2.1.3.

2.2.1.1 Pragmatic aspect of aboutness topics in spoken languages

As anticipated in the preceding section, since "a sentence is felt to be about the referent of a given NP" it is possible to define such a given constituent as the aboutness topic of a sentence (Reinhart, 1981:60). This definition comes from the speaker's assumption that the information in discussion is already present in the mind of the addressee (Principle of Presumption of Knowledge) and this also pertains to the non-arbitrary procession of information in a discourse (Principle of Relevance). Indeed, a similar

aboutness theory considers topicality as the result of an interaction between an argument and a proposition relative to a context. Reinhart (1982) elaborated the notion of Common Ground according to the ways in which speakers and hearers model their knowledge on the basis of their communicative needs. Therefore, Common Ground is conceived as a container for the information retained in the mental storage of both speaker and interlocutor. Reinhart (1982) also established the metaphor of information structure management as a file-card system where information is not casually inserted into the Common Ground, but each specific file-card is associated with a proper heading. In this sense, topic consists of the entities or the class of entities in which the new information established in the comments are stored between speaker and addressee. In line with this theory, each sentence can contain only one instance of aboutness topic. This hypothesis is assumed for the purpose of the following analysis. Indeed, several topics may occur in the same sentence, but only one can be counted as the topic about which the remaining proposition contributes new information.

Reinhart's (1981, 1982) study went a step further compared with previous literature on topicality, which addressed the investigation of the phenomenon from a philosophical perspective. In her analysis, however, she did not provide a clear-cut distinction between the syntactic and pragmatic features of topicality. Other analysis (Gundel 1988, 2003) better distinguished the properties of topicality by introducing a detailed analysis of these features. Gundel in particular (1988) established a much clearer definition between pragmatic topics and syntactic topics. Pragmatic topics are defined as follows:

> *(Pragmatic) Topic definition*: "An entity, E, is the topic of a sentence, S, iff in using S the speaker intends to increase the addressee's knowledge about, request information about, or otherwise get the addressee to act with respect to E."
>
> (Gundel 1988: 210).

On the other hand, a syntactic topic is that expression "which refers to the topic and which occupies a syntactic position reserved for topic" (Gundel 1988:211). A syntactic topic always coincides with a pragmatic topic, while this association is not guaranteed for the vice versa relationship. Indeed, a pragmatic topic is not always syntactically codified, and sometimes, depending on the linguistic context, the pragmatic topic may also be omitted.

Gundel (1988) also shed light on the interpretations of the interaction between givenness/newness elements by distinguishing three distinct senses of topic: a relational sense, where topics are considered in opposition to the new part of the sentence (the comment) and vice versa, and two referential senses, where the informational status of a

linguistic expression is considered in relation to the cognitive condition of the speaker or addressee.

More specifically, the relational sense is defined in a logical-semantic sense, such as the subject-predicate relationship, or in a more conceptual/phsychological/cognitive sense, such as the introduction of an entity in the mental storage of the hearer, in line with Reinhart's file-card metaphor. Studies were carried out by Chomsky (1971) and Jackendoff (1972) regarding the related concepts of presupposition and focus, as well as by Kuno (1972) and Vallduví (1992) about the binomial notion of theme-rheme, and are based on the pragmatic definition of topic already proposed above.

On the contrary, in the two referential interpretations, topics are conceived as the relationship between «a linguistic expression and the corresponding non-linguistic (conceptual) entity in (the model of) the speaker/hearer's mind» (Gundel 2003:125). This aspect is addressed in those studies that describe the assumed familiarity of a referent (Prince 1981). In line with the first referential perspective, topicality is interpreted in terms of given knowledge, therefore an expression is considered as given when both speaker and hearer are already familiar with it or already have a common knowledge of the element under discussion. In this sense, topics are defined in terms of a familiarity condition:

> *Topic-Familiarity Condition*: "An entity, E, can successfully serve as a topic, T, iff both speaker and addressee have previous knowledge of or familiarity with E."
>
> (Gundel 1988:212)

The second referential interpretation pertains to the level of activation of a specific referent. This interpretation introduces a further distinction, where the familiarity condition of an entity is no longer enough. What is relevant here is that the speaker and the hearer are both thinking about a referent at the moment of utterance. This additional parameter of topicality concerns those studies which relate to the accessibility scale and the level of retrievability (Ariel 1988), and the conceptualization of active and identifiability of referents (Chafe 1976, Lambrecht 1994). Further details about this second sense of referential interpretation are offered in § 2.2.4.

Syntactically, Gundel (1988) identified specific formal structures which mostly display sentence-initial topics. Similar structures have been differentiated as (i) left dislocation constructions, when the sentence contains a pronominal form or a clitic which is co-referential to the left-dislocated topic expression, (ii) a topic adjoined to the initial part of the sentence which is responsible for a double-subject effect, but does not display any syntactical co-referentiality, and (iii) a topicalized expression co-adjoined to

the left part of the sentence and linked to the sentence by a co-indexical gap. An example for the three structures is reported below in (12a), (12b) and (12c).

(12)

a. Die frau da, sie kommt aus Berlin.
the woman there she comes from Berlin
'The woman there, she comes from Berlin'

(German, Gundel 1988: 224, ex. 34)

b. 'My work, I am going crazy'

(English, Gundel 1988: 224, ex. 35)

c. ánà nya làthyu khù-a
dog top people bit
'The dog, they bite people'

(Hebrew, Gundel 1988: 224, ex. 38)

The cross-linguistic variation concerning the placement of topic expressions before or after the comment is summarized by Gundel (1988) in two principles: The Given before New Principle, which states that given is placed before what is new in order to introduce it, and the First Thing First Principle, which claims that the most important information is provided first. There are situations in which the two principles converge, for example when the topic is reintroduced after a while or when it is in contrast with a previously mentioned item, as in contrastive structures, left dislocation constructions or topicalization phenomena. In other cases, the principles conflict and language might solve this conflict in a contrary manner, that is, by prefacing the new information with a given element or by positioning the comment as the first expression.

Despite the placement of a topic within the sentence, Lambrecht (1994) suggested the crucial relevance of the linguistic context in order to distinguish between the aboutness topic and a more general topic. In particular, it is important to "know whether the proposition expressed in this sentence is to be pragmatically construed as being about" the entity in discussion (Lambrecht 1994:120). Therefore, in a sentence like "The children went to school", which answers a question like "What did the children do next?" (Lambrecht 1994:121, ex. 4.2.a), it is possible to claim that the topic 'the children' fulfils the function of being the aboutness of the sentence, because the statement is constructed around the topic expression 'the children'. Based on Reinhart's (1982) study, Lambrecht (1994) characterized topics and topic expressions are defined as follows:

> *Topic*: "A referent is interpreted as the topic of a proposition if in a given situation the proposition is construed as being about this referent, i.e. as expressing information which is relevant to and which increases the addressee's knowledge of this referent".
>
> *Topic Expression*: "A constituent is a topic expression if the proposition expressed by the clause with which it is associated is pragmatically construed as being about the referent of this constituent."
>
> Lambrecht (1994:131)

In this sense, also in line with Reinhart (1982), the aboutness topic relation expresses the pragmatic relation between a referent and the proposition where this referent is contained with respect to a specific discourse context. Therefore, the aboutness topic may be conceived as a sentence relation which is pragmatically structured.

Sentences without aboutness topics do exist, for example identificational sentences where the nominal constituent identifies a missing argument and is also a referring expression, such as in the following sentence:

(13) "The ones who did that are my FRIENDS"

(Lambrecht 1994: 123, ex. 4.3a)

Other sentences which lack the aboutness topic elements are event-reporting sentences, where the whole sentence has the function of informing the interlocutor about an event, as in the sentence:

(14) "THE CHILDREN went to SCHOOL!"

(Lambrecht 1994: 121, 4.2c)

In the above sentences, the focus spreads over the entire proposition, therefore these constructions lack any type of topicality. For further information about sentences which were excluded from the analysis, see § 3.3.3.2.

2.2.1.2 Pragmatic aspects of scene-setting topics in spoken languages

Although the majority of studies on topicality focus primarily on aboutness topics, topics with other pragmatic functions have been considered by scholars in the literature. Among the other types, scene-setting topics are part of the linguistic debate on topicality.

In the past, scene-setting topics were defined as topic expressions which "limit the applicability of the main predication to a certain restricted domain" and "set a spatial, temporal, or individual framework within which the main predication holds" (Chafe 1976:50). An example of a scene-setting topic is displayed below:

(15) Körpelich geht es Peter gut.
Physically goes expl. $P._{dat}$ well
'Physically, Peter is well'.

(Jacobs, 2011:655, ex. 24)

The existence of such a type of topic has been questioned by linguists, and the attribution of this category to topichood is not unanimously recognized in the literature. Indeed, unlike aboutness topics, which are more or less univocally identified as the old and given part of the information, scene-setting topics do not present a clear-cut given nature and may also be introduced into the sentence as new information. However, because of their specific role to set a background against which the remaining part of the sentence may be interpreted, these elements seem to share many pragmatic functions with more prototypical topics.

These specific elements were commonly classified as linguistic features of topic-prominent languages such as Mandarin, as analysed by Li and Thomson (1976). In this typology of languages, topic-comment sentence structures prevail, contrary to subject-prominent languages where subjects, instead of topics, fulfil a prominent role. For some scholars (Li, Thompson 1976), these constructions have been translated with the English formula 'as for', but Chafe (1976) disagreed with such a misleading expression, above all because in his work the "as for" use seems mostly to fulfil a contrastive role. Rather, he conceived these constructions as temporal or spatial adverbial expressions establishing the frame within which the main sentence is situated. (Chafe 1976).

In addressing the scene-setting topic phenomenon, Jacobs (2001) attempted to combine the topic-comment relation with a prototypical model. Under his hypothesis, spatial and temporal adverbial expressions display some common properties with the prototypical notion of topicality. Indeed, they appear as informationally divided by the remaining part of the sentence, and in some languages, such as in Modern German, they also seem to be left-dislocated in the structure, similarly to aboutness topics. In line with this study, frame-setter topics are defined as follows:

> *Frame-setting*: "In (X, Y), X is the frame for Y iff X specifies a domain of (possible) reality to which the proposition expressed by Y is restricted."
>
> (Jacobs 2001:656)

Although scholars in the past have treated scene-setting topics as generic instances of aboutness topics, scene-setting elements differ from aboutness topics in terms of their Truth Conditions. Indeed, the information conveyed by scene-setting topics is crucial for the interpretation of the sentence and has scope over the Truth Condition of the whole utterance. In contrast, aboutness topics only conveying presupposition information do not affect the Truth Condition of the sentence. However, in line with Jacobs' (2001) analysis, scene-setting topics are also similar to aboutness topics (which are defined as *addressation topics* in his theory). In fact, both of these topic types present common features, such as the function of establishing a background towards which the information carried out by the proposition is conveyed.

Furthermore, scene-setting topics are expressions that provide general information about an individual and that "systematically restrict the language (the notion that can be expressed) in certain ways" (Krifka 2008:269). This means that these types of topic cast their scope over the entire sentence, reducing or channelling its interpretation. Since they seem to "choose one out of a set of frames and state that the proposition holds within this frame" (Krifka 2008:269), they also appear to share properties with focus expressions or contrastive topics. By observing this ambiguous status, Krifka highlighted the difficulty of clearly codifying such entities into a specific category. Based on this assumption, some scholars hypothesized on the mixed nature of scene-setting topics as expressions holding both focus and topic (Fery, Krifka 2008).

The evident similarity in the pragmatic properties common to scene-setting topics, aboutness topics, and contrastive topics seems to demonstrate the topic nature of such debated expressions.

2.2.1.3 Pragmatic aspects of contrastive topics in spoken languages

Another type of addressed topic expresses a contrastive function. Likescene-setting topics, contrastive topics are expressions which are debated among scholars with respect to their misleading pragmatic and syntactic nature. Indeed, even though these topics are given entities, because they fulfil a contrastive role, they also share common properties with focality.

In the past, the concept of contrastiveness often neglected the distinction between topic and focus properties, as in Chafe (1976). Analysing an English topicalization structure, such as the one displayed in the example (13) below, he claimed that the topic is in this case a "focus of contrast that has for same reason been placed in the unusual position at the beginning of the sentence" (Chafe, 1976:49):

(16) THE PLAY John saw yesterday.

(Chafe 1976:49, ex 13)

However, the focus of contrast in Chafe's framework does not equally correspond to the new information, and this makes the terminological confusion of such an analysis more widespread. Moreover, no linguistic consensus has been reached among scholars about these types of expression. For example, in Prince (1981), similar entities have been explained as focus expressions, and the heterogeneous literature increases the impossibility of finding a clear-cut definition of these types of constituents. Chafe (1976) introduced three identificational criteria for defining contrastive topics: (i) a shared background knowledge, (ii) a set of possible alternatives, such as a play, a movie or, an opera (such as in (16) above), and (iii) the assertion of which candidate is the correct one. However, no previous contexts were provided in order to better establish the context of these contrastive items, and only postulations of possible contexts were proposed in analysing the structure.

Developing these open-ended investigations, Lambrecht (1994) was able to observe in his analysis of aboutness topic that a certain left dislocation may display contrastive meaning in specific language registers, such as standard French, and may be neutral in others, like non-standard varieties of French. Moreover, he also pointed out how some detached constructions to the left of the sentence are used to reactivate a topic which was non-prominent in the addressee's mind. Developing these observations, Lambrecht

(1994) concluded that detached elements may convey contrastive meanings, trying to mark a shift in the attention from an active element to a non-active one.

Detachment constructions are common in many of the world's different languages, and sometimes the reintroduced topic expression may be accompanied by specific linguistic formula, such as the "as for NP" in English or "quant à NP" in French. Usually, the lexical extra-clausal NP is resumed or co-indexed to a pronominal expression within the proposition.

However, these structures are not considered prototypically as expressions of contrastiveness; rather, Lambrecht (1994) classified cases of contrastive topics in which two or more arguments weave a contrastive relationship with each other as prototypical. A similar case is reported below:

> (17) I saw Mary and John yesterday. SHE says HELLO, but HE's still ANGRY at you.
>
> (Lambrecht 1994: 291, ex. 3.20b)

According to the assumptions Lambrecht (1994) made about contrastive topics, the pronominal contrastive expressions displayed above (SHE and HE) contrasted each other, but, unlike a contrastive focus, they do not show the function of contradicting or correcting other entities. Indeed, since contradiction or correction functions entail negation, these pragmatic functions cannot pertain to topicality, because topics are outside the scope of negation in the theory assumed here by Lambrecht (1994). Despite this difference, he supposed that some protheoretical concept of contrast may apply to both topic and focus expressions.

Recently, the term contrastive topic has been used among scholars to refer to two main macro-interpretations which are linked to the ways in which the category of topicality and contrastiveness are defined. The first is represented by researchers such as Krifka (2008): the term is conceived compositionally as a topic expression which contrasts, also described as delimitation. This sense may be considered as the narrow interpretation of contrastive topic. In the second trend of studies, scholars such as Büring (2003) and Tomioka (2010) consider contrastive topics independently from any notion of topicality. This approach is more inclusive and conceives of contrastive topic as a larger group of expressions within which only partial overlapping with aboutness topics that have a contrastive meaning is possible.

In line with the first approach, contrastive topics appear to be composed from an aboutness topic containing a focus (Krifka 2008), as displayed in the example (18) below. Contrastive constructions like these have also been defined in the literature as pair-list questions (Büring 2003, van Hoof 2003) or as List Interpretation (LI) (Benincà & Poletto 2004), and despite the terminological differences, they constitute narrow instances of contrastive topics.

(18)

A: What do your siblings do?

B: [My[SISther]$_{Foc}$]$_{Top}$ [studies MEDicine]$_{Foc}$, and [my [BROther]$_{Foc}$]$_{Top}$ is [working in a FREIGHT ship]$_{Foc}$

(readapted by Krifka 2008:268, example 44)

The presence of the internal focus (sister) established a set of other alternatives (brother) by relating these alternatives to the aboutness topic. The outlined item indicates that not all the expected information has been provided in the present clause. In line with this interpretation, it is possible to account for contrastive topics as linguistic strategies for incrementing the shared knowledge in the common ground, by further subdividing the issue into sub-issues. However, not all the sentences may be explained with this interpretation. There are some sentences, such as the one presented below in (19), which prove that such questioning-strategy models are not always appropriate.

(19)

A: Does your sister speak Portuguese?

B: [My [BROther]$_{Foc}$]$_{Top}$ [DOES]$_{Foc}$]$_{Comment}$

(Krifka 2008: 268, example 46)

In the sentence (19) above, the topic together with an increasing intonation of the focus element highlights that the assertion does not completely satisfy the communicative expectations.

Regarding the second broader sense of contrastive topics, some examples are reported below:

(20)

A. Can you play all these instruments?

B. I can play MOST of them…(I still haven't learned the trombone)

B'. I can't play ALL of them….(But I can play most)

B''. I can't PRETEND…

(Constant 2014:2, ex.5)

As displayed above, the entities presented as contrastive topics cannot be accounted for as aboutness topics conveying an additional contrastive meaning, but they mostly refer to contrastive entities. Büring (2016) also characterized contrastive topics in English as expressions accompanied by a rising pitch accent, which may stress that other alternatives were available at the moment of utterance.

For the purpose of the present analysis stressed on topicality notion, the first type of approach, namely the narrow one, is considered. Furthermore, as contrastiveness was only partially explored through elicitation in the present investigation, the debate about the nature of contrastive topics has been left aside.

2.2.2 Syntactic properties of sentence topics in spoken languages

In line with the syntax-driven approach carried out in cartographic studies, topic-comment relationships are placed in the Complementizer Phrase (CP) domain, holding dedicated positions with respect to their pragmatic and syntactic properties (Rizzi 1997, Benincà & Poletto 2004, Frascarelli & Hinterhölzl 2007). Before Rizzi's (1997) Split of CP, information structure components were placed in the vague and generic CP projection, without attributing a specific position for every single constituent. Further studies have started to increase the number of functional projections depending on the different syntactic properties of CP components, such as topics. Where previous research (Rizzi 1997) postulated the free recursion of topics in the left periphery of the structure, recent and more comprehensive studies (Benincà & Poletto 2004, Frascarelli & Hinterhölzl 2007, Giorgi 2015) have proved that topics occurring in different syntactic positions actually display different types of syntactic and semantic properties, making it possible to assume the existence of more specific projections for each type of topic analysed. However, the discussion is still open and other scholars (Cardinaletti 2016) have supported the research carried out by Rizzi (1997), confirming the free occurrence of topics before or after the focus position.

By considering these pieces of research, the following sections will provide an outline of the syntactic properties of different sentence topic types (§ 2.2.2.1) in order to understand which hierarchy holds true among all these elements in the left periphery of the sentence (§ 2.2.2.2), and to better understand the syntactic-moved or base-generated nature of some specific topic types (§ 2.2.2.3). Finally, the current section is meant to provide a syntactic framework for a broader analysis of topicality, by relating its formal properties to other pragmatic and prosodic features.

2.2.2.1 Types of topics

The degree of overlapping between the pragmatic and syntactic layers through which the different types of topic are categorized is far from clear. In particular, studies carried out in the past have often increased the terminological confusion, in their attempts to create more specific labels to rigorously define the multiple aspects of topics.
While too strict a partition of topics risks partial consideration of the complexity of topicality, a focalized analysis will in some instances capture a more detailed picture of the phenomenon.

From a syntactic point of view, topics have been cross-linguistically analysed depending on multiple factors, such as the relationship that these constituents exhibit with respect to the remaining part of the sentence, their nature as moved or base-generated topics, and their syntactic roles as arguments of the main proposition or as adverbial expressions. Moreover, topics may be realized through different linguistic strategies often related to communicative purposes and to the speaker's assumptions about the grade of accessibility of the topic referents. Syntactically, topics may also be omitted, if the context allows them to be easily retrieved. Therefore, more than one syntactic type of topic may be attributed to a specific pragmatic type of topic, as in the case of aboutness topics, which, as stated in the previous section, are defined as the given elements around which the proposition provides new information. This type of topic may be realized through several syntactic strategies, for example, it may be placed in the extreme left periphery of the sentence as a hanging topic, or it may be the default subject of a sentence as well, still keeping its pragmatic function as an aboutness topic. The next sections are intended to discuss some of these possible syntactic strategies in relation to the aforementioned pragmatic function of topics, in order to clarify correlations which have often been omitted or ignored by sector-specific studies in the literature.

2.2.2.1.1 Hanging topics as aboutness topics

Hanging topics are expressions which most often carry given information. However, in some cases, they may also be used for introducing new items into the discourse (Cinque 1990, Frascarelli 2000). Contrary to left-dislocated topics, hanging topics do not display the presence of any preposition accompanying the hanging constituent, as shown in the example (21) below, where the hanging topic is marked in bold.

(21) **Gianni**, Maria gli ha dato un bellissimo regalo.

Gianni, Maria to-him gave a beautiful present.

(Giorgi 2015:231, ex.3)

Since the absence of a preposition creates a double subject effect, hanging topics are also defined as *nominativus pendens* phenomena. Other factors reinforcing this suspension effect of a hanging topic are connected to the possibility for the hanging topic to be semantically integrated with the remaining part of the sentence, as displayed in the example (22) below. In such a case, the hanging topic only possesses a token relationship with the proposition.

(22) Vegetables, I like cauliflowers.

Indeed, the hanging topic constituent may be bound to the sentence by the presence of a clitic pronoun, a pronoun or an epithet fulfilling the function of resuming the hanging constituent, although, as displayed below, semantic relationships can also only occur between the hanging topic element and the sentence. Since examples (21) and (22) respectively display cases of clitic resumption and semantic relationship, the two examples (23) and (24) below present a case of pronominal and epithetical resumption:

(23) Gianni, hanno dato un bel voto persino a lui.
Gianni, they gave a good mark even to him.

(24) Gianni, hanno dato un bel voto persino a quel cretino.
Gianni, they gave a good mark even to that idiot.

(Giorgi 2015:231, ex.5-6)

Interestingly, in the case of the extreme left periphery, the syntactic properties of the core structure seem to be weakened in some way, and the lack of preposition in the hanging topic constituent may be a good example of how the syntactic relationship in this part of the structure is undermined.

Considering the order of these constituents with respect to other elements present in the leftmost periphery, it was observed by Giorgi (2015) that hanging topics (HT) must precede left-dislocated topics (LD) and cannot appear after a focus (FOC) item, as respectively demonstrated by the ungrammaticality of the two examples (25a) and (25b) below:

(25a) * Quel libro, Gianni, glielo hanno già comprato.

That book-LD, Gianni-HT, to-him-it (they)have already bought.

(Giorgi 2015:236, ex. 29)

(25b) *MARIO (non Paolo), Gianni gli darà un premio.
Mario, (not Paolo), Gianni to.him-CL will.give a prize.
Mario-FOC will give a prize to Gianni-HT

(Giorgi 2015:237, ex. 35)

Moreover, hanging topics cannot be embedded(their use is impossible in relative clauses), either before or after the Italian complementizer "che", as displayed by the ungrammaticality of the sentence (26a-b) below.

(26a)* Una persona mai,… che questo libro non ne parlerà
A person never,… that this book not of-it will-talk

(26b)* Una persona mai,… questo libro che non ne parlerà
A person never,… this book that not of-it will talk

(Benincà & Poletto 2004:19, ex.41a-b)

The analysis of such syntactic behaviour is useful in outlining the distribution of different topic constituents within a sentence, and is further addressed in § 2.2.2.2.
Further details about the syntactic nature of these constituents are provided in § 2.2.2.3 instead.

2.2.2.1.2 Left-dislocated constructions as aboutness topics

In contrast to hanging topics, left-dislocated topics only convey given information[13] (Frascarelli 2000) and are accompanied by a preposition which binds the topic constituent to the remaining part of the sentence.

[13] Many scholars in the past have disagreed with this interpretation of left-dislocated elements and have considered them to be linguistic strategies for introducing equally new arguments into the structure (Halliday 1967, Chafe 1976, Lambrecht 1994). In such studies, the term left dislocation is used to refer to completely new, reintroduced and given entities, without a clear distinction. Therefore, in order to avoid ambiguity, in the present analysis left-dislocated topics are always considered as given, in line with Benincà & Poletto (2004), Frascarelli & Hinterhölzl (2007), and Giorgi (2015). According to the analysis

(27) **A Gianni**, Maria gli ha dato un bellissimo regalo.
To Gianni, Maria to-him gave a beautiful present.

In the case of left-dislocated topics, also known as clitic left-dislocated topics (Cinque 1990), the topic constituent is resumed in the internal part of the sentence by a clitic pronoun or a pronominal expression.

Although the grammaticality of sentences like (28) below has been discussed, and some Italian speakers consider such sentences to be acceptable, in line with the account carried out by Benincà & Poletto (2004) and Giorgi (2015), left-dislocated topics (LD) need to foreground focus (FOC) items in order to avoid ungrammatical effects.

(28) *A GIANNI, un libro di poesie, lo regalerete.
To Gianni, a book of poems, you.will.give.it.
You will give a book of poems-FOC to Gianni-LD.
(Giorgi 2015:237, 37)

Unlike hanging topics, left-dislocated constructions may be embedded in relative clauses if the relative pronoun precedes the left-dislocated topic, as displayed in the example (29) below.

(29) Una persona che di questo libro non ne parlerà mai.
A person that of this book not of-it will talk never.
'A person who will never talk about this book'.
(Benincà & Poletto 2004:19, ex. 42a)

Further analysis about the distribution of topic items is carried out in § 2.2.2.2.
In some cases, left-dislocated topics may be considered pragmatically as aboutness topics, although previous studies have discussed these constructions as comparable to contrastive structures (Chafe 1976, Prince 1981). Further details about this account are provided in § 2.2.2.1.5.

The risk of directly attributing a pragmatic function to syntactic structures should nonetheless be acknowledged, since no direct relationship exists between the two layers.

adopted here, those elements which are not given and are still situated in a left peripherical position should be considered as located in a different syntactic position to that of a left-dislocated topic. In particular, not given elements which occur in the left periphery of the structure may be considered as an example of topicalization, bringing a new informational status and a different syntactic nature.

Relationships between formal structures and the informational status of constituents are far from being straightforward, and a caveat needs to be added in considering syntax as the only domain responsible for selecting topic expressions. Thus, for the purpose of the following study, pragmatics and syntactic aspects have been considered for the selection of aboutness topics in an attempt to avoid any a priori circularity.

2.2.2.1.3 Subjects as aboutness topics

Since the first studies on topicality, subjects have been considered as the prototypical topic element, in line with the topic-first principle (Firbas 1966). Indeed, many scholars (Li & Thompson 1976, Lambrecht 1994) have supported the hypothesis that since cross-linguistically subjects commonly come as the first elements in an unmarked word order, aboutness topics are likely to be realized as the subjects of the structure in a TOPIC-COMMENT order. Of course, such a hypothesis fails to explain verb-first language where the topic cannot be overlapped with the subject of the sentence.

However, as discussed in § 2.2.2.1.3, theories that have accounted for the existence of TOPIC-COMMENT and COMMENT-TOPIC structures have failed to consider the syntactic properties of sentence-final topics with respect to the properties of sentence-initial topics. More refined studies (Givón 1983, Frascarelli & Hinterölzl 2007) have better accounted for the syntactic and pragmatic properties of these topics by analysing them as different types of topics.

Although the other syntactic arguments of a sentence, such as objects, may fulfil the pragmatic aboutness function, a strong cross-linguistic correlation between subject and topics is recognized, especially in the absence of informationally marked structures, such as the presence of constituents in the left periphery of a sentence. In line with this tendency, subjects may be conceived as unmarked and prototypical topics. Certain exceptions to this tendency do exist and may depend on the lexical nature of some specific predicates, or on the semantic role played by the sentence subject, for example, experiential predicates which show non-agentive subjects, as well as passive constructions which may enhance the non-topical status of the subject.

In the following research, in the absence of any specific extra-sentential construction, such as hanging topics or left-dislocated topics, default subjects that refer to previously introduced entities have been considered as instances of aboutness topics.

2.2.2.1.4 Sentence-initial adverbial expressions as scene-setting topics

In line with the analysis carried out by Benincà and Poletto (2004), scene-setting adverbs are placed in a very high position within the left periphery of the sentence, even higher than left-dislocated topics. This is clearly visible in examples from the Rhaeto-Romance variety, as reported in (30) below.

(30) Duman va-al a Venezia.
Tomorrow goes-he to Venice.
'Tomorrow, he goes to Venice'.

(Benincà, Poletto 2004:20, example 43)

The scene-setting expression fulfils the role of establishing the framework within which the rest of the sentence holds. This may be the reason why these elements cannot be embedded, but occupy the first position in an utterance. By comparing scene-setting topics, hanging topics, and left-dislocated topics, which have been described above, Benincà & Poletto (2004) sketched a hierarchical distribution revealing that no other topic may be higher than hanging topics.

From their studies it becomes clear that since temporal adverbs (lower than hanging topics) are indistinguishable from left-dislocated temporal adverbs, the issue as to the specific identification of the syntactic nature of these adverbs is left unresolved. However, according to their analysis, despite the difficulty in identifying their formal condition, it is possible to point out that the subfield of topic must be further divided into the Frame subfield and the left-dislocated subfield, as better explained in § 2.2.2.2.

2.2.2.1.5 Syntactic properties of contrastive topics

In the literature, several scholars have analysed the syntactic features of contrastive topics (Frascarelli 2000, Frascarelli & Hinterhölzl 2007, Frascarelli & Bianchi 2010, Frascarelli 2011, Frascarelli 2012). According to their studies, contrastive topics are elements which "introduce alternatives in the discourse which have no impact on the Focus value and create oppositional pairs with respect to other topics" (Frascarelli 2012:181).

According to Büring (2003), contrastive topics instruct the hearer on how to correlate the asserted propositions to a questioning strategy, as displayed in sentence (31) below, where the contrastive topic expressions are marked in bold.

(31)

A. Come mai hai fatto due lingue, cioè, inglese e francese?

B. **Francese** l'ho fatto alle medie per tre anni con una professoressa con cui mi sono trovata benissimo […], **con l'inglese** mi sono trovata sempre a disagio.

A. Why did you study two languages, namely English and French?

B. **French** I have studied at school for three years with a professor that I liked a lot […], (while) **with English**, I never felt at ease.

(Frascarelli 2011:2, ex.3)

Contrastive topics pertain to the management layer of the common ground (CG), namely contrastive topic markings split a complex proposition into simpler sentential units which are related to each other. Furthermore, they are conceived as the answer to a question, which is part of a set of (explicitly or implicitly) expressed alternative questions, and all of these questions belong to a strategy to solve a super-question, as Büring (2003) summarized in his discourse-tree model in Figure (8)[14].

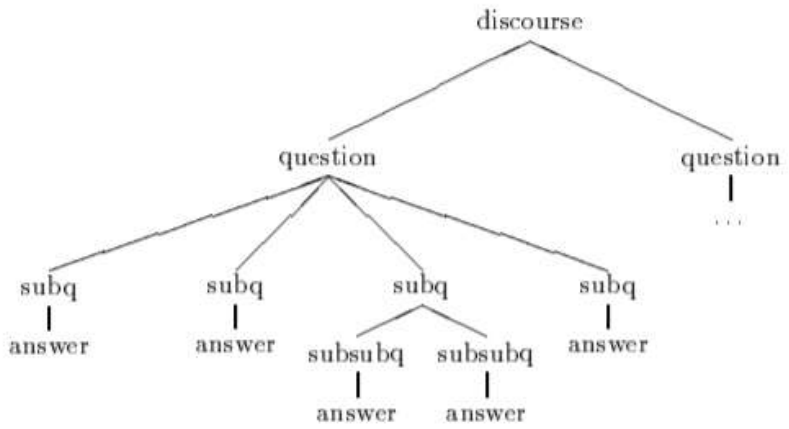


Figure 8. Discourse-tree model (Büring 2003)

(Büring 2003:4, ex. 6)

By analysing their corpus, Frascarelli & Hinterhölzl (2007) enhanced the hypothesis that contrast is not an inherent property of topics, but rather a functional feature licensed in the argumental position of the CP. They demonstrated this hypothesis by highlighting that contrastive focus and contrastive topics never occur together. Furthermore, the contrastive topic is different from the contrastive focus in terms of its quantificational

[14] An entire review of the model is beyond the scope of the current study, for further details about the theory formulated on contrastive topics the reader should refer to Büring 2003, Bianchi & Frascarelli 2010.

properties. Indeed, the contrastive focus singles out a variable and excludes other values, while the contrastive topic only requires opposition to other topics.

Furthermore, contrastive topics belong to the assertion present in the main proposition, therefore from a syntactic point of view they should remain under the scope of the assertion operator. This hypothesis, put forward by Bianchi and Frascarelli 2010, may justify the lower position occupied by contrastive topics with respect to the topic hierarchy. Further information about the syntactic distribution of topics is provided in the next section.

2.2.2.2 Distribution of sentence topics in spoken languages

Until the late seventies, those constituents which were related to the information structure were placed in the undefined and multi-faceted CP node. This node was targeted by several functional categories without a detailed subdivision. In 1977, Rizzi's Split of CP proposed the first categorization among these constituents. By observing Italian sentences, such as the three examples proposed below in (32a), (32b) and (32c), Rizzi reanalysed the CP node, splitting this generic and recursive phrase into an array of multiple projections, each dedicated to a specific information function.

(32)

(a) QUESTO, a Gianni, domani	gli	dovremmo	dire!
This-FOC, to Gianni, tomorrow,	[we] to.him	should	say

(b) A Gianni,	QUESTO,	domani	gli	dovremmo	dire.
To Gianni,	THIS	tomorrow	[we] to.him	should	say

(c) A Gianni,	domani,	QUESTO	gli	dovremmo	dire.
To Gianni,	tomorrow	THIS	[we] to.him	should	say

(adapted from Rizzi 1997:295, ex.37)

The generalization about the position of topic and focus which comes from his analysis is reported in (33). In this way, the CP domain fulfils the role of an interface domain between the proposition, namely the IP node and the discourse-related functions, such as interrogatives, focus and topic expressions, specification of force and finiteness.

(33) Force….Top*….Int(er)…Foc…Top*…Fin…

In so doing, topic elements are for the first time placed in their own dedicated position and are activated by the Force-Fin system. This system includes a unique position for focus and recursive positions for topic constituents. Indeed, observation of the Italian sentences suggests that in Italian topics positions are available both below and above the Focus projection. The asterisk above the topic phrase indicates its property of free recursion. However, more recent studies (Benincà, Poletto 2004, Frascarelli & Hinterhölzl 2007, Giorgi 2015) have accounted for a detailed distribution of the CP components in several functional projections. They analysed the syntactic properties and the functional features of topic elements and established dedicated topic projections insofar as the existence of such positions is semantically and syntactically justified. In agreement with the purpose of the cartographic program, such studies assume a direct relationship between form and function. As a consequence of this assumption, recursion of the same component in more than one functional projection is no longer allowed.

As described in detail in the previous sections about topic types (§ 2.2.2.1), by starting from the observation of the syntactic and pragmatic properties of hanging topics, scene-setting topics, and left-dislocated topics, Benincà and Poletto (2004) sketched a hierarchy which exemplifies their distribution in (34):

(34) [HT [Scene-setting Topics [LD Topics[List interpret [Focus Field]
| FRAME || THEME || FOCUS |

(adapted from Benincà & Poletto 2004:27, ex. 58)

According to their analysis, the left periphery which was split by Rizzi (1997) is further subdivided into dedicated projections and form different macro-areas.

Within this model, the topic field is grouped into two dimensions: the theme and the frame. Both layers share some properties with respect to the focus layer. Neither the theme nor the frame are bound to a variable in the clause (as the focus layer is) and both of them may convey shared knowledge. In particular, the Theme concerns those expressions which are retrievable in the immediate context, while the Frame includes elements which are already shared between the speaker and the addressee, but are not retrievable in the immediate context and defined as topics.

By taking a closer look into the topic subfields, it is possible to identify the topic constructions analysed in § 2.2.2.1. Starting from the constituent placed in the rightmost part of the topic field, Benincà & Poletto (2004) have singled out contrastive given elements, which they defined as List Interpretation. Indeed, these elements belong to an previously established set of entities and are contrasted with each other by means of

conjunction or adversative markers, which is a case of the broader phenomenon of contrastive topics according to the previously mentioned definition (Büring 2003, Frascarelli & Hinterhölzl 2007, Bianchi & Frascarelli 2010). According to the syntactic analysis carried out by Benincà & Poletto (2004), such elements follow left-dislocated constituents in the structure and both of them, together, are part of the macro-area defined as Theme. Scene-setting topics and hanging topics, given their broader application as frame-setter for the remaining part of the sentence, are instead placed in the leftmost area of the left periphery and belong to the macro-field of the Frame. Moreover, between them, hanging topics precede scene-setting topics in the structure, at least in line with the generalization which comes from the data analysed by Benincà & Poletto (2004).

It is important to note that, according to their results, it appears that a macro-pattern holds true in the syntactic management of information between speaker and interlocutor. In particular, the higher the position in the structure, the more information is shared between speaker and hearer. On the contrary, the lower the syntactic projection in the tree, the newer the information presented. In this context, Frame is higher than Theme, since it provides information about the broad topic and the spatial and temporal coordinates within which the proposition needs to be interpreted. Furthermore, such models seem not only to apply to the macro-sphere of Frame and Theme, but are also reflected in each domain. This analysis may demonstrate that the syntactic-pragmatic interface, also known as the left periphery of the sentence, is the area of the structure where pragmatic features are mostly codified by syntactic strategies. Again, in line with the generalization about the natural way through which communication exchanges proceed, givenness come first and newness follows it.

Aiming to establish a clearer distinction between the form and function of constituents belonging to the left periphery, Frascarelli and Hinterhölzl (2007) also reanalysed topic structure, differentiating the types of topics in term of their syntactic and prosodic properties. In particular, their analysis focused on three types of topic: aboutness topics (pragmatically shifted topics), familiar topics and contrastive topics, proving that each one of these topic types presents a different intonation contour and syntactic behaviour. The prosodic analysis of their study is discussed in § 2.2.3. The hierarchy they proposed after having analysed a natural corpus of data is presented in (35):

(35) Shifting Topic [+ aboutness] > Contrastive Topic > Familiar Topic
(Frascarelli, Hinterhölzl 2007:89, example 3)

The sketched hierarchies have the aim of providing a clearer picture of how information is managed between speaker and interlocutor, even though some small changes may occur cross-linguistically.

2.2.2.3 Syntactic nature of topics

Discussion ofthe moved or unmoved status of topic constituents was supported in the literature with different syntactic tools capable of detecting the semantic and syntactic consequences of movement operations, such as reconstruction effects, or weak/strong cross-over effects.
Scholars do not always agree on the analysis of the syntactic nature of topic constituents, and if hanging topics are likely to be homogeneously conceived as base-generated structures, the same does not hold true for left-dislocated constructions, especially with respect to the debated account provided to explain the nature of resumptive clitics and pronouns.

Giorgi's (2015) analysis proved that hanging topics (HT) are elements which are not sensitive to the generative diagnostic tools generally used to detect moved constituents, such as reconstruction effects. Consider the examples (36a) and (36b) below:

(36)
(a) Non ho regalato a lui molti fiori.
I did not give to him many flowers.

(b) Molti fiori, non li ho regalati a lui.
Many flowers-HT, I did not give them to him.

In the first sentence, "many flowers" is under the scope of negation, therefore the meaning is that "I gave to him few flowers". On the contrary in the second sentence, the hanging topic "many flowers" does not present any reconstruction effects which may attest that the constituent was under the scope of negation before being moved into the left periphery. In fact, the meaning of the second sentence remains unaltered, and paraphrasing the structure would mean that "many flowers exist that I did not give to him". Similarly, no reconstruction effects are displayed by the left-dislocated topics, supporting the hypothesis that these elements are probably generated *in situ* in the left periphery of the sentence.

Another syntactical diagnostic tool for movement which confirms the base-generated hypothesis is the fact that hanging topics do not trigger weak cross-over effects. Weak

cross-over is a test able to detect variable-operator structures. For this reason, if an element displays sensitivity to weak cross-over, it provides evidence that these type of linguistic expressions are moved from their original position, thereby creating a marginal effect of light ungrammaticality (Chomsky 1981).

Focus (FOC) placed in the left periphery, for example, which is commonly considered a moved constituent, is sensitive to weak cross-over effects, while, by contrast, hanging topics (HT) are not. Examples of both cases are respectively described in (37a) and (37b) below. The instance of focus is written in capital letters.

(37)

(a) * GIANNI$_i$, suo$_i$ padre ha licenziato t$_i$.
Gianni, his father has fired.
'Gianni's father fired Gianni-FOC'.

(Giorgi 2015:234, ex. 19)

(b) Gianni$_i$, LA CASA suo$_i$ padre gli$_i$ regalato.
Gianni, the house his father to.him-CL has given.
'Gianni's father gave the house-FOC to Gianni-HT'.

The fact that the hanging topic "Gianni" in the sentence (37b) is immune to weak cross over effects has led scholars (Benincà & Poletto 2004, Giorgi 2015) to generalize that no movement exists in the left periphery of the focus constituent.

As for left-dislocated topics, the debate is more complicated, since – at least for Italian - these elements must be syntactically resumed in the internal part of the proposition by means of clitic pronouns, or pronominal elements which take the number, gender and case of the left-dislocated constituent.

Past studies have thoroughly investigated and discussed the nature of clitic elements, and have tried to explain their function by considering the moved or un-moved condition of left-dislocated topic constructions. Indeed, assuming that the constituent detached in the left periphery was first generated inside the sentence, the clitic needs to be considered as a clitic doubling phenomenon or an instance of pronominal resumption, since the true argument is displaced. However, clitics can be defined neither as instances of doubling nor as resumptive strategies, at least in Italian, as in fact clitics cannot be doubled and they are not the spell-out of a moved phrase (Giorgi 2015). As such, left-dislocated topics are not explicable as moved constituents; rather

they should be conceived as base-generated elements, although some scholars disagree with this hypothesis (López 2009).

Similarly to hanging topics, it has been proven that left-dislocated constituents are not sensitive to weak cross-over effects, as displayed below in (38):

(38) Gianni, suo_i padre l'ha licenziato.
Gianni, his father him-fired.
'Gianni's father fired Gianni'.

(Benincà & Poletto 2004:, ex.9)

According to some studies (Samek-Lodovici 2008, Vermeulen 2007), they are not sensitive to strong islands, which are commonly used as a reliable test for movement operations, since the extraction of any constituent from the core of the embedded clause leads to a complete violation of syntactic rules and produces a strong ungrammatical effect. Therefore, strong islands, among other functions, are also used as tests to prove the base-generated nature of left-dislocated constituents. An example of a strong island is provided by the left-dislocated constituent 'Il progetto' in the Italian example (39).

(39) Il progetto, a MARIA abbiamo presentato una persona che lo conosce bene.
The project, to Mary-FOC (we) have introduced a person who it knows well.
'As for the project, we introduced a person who knows it very well to Mary'.

The analysis of the syntactic nature of topic constituents placed in the left periphery of the sentence is useful to better address the complexity of topichood, and to reflect on the distribution of these elements across languages, despite specific-language differences.

2.2.3 Prosodic features of sentence topics in spoken languages

Prosodic studies in the past have detected that languages which display intonation markers are also likely to put primary stress on the new informative part (Frascarelli 2000, Krahmer et al. 2002, Frascarelli & Hinterhölzl 2007, Krahmer & Swerts 2007). Therefore, the focus or the new information within the comment is prosodically prominent, while the givenness part is generally less marked, although topic constituents in some case may be prosodically separated from the remaining part of the sentence, and such separation may produce an effect of prominence. In pro-drop languages, given items which are also assumed by the speaker as very salient in the mind of the hearer can even be omitted in the sentence. (Gundel 1988, Fery & Krifka 2008).

The way in which prosodic connections are conveyed in different languages depends on the grammatical properties of each specific language. Indeed, as Féry & Krifka (2008) point out, intonation languages, such as English or Italian, mostly make use of pitch accent in marking focus expressions, while given elements are mostly de-accented. In several Asian and African languages, morphological and syntactic means are mostly used in place of pitch accents whose use is reduced, if not completely absent. In tone languages, the functions of pitch accent and boundary tones are respectively fulfilled by phrasing and particles.

In line with the generativist syntactic framework, certain studies of topicality (Frascarelli 2000, Frascarelli & Hinterhölzl 2007, Giorgi 2015) have tried to single out specific intonation contours which apply to the different syntactic and pragmatic types of topics. Pragmatic studies in the literature have discussed the correlation between the prosodic forms and functions of topic expressions (Féry 2006, Féry & Krifka 2008).

Other studies (Pierrehumbert & Hirschberg 1990), however, have claimed a different hypothesis, supporting the idea that intonational contours mark discourse function differently from the topic-comment distribution. They have proposed that the use of tones may be ascribed to a specific relationship between the propositional content and the reciprocal beliefs of the participants in the speech act, namely the conversational interaction. According to their model, accenting or de-accenting a constituent might be connected for example with the speaker's intention to highlight the saliency of the item. By contrast, boundary tones convey information about the continuation (or not) of the sentence. In this context, a H* boundary tone might signal that the sentence should be interpreted with a particular expectation of a following sentence.

Although interactions among different layers of communication are likely to arise in the form of prosodic signals, the current research focuses on the exploration of narrow correspondence between the different functional types of the old part of information and these prosodic tools.

2.2.3.1 Prosodic features of aboutness topics in spoken languages

Previous analyses about the prosody of topics (Frascarelli 2000, Frascarelli & Hinterhölzl 2007) observed that topics, in general, are exhaustively established in the Intonational (I) Domain. The Intonational Phrase is a phonological unit comprised of the lower Phonological (Φ) Phrase, which matches prosodic words and clitics in single prosodic units, and the higher utterance, which is a larger prosodic unit, composed of

several Intonational Phrases. Interestingly, a topic may be formed by more than one Phonological Phrase, and in this case, it always forms a separate Intonational Phrase. These types of prosodic constructions are prosodically defined as a *branching topic*, as illustrated by the example below in which the branching topic 'gli amici di Sara' consists of two phonological phrases combined in one intonational phrase and never restructured into the adjacent Intonational Phrase. In this case, a short break is present between the topic and the adjacent sentence:

(40) [[gli amici]$_{\Phi}$ [di Sara]$_{\Phi}$]$_{I}$ [[Gianni]$_{\Phi}$ [è partito]$_{\Phi}$
The friends of Sara Gianni be-3SG leave-PP
[senza neanche salutarli]$_{\Phi}$]$_{I}$
without even to say good-bye-to.them
'Gianni left without saying good-bye to Sara's friends.'
(adapted from Frascarelli 2000:47, es.73a)

On the other hand, when a topic is non-branching, as in the case of 'questo libro' in the example (41) below, it modifies its behaviour depending on the style or speed of speech. Generally, a separate Intonational Domain is formed with a short pause between the non-branching topic and the remaining Prosodic Phrase adjacent to it, as shown in (41) below.

(41) [[Questo libro] $_{\Phi}$]$_{I}$ [[conosco]$_{\Phi}$ [l'autore]$_{\Phi}$ [che l'ha scritto]$_{\Phi}$]$_{I}$
This book know-1SG the author that it have-3SG write-PP
'I know the author who wrote this book'.
(adapted from Frascarelli 2000:48, es.75a)

A non-branching topic may be prosodically restructured into the following topic constituent, at least if the topic units do not contain more than one Phonological Phrase, otherwise this is not possible. By contrast, branching topics cannot be restructured into a single larger Intonational Phrase. Such restructuring rules apply for Italian but are never mandatory at a cross-linguistic level, and mostly depend on stylistic variables of speech, such as the accuracy and rate of speech. These analyses do not specify the pragmatic characteristics of topics, but it is possible to assume their validity across the three types of topic analysed in the current research.

Further studies (Frascarelli & Hinterhölzl 2007) on topicality have investigated the prosodic contour of topics in relation to their syntactic and pragmatic properties and have discovered a correlation between form and function. In their analysis, aboutness topics were analysed according to Reinhart (1981) and Lambrecht (1994), but such

topics were defineded as shift, that is topics newly introduced into the discourse. By contrast, the aboutness topics which are mentioned in a discourse in a continuous manner are defined in their study as familiar topics, even though they are assigned an aboutness topic feature, in the fashion of a combined model. In both Italian and German, these topic types seem to be accompanied by particular intonation contours. By analysing a corpus of spoken data, they noticed that every time a topic was reintroduced into the discourse it was marked "by a rise in the F0 contour that is aligned with the tonic vowel in its full extension and reaches its peak on the post-tonic syllable". Such intonation contours are identified by the complex tone L*+H[15]. An example of a similar type of topic is presented in (42) below, where the shifted aboutness topic is highlighted in bold:

(42) Il materiale era tantissimo quindi all'inizio l'ho fatto tutto di corsa cercando di impiegarci il tempo che dicevate voi magari facendolo un po' superficialmente pur di prendere tutto- **l'ultima unit** la sto facendo l'ho lasciata un po' da parte perché ho ricominciato il ripasso….
"The material was quite a lot, so at the beginning I did it in a rush, trying to do it all in the time that you had fixed, maybe a little superficially, so as to do everything- I am doing **the last unit** now, I put it aside before because I had started to go through the program again…".

(Frascarelli & Hinterhölzl 2007:91, ex. 4)

The aboutness topic shift in the example is "the last unit" and it marks a change in discourse. Moreover, the topic forms an autonomous intonation phrase in the discourse. By contrast, according to their analysis, familiar topics are accompanied by an L* tone and are entities which are already part of the shared information. Such topics may be found in the rightmost part of the sentence since they represent a repetition of a salient referent, as in the example displayed in (43):

(43) […] A: comunque quelle domande ti davano la conferma di ricordare tutto insomma; B: ma…magari non me la- non riesco a darmela da sola **la conferma**.
A: "however those questions gave you the possibility to check your understanding". B: "well, maybe I cannot make **this check** on my own".

(Frascarelli & Hinterhölzl 2007:93, ex. 6)

[15] In the Pierrehumbert system of intonational contours, tunes are considered as sequences of low (L) and high (H) tones, which change and form the shape of F_0 contour. In English, six combinations of pitch accents have been detected: two simple tones (high and low) and four combinations of complex prosodic units. When the pitch accent marks a simple tone, it is described with a star upon the indication of tone, such as H* and L*. The four complex units appear as a combination of a pitch accent with two tones: L*+H, L+H*, H*+L, H+L*.

However, these types of syntactically right-hand familiar topics are not considered in the current analysis, and continued topics, along with shifted topics, are conceived as aboutness topics.

Like Frascarelli and Hinterhölzl (2007), Giorgi (2015) proposed an account of two syntactic types of topic: left-dislocated topics and hanging topics trying to combine their position with strong intonation patterns. Previous analyses (Rizzi 1997, Frascarelli and Hinterhölzl 2007) have justified the moved or base-generated syntactic nature of constituents in the left periphery with the presence of specific features, such as a hanging topic [+HT] or topicalization [+top], which match the features of the head which already exists in the relevant position of the structure. However, accounts such as these do not consider the role of discourse constraints, which also seem to play important functions. For this reason, Giorgi (2015) proposed a prosody-oriented head which hosts the projections of hanging topic and clitic left dislocation (CLLD). In so doing, she overcame the idea regarding features which are carried out by items in order to match the features of the syntactic heads. This hypothesis might explain the relationships of these topic constituents with the discourse, as well as the intonation contours which are triggered by specific contextual conditions.

2.2.3.2 Prosodic features of scene-setting topics in spoken languages

Prosodically, sentences with scene-setting topic constructions in the literature have been treated as instances of generic topics (see Rizzi 1997) or aboutness topic structures, as displayed in the example (32b) repeated below as (44), in which the item 'tomorrow' was labelled as topic, but according to the current research should be attributed to the scene-setting (SST) category of topics.

(44) A Gianni, QUESTO, **domani**, gli dovrete dire!
To Gianni, this-FOC, **tomorrow**-SST, you should tell him.
(adapted from Rizzi 1997:291, ex. 23)

Scene-setting topics, like the other type of topic constructions, might be prosodically separated from the remaining part of the sentence by means of a pause, forming its own independent intonation phrase. This is also displayed in the example below:

(45) [**In quella città**]$_{I}$ [[Marco]$_{\Phi}$ [non ci torna più]$_{\Phi}$]$_{I}$

In that city, Marco is not going back there.

2.2.3.3 Prosodic features of contrastive topics in spoken languages

Focusing on the prosodic aspects, we can see that contrastive topics are not de-accented in Italian in the same way that generally given items are. Rather, they appear to be prominent and correlate with high pitch accent (H*), similarly to focus items (Frascarelli & Hinterhölzl 2007, Bianchi & Frascarelli 2010). Although the intonational contour accompanying contrastive topic items is followed by a low boundary tone, in such analyses the alignment differs from the L+H* contour associated with aboutness topics. Indeed, in contrastive items the pitch accent is not reached in the post-tonic vowel as it is in aboutness topics, but rather it extends over the whole tonic vowel, as shown in the sentence (46) below (again the item in focus is marked in bold):

(46) […] **in inglese** ho avuto sempre problemi con i professori.
'**In English** I always had problems with professors.'
(Frascarelli & Hinterhölzl 2007:92, ex. 5)

Cross-linguistically, however, variations are possible in the prosodic analysis of such specific types of topics. Both this and other pieces of research (Frascarelli & Hinterhölzl 2007, Wagner 2008) have highlighted that in English and German contrastive topics involve a rising pitch accent commonly described as an L+H* contour, which is exactly the same contour used in other studies for defying aboutness topics. An example is presented in (47) below:

(47) dass er [Shäuble] sagt er hat das geld bekommen und hat es der Schatzmeisterin Baumeister gegeben **während Schreiber** sagt her hat es der Schatzmeisterin äh Brigitte Baumester gegeben un Schäuble sagt jetzt…
'That he says he has received the money and has given it to the treasurer Mrs Baumeister **while Schreiber** says he has given it to the treasurer – Brigitte Baumeister and Schäuble now says…'
(Frascarelli & Hinterhölzl 2007:105, ex. 24)

Therefore, contrastive items crucially differ with respect to the association of these constructions with contrastive foci, as in Italian, or with familiar topics, as in German and English.

Huge prosodic differences such as these have been explained in terms of morpho-syntactic cues, and indeed, since Italian contrastive topics dispose of the presence of

resumptive clitic pronouns in order to differentiate them from contrastive foci, it is possible that languages such as English and German use a prosodic strategy for this distinction because of a lack of morpho-syntactic tools.

However, as already pointed out in the previous chapter, the classification of topic elements is not always clear-cut and overlaps between the pragmatic and syntactic functions may arise, making the differentiation of such constructions quite difficult.

2.2.4 Referential expressions and referential hierarchy in spoken languages

The notion of givenness as being the information assumed by the speaker to be in the mental storage of the hearer at the time of the pronounced utterance (Chafe 1976) is slightly different from that of old information, which implies that the speaker assumes some knowledge already to be in the mind of his interlocutor. Indeed, according to this definition, familiar expressions, such as 'your father' or 'your mother', should never be presented as new information in a discourse, since the hearer is always assumed to have previous knowledge about his parents. Such temporal restrictions therefore limit the applicability of the givenness at the very moment of the utterance with respect to the activation of those referents in the specific context shared by the interlocutors (Chafe 1976, Lambrecht 1994).

In a communicative exchange, morpho-syntactic and prosodic strategies may be used by the speaker to encode the assumed informational status of the pronounced referent. Cross-linguistically, these language-specific tools may vary, depending, for example, on the presence of definiteness or indefiniteness markers, or on the wide spectrum of possible syntactic categorizations of a referent, such as the existence of pronominal expressions or clitic expressions, or the drop of the subject. Even though there is no straightforward correspondence between the syntactic and prosodic forms, and the established pragmatic status of a referent is detectable, the possibility of universal alignment between these elements is a topic which is still under investigation by scholars (Prince 1988, Ariel 1990, Givón 2016).

The following sections will outline the properties of some of the categorical structures available to the speaker in a cross-linguistic perspective. Definite descriptions are addressed in § 2.2.4.1.1, while pronominal expressions and analysis of the appropriate contexts for such elements are presented in § 2.2.4.1.2. Null arguments in pro-drop spoken languages with consequent licensing conditions are tackled in § 2.2.4.1.3.

Importantly, the notion of definiteness is strictly related to topicality. According to Chafe (1976), the process of categorization relates to the identifiability of a certain reference. Cross-linguistically, this definite status may be expressed in different ways, such as throughthe use of articles or demonstratives accompanying the nominal expressions. Further details about the relationship between definiteness and topicality are provided in § 2.2.4.1.4.
Finally, § 2.2.4.2 focuses on the possible existence of a universal scalar range where referential expressions are ranked depending on their higher or lower level of accessibility, which is defined in terms of the informative load these elements may encode. Again, this notion is closely related to the newness or givenness status of an element in the discourse, and to the assumption that the speaker automatically makes about the hearer's knowledge.

One of the most common criteria for considering the speaker's assumption about the hearer's knowledge as being reliable is based on the first new mention of a reference. When the same entity is reintroduced into the discussion after a while it is considered as given. However, the issue is far from simple; indeed, according to some scholars (Chafe 1976) generic classes of referents could be considered as given if one member of the class was previously introduced into the discourse. This is the case for class-related topics. For example, an antecedent speech about a previous earthquake allows the speaker and the hearer to make reference to other earthquakes, defining them as given as well, because they are part of the same class of referents. Similarly, generic nouns convey givenness if they are reintroduced after a new specific mention of the same class, for example in the sentence:

(48) I bought a painting (new) last week, I really like painting (generic and given).
(Chafe 1976:32)

Interestingly, it is reasonable to wonder how long this status of givenness lasts, and how far (in terms of the number of utterances pronounced) the notion of *recoverability*, namely, the possibility for the hearer to recover certain previously mention items, can be considered.

Indeed, the fact that the givenness status of a referent is assumed by the speaker makes a miscalculation of the hearer's capacity to recover the previously referenced item possible. Distance between a previously mentioned item's position and its reintroduction into the discourse is not the only reasons for such miscalculations . In fact, as sentences enumerate, given competitors could also make a previously

introduced referent less recoverable for the hearer. Attempts to calculate such distances have sought to account for the number of sentences which elapse between the last mention and the reintroduction of the referent, or the change of scene, which may have a string effect in discourse boundaries.

The establishment of scalar criteria to reflect the range of recoverability of referents used by the hearer should be useful, but according to some studies (Chafe 1976), no reliable distinctions have been made for describing these psychological grades of human mental storage. However, other research (Ariel 1990, Givón 2016) has pointed out how such a calculation is possible, using several different criteria.

In line with these theories, the current study aims to correlate different types of analytic tools in order to detect how specific pragmatic factors may affect the syntactic and prosodic choices of both speaker and hearer (further information is provided in § 3.4.3).

2.2.4.1 Referential expressions in Spoken Languages

Referential expressions are linguistic structures which fulfil the pragmatic function of reflecting the assumption that a speaker makes in terms of how easily the referent may be retrieved by the addressee. In this sense, referential expressions are markers of accessibility. Every language displays a range of referential expressions, their purpose is to provide information about the informational status of the referent and the cognitive position that it referent occupies in the mind of the interlocutor. In the literature on topics, the grade of retrievability is often conceived with respect to the accessibility of a referent (Ariel 1988, 1991). The more a referent is considered accessible in the mind of the addressee, the less phonological material is used by the speaker to encode the referent. Indeed, a referent is highly accessible if it is considered salient and already activated in the mental archive of the interlocutor. Therefore, communicative exchanges require coordination between the speaker and interlocutor, and a mismatched condition leads the discourse to reciprocal ambiguity. Imagine, for example, a situation where two people are talking in the street, one in front of the other, and one of them says out of the blue “I saw them before”. The interlocutor may wonder to whom the speaker is referring, since no previous introduction of the pronominalized entity has been made. Perhaps the speaker saw another person passing by in the street, who was not visible to the interlocutor.

Thus, generally speaking, it is possible to claim that the choice of the syntactical encoding of a referent can be attributed to the grade of accessibility the speaker assumes about that reference. Indeed, definite descriptions such as full noun phrases or bare

nouns presume that the speaker needs to produce the referential expressions more clearly, in order to make retrieval easier for the addressee. Conversely, the omission of the reference implies that a high level of accessibility is assumed by the speaker. Pronominal and demonstrative expressions are in the middle of this scalar range of linguistic strategies, since they presuppose a reference to an element which is already active and familiar between the speaker and interlocutor, but these elements may not be highly salient, unlike those elements which may be omitted.

The following sections address the syntactic realizations of aboutness topics that have been considered in the current study: the occurrence of determiner phrases (§ 2.2.4.1.1), pronominal expressions (§ 2.2.4.1.2), and the context in which arguments can be omitted given their prominent status (§ 2.2.4.1.3).

2.2.4.1.1 Nominal Phrases (NP) and Determiner Phrases (DP) in spoken languages

Nominal Phrases (NP) in spoken languages are constituents whose main item consists of a noun. Such elements determine the agreement and syntactic function of the whole phrase. In line with many studies in a variety of linguistic theoretical approaches (Abney 1986, Radford 1993, Giorgi & Longobardi 1991, Cinque 1994 and many others for the generative framework, Hewson 1991 for the cognitive framework), similarly to clauses which contain a VP shell, nominal structures are analysed as composed of an NP shell. Indeed, above the NP shell there could be several different functional projections expressing abstract syntactic features, such as person, number, gender, and definiteness. In this spirit, NPs may be taken as a complement within bigger phrases and headed by Determiner Phrases (DPs). The syntactic functions of DPs are assigned by verbal value. These structures are meant to be headed by a determiner, even when the determiner item is realized as an empty category. The term NP continues to be used in reference to the specific NP projection within the broad nominal structure.

The types of determiner may vary according to the language-specific strategies available for each language, it may be an article, such as ‘the little girl’, a demonstrative, such as ‘this girl’, a possessive adjective, such as ‘his father’, or a numeral and quantifier expression, such as ‘the second girl on the right’ or ‘all the boys’.

Determinant elements are informationally rich and may codify a topical referent specifying its status. DPs are therefore expected to be used by the speaker in contexts

where the informational status of the encoded referent is less accessible and needs to be more clearly indicated in the discourse (Ariel 1991, Givón 2016). Similar codification may be used in those contexts where the referent is reintroduced after a certain distance from the antecedent or after the presence of many referential competitors (Ariel 1991).

2.2.4.1.2 Pronouns in spoken languages

Pronouns are linguistic expressions that languages use to substitute or to refer to other NPs or DPs. Pronouns can mark the person, number and gender of a referent and, in several languages, they can also mark the grammatical function, or the case, of the nominal expression that they refer to. Other functions which can be encoded by the pronominal items are politeness or the inclusiveness vs. exclusiveness of the addressee. Different types of pronouns have been identified and they may vary cross-linguistically. The sub-categories are: personal and possessive pronouns, reflexive and reciprocal pronouns, and demonstrative, relative and interrogative pronouns. In natural languages, linguistic studies in the past (see Kayne 1974; Cardinaletti & Starke 1999) have identified three different classes of personal pronouns: strong, weak and clitic. These types of pronouns are respectively shown in the examples (49a), (49b), and (49c) below:

(49) (a) Ieri ho visto Paolo, solo **lui** è venuto alla festa.
'Yesterday I saw Paolo, only he has come to the party'.

(b) Ho consegnato **loro** un pacco.
'I gave them a box'.

(c) **Gli** ho consegnato un pacco.
'I gave them a box'.

Strong pronouns are characterized by the potential of occupying a thematic position. They can be focalized and coordinated because they share the same distribution of DPs and present a strong referentiality (Cardinaletti & Starke 1999). These pronouns can also be realized without an antecedent reference, for example if they are deictic. Moreover, these pronouns have an accent and are morphologically complex. The other two classes of pronouns occupy derived positions and are always anaphoric. Weak pronouns could have an accent, but they are morphologically reduced. The clitic pronouns, as opposed to weak pronouns, cannot be divided from the verb by any kind of modifiers and are monosyllabic, without accents.

Pronominal expressions, however, may also fulfil anaphoric functions, encoding given references. In this case, the pronoun refers to a previous NP or DP expression which is commonly defined as the antecedent of the anaphoric item. Generally speaking, in a communicative exchange these types of pronouns are used by the speaker for reasons of economy, in order to avoid continuous repetitions of the same nominal expressions which would make the conversation much denser in terms of information. Indeed, this is well captured by one of Grice's maxims of quantity, which states that the communicative contribution should not be more informative than required. However, exceptions may be made by the speaker in order to avoid ambiguous interpretations by the hearer. Indeed, in a discourse, the presence of multiple competitor referents could make the resolution of a pronominal reference ambiguous for the hearer. In these cases, the speaker may choose to sacrifice the quantity maxims in order to be as clear as possible.

In anaphoric resolution, both linguistic and extra-linguistic contexts may influence the correct interpretation of the pronominal reference. For example, extra-linguistically, it is possible for the speaker to assume a common perception ground where referents can be deictically retrieved from the interlocutor. This always holds true for first- and second-person pronouns which are treated as given by default in a conversation.

In some languages, when the referent is assumed to be salient and highly accessible to the addressee, pronouns may also be dropped without risk of making the communication ambiguous. A similar phenomenon is addressed in the next section.

2.2.4.1.3 Null arguments in spoken languages

As stated before, in some specific syntactic and pragmatic contexts where a referent is consistently kept salient across the sentences in a discourse chain, the pronominal expressions may be dropped in some languages, without affecting the retrievability of the referent. Such omissions are generally permitted when additional linguistic strategies make the decodification of the argument possible. These strategies may consist of syntactic phenomena, such as a rich inflexional morphology based on certain types of verbal agreement conveying gender, number or person information, or of pragmatic and contextual phenomena, which make the omission possible. However, not all languages display such possibilities. For example, English does not allow a drop of the nominal expression as the subject, while, by contrast, other languages, such as Italian, Japanese or Chinese, do permit this phenomenon.

According to typological studies (Givón 2016), despite what is suggested by the

linguistic definition "pro-drop", diachronically it seems that the rise of pronominal agreement and its spreading function as an anaphoric strategy was a phenomenon which arose from the omission of nominal referents, defined as zero anaphora, which was widespread cross-linguistically in the first phases of many languages.

According to Ariel (1991), empty slots are distinguished depending on the presence of agreement markers which may help in retrieving a null argument. The crucial accessibility marker, in that case, is the presence of the agreement marker. Therefore, according to the postulation of the accessibility scale, a delineation of the cross-linguistic classes licensing zero anaphora phenomena are described in the table (1) below.

Table 1. Type of agreement markers across languages.

'True' Ø	No agreement at all, like in Chinese.
'Poor' AGR	Gender and number inflection, but no person marker, like in the present tense in Hebrew.
'Rich' AGR	'Italian' inflection, where gender, number and person are marked.

(Ariel 1991:454)

According to these expectations, Ariel predicts that "no language allows zero subjects with no inflection whatsoever, but does not allow zero subjects to occur when AGR is partially or fully informative" (Ariel 1991:454). Other studies (Givón 1992, 2016) consider the use of zero anaphora as a device for signalling that information is intentionally activated and does not need to be re-activated from a cognitive point of view. Therefore, it functions as a highly-iconic cue for instructing the addressee to keep a referent active.

2.2.4.1.4 Definiteness and other strategies in spoken languages

Among the linguistic cues the speaker may send to the addressee in a conversation, some languages display the possibility of choosing the definite article in order to convey additional information about the referential identifiability of the entity under discussion. Although there is a strong tendency for linguists to assume that indefiniteness and newness are correlated, and that definiteness may occur both with new and given items, a general correspondence between the use of definite categories and the supposed identifiability of the referent does exist. A newly introduced piece of information is generally presented with an indefinite article, and subsequently presented with a

definitive article. However, there are some exceptions: for example, some linguistic categories related to uniquely identifiable referents, or uniquely salient referents, such as the moon, the sun, or the planet. In this case the speaker assumes the hearer would have no doubt about retrieving the referent, even when they are not active in the discourse, because of their uniqueness. Moreover, sometimes, a new expression may be accompanied by a definite article because of the presence of other modifiers which specify its identifiability, as in the sentence "The mechanic who fixed our carburettor last week is very expert" (Chafe 1976:40). A definite description may also be used when including the new expression in a larger context, such as "We looked at a new house yesterday, the kitchen was extra-large" (Chafe 1976:40). Since every house is supposed to contain a kitchen, the definite expression is not considered new, but identifiable. Under these circumstances, the definiteness status is better preserved than the givenness status, since the restricted memory of an active referent in a discourse does not necessarily affect the use of definiteness, as it does for givenness.

Cross-linguistic research has shown how topic elements generallyrelate to definite forms, as also confirmed by the use of the topic marker 'wa' in Japanese, which makes it obligatory to interpret the referred expression as definite. This is also attested by the use of definite nominal phrases in English topic structures. In her study, Gundel (1988) established this further correlation through the identifiability principle.

> *Topic-Identifiability Condition*: "An expression, E, can successfully refer to a topic, T, iff E is of a form that allows the addressee to uniquely identify T."
>
> (Gundel 1988: 214).

Importantly, if the identifiability of a referent seems to be largely correlated to its definiteness (Gundel 1988, Lambrecht 1994), by contrast, the familiarity of a referent cannot follow from definiteness; indeed, a definite entity in the right context may not be familiar to the hearer.

2.2.4.2 Referential Hierarchy in spoken languages

As previously mentioned in § 2, although no straightforward correspondence between the linguistic form and the pragmatic status of a referent is detectable, the possibility of a common scale of linguistic elements which encode different levels of accessibility is still a contested issue among scholars (Prince 1981, Ariel 1990, Givón 2016). In the present section, a brief overview of previous studies is proposed, in order to more throughly investigate the syntactic and pragmatic relation in terms of referential hierarchy.

Starting with the concept of assumed familiarity, which concerns the assumptions made by the speaker/writer about the hearer/reader's familiarity regarding certain discourse referents, Prince (1981a) developed the model in Figure (9).

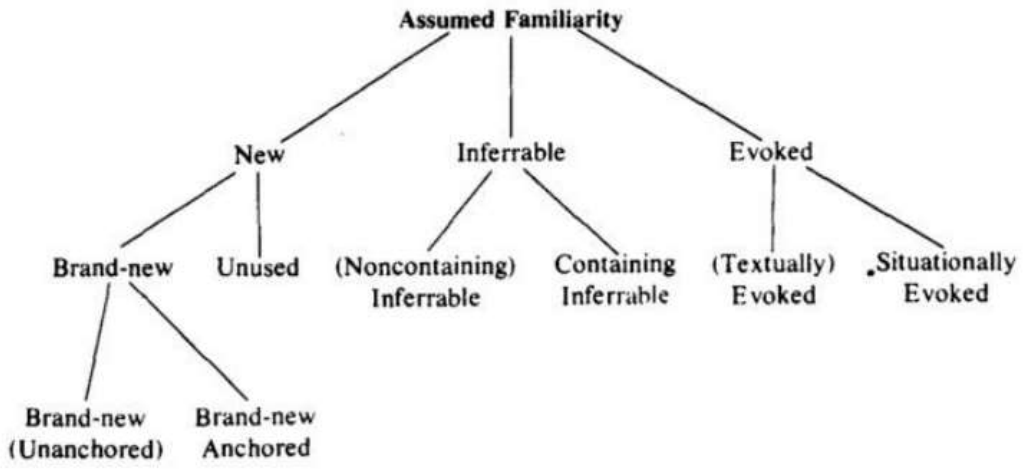


Figure 9. The Assumed Familiarity Model

(Prince 1981a: 237)

She further divided the notion of assumed familiarity into three macro-classes of different discourse entities: new, inferable and evoked. These three concepts are then distinguished into specific linguistic sub-types. The first group (the new referents, as shown in the picture (9) above, was divided into two sub-categories: (i) brand-new entities (BN), when the speaker first introduces an entity into the discourse and the hearer has to create a new entity, and (ii) unused (U), when the "hearer may be assumed to have a corresponding entity in his/her own model and simply has to place it in the discourse model" (Prince 1981:235). Brand-new entities are further divided into two categories with respect to the absence or presence of links (also called anchors) to some other discourse referent, which Prince respectively defined unanchored (BN) and anchored brand-new (BN^A). An example of anchored brand-new is the sentence "A guy I work with is going to be fired", where "I work with" represents the anchor and eases the introduction of a new referent by linking it to the speaker's discourse.

The second group of entities is defined as inferable (I) and concerns entities where the speaker "assumes the hearer can infer it, via logical […] or from discourse entities already evoked or from other inferables" (Prince 1981a: 236). This notion corresponds to the entailed entities discussed by Chafe (1976), namely, entities which may be inferred by other related entities, such as the driver being inferable from a bus, because it is assumed that each bus has a driver.

Inferable entities are composed of sub-classes depending on whether (i) they are containing inferables (I^C) or (ii) non-containing inferables (I). In containing inferables, what is inferred is also contained within the nominal expression itself, as in the construction "one of these eggs" which includes the set to which the mentioned member belongs. Finally, the third class concerns the evoked entities (E), namely when a referent is already present in the discourse model. In this case, the reintroduced entity could be textually evoked (E) if a previous mention of that entity was textually present in the discourse, or situationally evoked (E^S), if the hearer knows how to evoke such an entity from the extra-linguistic context.

In analysing naturally occurring oral texts in terms of assumed familiarity, Prince collected a number of tendencies and patterns which could be summarized by a scale of familiarity, as shown in the example (45) below, where evoked entities are assumed to be more familiar than new items.

(50) $\left\{\begin{matrix} E \\ E^S \end{matrix}\right\} > U > I > I^C > BN^A > BN$

As Prince pointed out "the use of an NP representing a certain point on the scale implicates that the speaker could not have felicitously referred to the same entity by another NP higher on the scale" (Prince 1981a:245). Such implicatures could be subsumed within the maxim of Quantity provided by Grice. Another way to reformulate this concept is with the Conservation Principle: the hearers prefer to use old entities rather than create new ones when possible, and speakers are cooperative in terms of allowing the hearer to take full advantage of old entities.

Even more interestingly, Prince stressed the use of brand-new anchored entities as a means of upgrading this entity in the familiarity scale. Such uses seem to appear mostly in informal conversations. Moreover, she repeatedly pointed out the reservation of subject positions for nominal expressions that are higher in the scale, as well as a huge variety of syntactic structures that could be counted as strategies for maintaining the highest possible subject, such as it-clefts, left dislocations out of subject position, existential *theres* and relative clauses. An existential *there* displayed in the sentence below shows this tendency to "keep entities low on the scale out of subject position":

(51) There are some funerals, THEY really affect you.

By contrast, the same analysis applied to written texts on linguistics seems to show different patterns of communicative management. According to Prince's investigation, firstly, such texts show a higher degree of metalinguistic inferences, and secondly, the abstract nature of the numerous entities involved makes the taxonomical operation more complex. Thirdly, the difference between unused and containing inferable expressions in the written text were not particularly clear-cut; indeed, what is unused for a certain reader could be a containing inferable for another. And this leads us to the fourth difference pointed out by Prince, namely that the cultural assumptions of oral and written texts differ in nature. In particular, the cultural assumptions made in the written text in this case have an abstract nature and are highly complex. Finally, as a fifth point, the huge size of composing entities in the text makes analysis more difficult, since in the written text entities are larger and mostly composed of attributes and modifiers. In both texts, however, subjects show a tendency to maintain the highest possible position in the scale, therefore they are "more likely to be Evoked than Inferable and more likely to be Inferable than New" (Prince 1981a: 252).

Ariel (1988, 1991), in her analysis, also suggested that sentence-level expressions reflect a scale of accessibility. As for given nominal expressions, or expressions already introduced into the discourse, previous studies claimed that the distance between the last mention of the referent and the current expression referring to it was crucial (Prince 1981, Ariel 1991). According to these theories, the more recent a mention is, the more accessible the referent should be to retrieve.

Nonetheless, distance is not the only variable which affects the grade of accessibility of a referent. Referential competitors are also related to the notion of prominence and accessibility. Indeed, the presence of more competitors between an earlier mention of a referent and its current mention weakens the uniqueness of the referent, making it less accessible in the mind of the addressee. Other factors affecting the accessibility of a referent are the relevance of topicality in antecedent assignments and the importance of the context in identifying antecedents (Ariel, 1988).

The analysis of the use of anaphoric expressions in a text reveals that pronouns occur within the closest distance, demonstratives occur in an intermediate distance and definite descriptions occur in the furthest context. In line with these theories, definite descriptions, demonstratives and pronouns are respectively classified as low, intermediate and high accessibility markers. Adding null arguments to the analysis, Ariel found (1991) that they are higher accessibility markers than pronouns. A full scale of the referential hierarchy sketched by Ariel (1991) is provided below in Figure (10). It

also contains other referring expressions, such as the use of first or last name and the length of definite descriptions, which seems also to be related to accessibility.

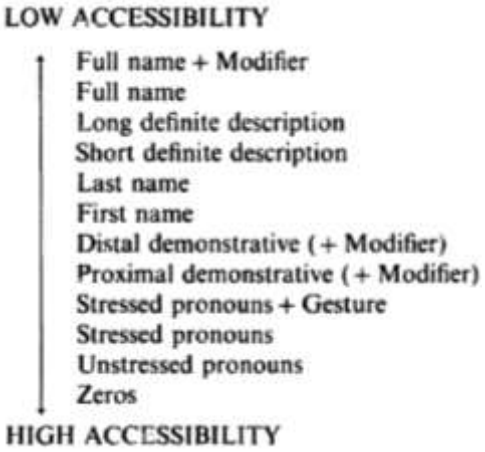


Figure 10. Referential expressions ordered with respect to their low or high degree of accessibility.

(Ariel 1991: 449)

This scale is intended to be universal. Indeed, universally, three criteria of ranging accessibility are considered: informativity, rigidity and attenuation. The more informative, the more rigid and the less attenuated the form is, the lower accessibility it encodes. Infomativity concerns the amount of information contained in the referring expression, therefore in this sense, a full name with a modifier is more informative than a bare noun. Rigidity, instead, relates to how uniquely referred a form is. In this case, for example, a first name is less rigid than a last name. Finally, according to Givón (1983), attenuation is related to the phonological form used in the production of the referent. Stressed pronouns are less accessible than unstressed pronouns, which are attenuated forms.

Differences and variance within languages are not excluded, since features of the scale may vary cross-linguistically. Moreover, as pointed out before, a language may lack some of these forms, as for example with the definite markers, which are absent in Slavic languages. The main universal claim relates to the selection of these markers: "a language can never license the use of a high accessibility marker in a context where it does not license the use of a lower accessibility marker" (Ariel 1991: 462).

According to Lambrecht (1994), topics do not always have the same degree of accessibility; as the relationship between identifiability and pragmatics, acceptability is expressed in terms of a scale. Similarly to Prince (1981), Lambrecht's scale considers five degrees of topic: Active, Accessible, Unused, Brand-new anchored and Brand-new

unanchored. In the lowest degree of topic, the referent is unidentifiable for the hearer at the time of utterance and lacks a referential link anchored through which she can decode its identity.

Gundel et al. (2019) propose a Givenness Hierarchy, which takes into account six cognitive statuses which are relevant in the encoding of referents, as shown in Figure 11 below.

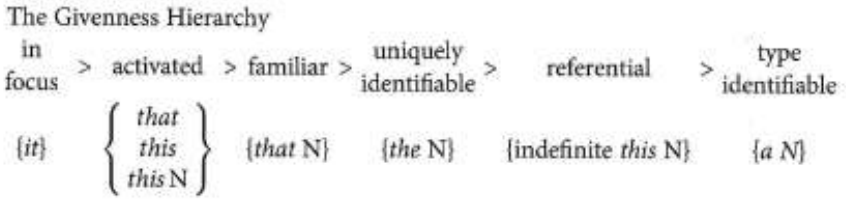


Figure 11. The Givenness Hierarchy

(Gundel et al. 2019: 68)

The main difference with Ariel's (1988, 1991) proposal lies in considering each of these levels as being included by all the lower levels, but not the other way around. Therefore, the statuses are ordered from the most restrictive to the least restrictive, and an 'in focus' item is assumed to be already activated, familiar, uniquely identifiable, referential and identifiable.

Similarly, Givón (2016) tracked a list of common referential coherence strategies illustrating the scalar property in terms of higher or lower continuity of references across the discourse.

Most common referential coherence devices
highest continuity

a. zero anaphora
b. unstressed anaphoric pronouns
c. stressed independent pronouns
d. definite NPs
e. definite NPs with modifiers
e. Indefinite NPs

lowest continuity

Figure 12. Referential coherence devices with respect to their high or low degree of continuity.

(Givón 2016:4, ex. 4)

By starting from this schema, where the linguistic device detected as conveying the highest accessibility grade is the zero anaphora, and the lowest continuity is coded by

indefinite nominal phrases, Givón (1983, 2016) supported the hypothesis that the distance between referents seems mostly to affect the accessibility of the referred entity, and is therefore reflected in its syntactic codification. In order to demonstrate this hypothesis, three clusters of the major linguistic strategies for encoding higher or lower accessibility in discourse were created and bound to an expected average of the anaphoric distance (AD).

Expected anaphoric distance (AD) of major referent-coding devices:

continuity	devices	anaphoric distance
highest (chain-medial)	zero unstressed pronouns pronominal agreement	1 clause
intermediate (chain-medial)	stressed pronouns Y-movement	2-3 clauses
lowest (chain initial)	full NPs L-dislocation pre-posed adverbials	> 3 clauses

Figure 13. Anaphoric sentential distance of referent coding devices with respect to high and low degrees of continuity.

(Givón 2016:9, ex. 15)

By considering the mean of the sentential distance amid antecedents and their anaphoric resumption in spoken English, Givón (2016) recomputing Givón (1983), carried out the analysis reported in (14) below.

Mean AP values of major referent coding devices in spoken English

category	N	mean AD value
zero	117	1.0
unstressed PRO	336	1.0
stressed PRO	75	3.75
definite NP	69	10.15 **[FN 12]**

Figure 14. Mean value of referent coding devices in English with respect to the anaphoric sentential distance.

(Givón 2016:10, ex. 17)

As shown in the schema above, the analysis in spoken English confirms the expectation regarding the occurrence of referential coding devices with respect to the sentential distance. Indeed, the zero anaphora and unstressed pronominal expressions require a short distance between anaphoric devices. By contrast, definite nominal phrases allow a longer distance. Moreover, the high frequency of zero anaphora and pronominal expressions enhanced the idea that these devices are mostly involved in highly

accessible contexts, where the same referent is mentioned repeatedly. On the other hand, definite nominal expressions are mostly employed in less accessible contexts.

Interestingly, in his analysis, despite the different syntactic properties which exist cross-linguistically, these patterns hold for more than one language, such as spoken Spanish, spoken Japanese, Biblical Hebrew, and Ute. Of course, some internal specific variations or some small exceptions do exist, depending for example on the presence of a flexible word order.

Our understanding of the complex correlations between cognitive, pragmatic and syntactic juxtapositions have revealed an interesting attempt to explore how information shared between the listener and the speaker is managed and shaped within communication exchanges. Terms such as accessibility or retrievability are therefore not only cognitive concepts, but they are also reflected in linguistic forms and categories. Despite the aim of a hierarchical scale encoding linguistic devices with universal value, each language singles out its particular range of linguistic tools, ruling out those elements which do not have correlation in their systems, promoting some forms, and marginalizing others.

Until about forty years ago, research has rotated around spoken language studies, where only the auditory-vocal channel and its consequential phenomena were investigated. Recent studies of the visual-gestural modality used in signed languages are expanding on existing theories by comparing, challenging and discussing this phonocentric paradigm. The following sections seek to explore the same questions addressed in this chapter, but considering studies carried out on different sign languages.

2.3 Sentence Topics in Sign Languages

Sign language linguistics has incorporated topicality into its studies since the very beginning of this field of research. Early studies on topicality were carried out by linguists studying American Sign Language (ASL), since this was the first sign language to be investigated using a scientific approach.

As with spoken language studies, however, work on topicality in sign languages shows a high level of stratification and ambiguity in addressing the topic-related phenomena, and this is especially prevalent in the research carried out several decades ago. Indeed, some of the earlier studies on topics displayed both terminological and ontological issues. For example, the term topicalization was indistinctly used for indicating expressions that convey new information or emphasis, and which are not strictly related to the notion of topicality (Coulter 1979, Padden 1988, Coerts 1992, Van Gijn 2004).

Moreover, in many cases the analysis of these phenomena completely missed the pragmatic context, and the data was considered to be isolated from its linguistic or extra-linguistic contexts (Fischer 1974, Liddle 1980).

Firstly, Friedman (1967) highlighted the importance of basing linguistic analysis on topicality in discourse, rather than isolated sentences. Indeed, she pointed out the striking differences which arise from the comparison of the two types of data (elicited sentences and discourse text). In particular, she noticed that isolated sentences are closer to English grammar than recorded texts. The function of context was also detected as being extremely relevant in the resolution of the information exchanged in a discourse. It is important to note that, in her analysis, space and body displacements play a crucial role in setting or solving the referential items, especially with agreement and directional verbs. Moreover, she focused on the argumental nature of topics, generally considered as the subject or the object of a predicate.

Another issue related to the first analysis carried out in ASL on topicality concerns the use of non-manual markers (NMMs). NMMs consist of body movements such as a rightward or leftward lean (right-l, left-l), or facial expressions such as raised eyebrows (re), squinted eyes (sq), an eye blink (eb), and a head nod (hn). These markers fulfil phonologic, morpho-syntactic and pragmatic functions in sign languages and are optionally involved in signalling topicality and other left peripheral features (for a deeper insight into NMMs, consult § 2.3.3). Despite the optional nature of these markers, some studies (McIntire 1980, Padden 1988, Janzen 1997) considered these elements as crucial for the recognition of topics. Padden (1988), for example, stated that a "topicalized constituent appears with topic marking in clause-initial position" (Padden 1988: 90). She confused sentence-initial constituents, which fulfil emphatic functions with topic constituents, and furthermore accounted for the phenomenon by relying primarily on the presence of non-manual markers. Such assumptions have in some cases generated tautological explanations in studies which have tried to explain topic phenomena by only establishing topical elements from the presence, or indeed absence, of NMMs.

One of the first comprehensive studies on topicality was carried out by Aarons (1994). Her taxonomy of topics provided a threefold account, by considering the pragmatic aspects, syntactic relationships and prosodic properties related to the three different types of topic.

Linguistic interest in topicality also extended to other sign languages. For example, Engberg-Pedersen (1993) analysed ASL and Danish Sign Language (DSL); Deuchar (1983) explored British Sign Language (BSL); Rosenstein (2001) studied Israeli Sign

Language (ISL); Sandler and Lillo-Martin provided a cross-linguistic study (2006); and Els van der Koij (2009) focused on the Sign Language of the Netherlands (NGT). More recently, aboutness topics and scene-setting topics have been analysed by Sze (2008, 2011) for Hong Kong Sign Language (HKSL), and by Kimmelman (2014) for the Sign Language of the Netherlands (NGT) and RSL (Russian Sign Language), while Kimmelman & Pfau (2016) offered a more extensive overview of topichood across SLs. Contrastive topics are a less commonly investigated group of phenomena, and are generally considered in broader studies on contrastiveness (Barberà 2015, Mayol & Barberà 2018, Zorzi 2018). Ongoing research into Catalan Sign Language (LSC) focussing on contrast (Navarrete, in prep.) might shed some light on the phenomenon.

This second section of the chapter is therefore intended as a discussion of previous research into sign languages which has been crucial for establishing the functional background for the current investigation. As in the section on spoken language, topicality is here addressed from a pragmatic, syntactic and prosodic point of view, in order to better outline the grammatical properties of such phenomena. However, unitary studies (Aarons 1994, Sze 2008, Kimmelman 2014) have for some time dealt with topic types from all three perspectives, and, in such cases, the studies are here split into different spheres and separately addressed for the sake of clarity. Among the pragmatic types of sentence topics in sign languages, aboutness, scene-setting and contrastive topics are singled out and addressed in § 2.3.1.

From a syntactic point of view, some structures used to encode topicality are presented in § 2.3.2.1. In particular, hanging topics (§ 2.3.2.1.1), left-dislocated constructions (§ 2.3.2.1.2), and the default subject of the clause (§ 2.3.2.1.3) may be attributable to aboutness topic type; time and space adverbs may be attributable to scene-setting topics (§ 2.3.2.1.4), and finally, examples of contrastive topics are traceable in the literature on sign language, especially in coordinate structures containing contrasted themes (§ 2.3.2.1.5). Word order in different sign languages and in LIS, with a particular focus on the left periphery's syntactic distribution, is outlined in § 2.3.2.2, and the issue of base-generated topics or the moved nature of topics is discussed in § 2.3.2.3.

Finally, studies on the prosodic contours accompanying different types of topics are considered and commented upon in § 2.3.3. Due to the close correlation between topicality and referentiality, § 2.3.4 is dedicated to providing an overview of the referential expressions and the language-specific devices used in signed languages for encoding the informational status of topic elements (§ 2.3.4.1). Moreover, referential hierarchies and cross-linguistic studies which have sketched a hypothesis about these functions are discussed in § 2.3.4.2.

2.3.1 Pragmatic accounts of sentence topics in sign languages

Studies on topicality in sign languages are less numerous than in research carried out on spoken languages. Consequently, the linguistic analysis of the different grammatical aspects related to these phenomena is sometimes hard to deconstruct, especially when the same author addresses the phenomenon from a poly-perspective view. For example, Aarons (1994) identifies three topic types by basing her analysis on a threefold investigation, considering interrelated pragmatic, syntactic and prosodic properties of topicality. In the current study, for the sake of clarity, each of these aspects is respectively considered in its own separate section.

Very often, pragmatic definitions are inconsistently used from scholar to scholar, and sometimes similar labels may refer to different concepts, or vice versa. One of the first researchers who explicitly mentioned the pragmatic functions of topics in sign languages was Sze (2008, 2011). By deconstructing previous terminological overlaps, she sought to create some order among earlier studies and to fix common criteria in order to compare studies.

The following sections highlight the pragmatic issues related to the concepts of topichood addressed in different studies, and discuss how terminological and theoretical assumptions often affect research findings.

2.3.1.1 Pragmatic aspects of aboutness topics in sign languages

Despite their label, "aboutness topics" only arise in recent studies about SLs (Sze 2008, 2011, Kimmelman 2014), while earlier research on topicality has described a situation comparable to the pragmatic definition of aboutness. Coulter (1979), for example, demonstrated that the topic item may be separated from the remaining part of the sentence. In this case, the topic establishes the discourse content about which the main clause adds some information. However, no distinction seems to be made between discourse topic and sentence topic, and no attention is paid to the specific informational status of these elements.

Friedman (1976) defines topics as being those entities which arise first in the sentence, regardless of their subject or object syntactic role. In line with her definition, topics create a scene, and as such become definite. Looking at the examples provided in her data, these topics are nominal phrases about which a comment is made, and such analyses correspond to the concept of aboutness topic, despite the fact that her definition

of topic as scene might be confusing. Consider the example from Friedman, reported below:

(52) **GIRL IX** / HE (INDEX) WANT MEET
'He want to meet the girl'.

(ASL, Friedman 1976:44)

In line with this hypothesis, she claims that a "topic must be established before discourse can proceed" (Friedman 1976: 44). In this sense, she considers as topicalization the establishment of the topic item before the remaining part of the sentence, without making reference to its syntactic nature. Again, the term topicalization is used with a generic interpretation.

As stated above, Aarons (1994) carried out one of the first extensive studies on topicality for ASL. Pragmatically, she singles out a first type of topic (T1) which mostly occurs when the topic is a member in a set of a restricted universe of discourse, and when it conveys emphasis or contrastive meaning. An example of this topic type is reported below.

(53) FOUR WOMEN LIVE IN HOUSE IX. **MARY$_i$,** JOHN LOVE t_i
'Four woman live in that house over there. Mary, John loves'.

(ASL, Aarons 1994:158, ex. 25)

However, subsequent studies (Neidle et al. 2000) have proven that this first topic type is better addressed as a focus rather than as a topic, and, for this reason, it will not be further considered for the purpose of the current study.

A second type (T2) mostly introduces new information into the discourse and identifies a topic shift in the communication. It relates to the remaining part of the sentence by only bearing semantic relationships. This topic type may be considered the prototypical aboutness topic, since like the hanging topic structure it creates a topic about which the remaining sentence adds some new information. An example of this topic is reported below:

(54) **VEGETABLE**, JOHN LIKE CORN
'As for vegetable, John likes corn'.

(ASL, Aarons 1994:160, ex. 28b)

Despite the categorization of the second topic type as a new topic, which is introduced by changing the topic discourse, Aarons assumed that such topics must

already be familiar in some way to the audience; otherwise with a completely new concept this topic type would not be grammatically acceptable.

A third type (T3) introduces information with which the speaker is assumed to already be familiar, or which is already known by the addressee. Pragmatically, this topic may also be considered as an aboutness topic, even though Aarons did not mention any specific terminology.

(55) **MARY**$_i$, JOHN LOVE IX$_{3i}$
'(You know) Mary, John loves her'.

(ASL, Aarons 1994:164, ex. 33)

Aarons specifies that this latter topic type is in a sense comparable to relative clauses, providing definite descriptions about the argument with which it is co-referential. Furthermore, similarly to the second topic types, Aarons defines the third topic as a topic which introduces new information that the speaker considers as already shared or known by the addressee. However, no further information is provided in order to better clarify the pragmatic distinctions relating to the different types of contexts where these topics are used. According to Aarons, both the second and third types of topic could be considered instances of aboutness shifted topics, namely topics which have been reintroduced into the discourse and assumed as given by the speaker.

One of the first studies in sign language linguistics where aboutness topics were openly mentioned was carried out by Sze (2008) for HKSL. In line with Reinhart (1981) and Gundel (1985, 1988), she defines aboutness topics as those expressions which represent what the sentence is about. However, she integrates the familiarity and the identifiability condition stated by Gundel (1985, 1988) into the broader referential assumption of sentence topics supposed by Reinhart (1981). She also specifies in detail the adopted criteria for selecting topics, both syntactically and pragmatically defined. Sze excludes presentational, identificational and event-reporting sentences from her analysis, since these types of sentences are assumed to bear only new information (further details about her selection are provided in § 3.4.3.).

Unlike previous studies on topicality (Liddell 1980, Aarons 1994), Sze particularly took care of the dataset employed in her study. Indeed, she collected spontaneous data and paid attention to the contextual discourse, where topic was detected. It is important to note that Sze's study was one of the first to distinguish the informational status of a topic, namely between shifted and continued aboutness topics. In the first case, a previously mentioned topic is newly introduced into the discourse; in the second case the topic is maintained as a constant across two or more sentences. This binary

distinction might be useful for analysing the way in which pragmatic information is syntactically encoded in communicative exchanges (Givón 1983, Ariel 1991).

An example of an aboutness topic extracted from Sze's study is shown below in (56) and marked in bold.

(56) IF **HEARING PEOPLE** SIGN-LANGUAGE INTEREST HAVE, SIGN-LANGUAGE BE-SUCCESSFUL WILL.
'If hearing people have an interest in sign-language, (they) will excel in their signing skill'.

(HKSL, Sze 2008:137, ex.35)

Similarly to Sze (2008), Kimmelman (2014) also carried out a comprehensive study of aboutness topics in NGT and RSL, considering pragmatic, syntactic and prosodic phenomena. In line with Reinhart (1982) and Gundel (1988), aboutness topics are defined as given arguments of the predicate, namely subjects or objects about which the sentence adds some information. However, he further restricts the broad notion of aboutness topics, by considering only prototypical topics, or those expressions which convey old information. An example of an aboutness topic in RSL selected in his study is reported below (57) and highlighted in bold.

(57) **IX CAT** IX THINK
'The cat thinks'

(RSL,Kimmelman 2014:48, ex.2a)

Aboutness topics have never been explicitly investigated in LIS. However, in line with the analysis carried out for spoken languages (Rizzi 1997, Benincà & Poletto 2004, frascarelli & Hinterhölzl 2007), earlier studies in LIS have reported the presence of more than one topic position. One of the first studies to address the phenomenon was Brunelli's (2011). He argues in favour of the existence of two topic positions, where frontalized constituents are placed. The first position seems to be able to assign a specific NMM contour, which consists of raised eyebrows, while the second topic position consists of a presupposed or discourse-linked (D-linked) constituent, and does not seem to be associated with any particular NMMs (further details about this analysis are provided in § 2.3.2.1).

Another study attesting to the existence of aboutness topics in LIS is a piece of research conducted on relative clauses (Branchini 2014). As has been shown in other analyses of spoken and signed languages (Aarons 1994 for ASL), relative clauses and topicality display a strong correlation, showing similarity at a pragmatic, syntactic and prosodic

level. Indeed, since relative clauses, especially restrictive relatives, provide presupposed information, it is possible to consider them as broader topic constructions. Moreover, relative clauses and other topic expressions may cooccur in the same sentence, as displayed by the example (58) below, where the aboutness topic (abt) is marked for sake of clarity.

abt rel

(58) TRIP STUDENT$_i$ COMPETITION WIN PE$_i$, YESTERDAY ANNA RESERVE DONE
'As for the trip, yesterday Anna reserved it for the student who won the competition'.

(LIS, Branchini 2014:215, ex. 423a)

2.3.1.2 Pragmatic aspects of scene-setting topics in sign languages

Scene-setting topics in SLs were not explicitly studied until Sze's (2008) research on HKSL, however, phenomena which are definable as scene-setting topics have been addressed in the literature since the 1970s (Yau 1977 for a variety of Chinese SL, for ASL McIntire 1980, Aarons 1994, Janzen 1997).

The first linguistic discussions attempted to establish the order between nominals which refer to entity and nominals which fulfil locative functions, and assumed the mobility of an entity as a criterion to detect them. According to such hypotheses (Yau 1977), the immobile referent is preponed to the less immobile or the mobile one. In line with this theory, items are placed in accordance with the spatio-temporal development of a visual event.

Liddell (1980) investigated locative items involved with classifier predicates, independently from their being transitive or locative predicates. The locative relationship between the referents is expressed by the physical relationship of classifiers, as displayed in the example below, in which the annotation q is intended as a marker for question.

q

(59) FENCE 4-CL CAT V-CL
'Is the cat on the fence?'

(ASL, adapted from Liddell 1980:99, ex. 41)

McIntire's (1980) intuition was to notice that the ordering of locatives needs to be addressed as a topic-comment relationship, since the syntactic notions of subject and

locative object are not enough to account for the data analysed in her study. In confirming the scene-setting nature of the locative topics analysed by McIntire (1980), it is interesting to note that she points out the given informational status of these elements. However, she also admits that, although "the information [under discussion] is not, strictly speaking, "old, since this is the first mention", it fulfils the function of setting a background (McIntire 1980:60). This description perfectly coincides with the profile of scene-setting topics which, unlike aboutness topics, may not be previously given. Indeed, these elements function as frame-setters for the remaining propositions and are assumed to be shared as common knowledge between the speaker/signer and the interlocutors. The current framework, which is able to distinguish between aboutness and scene-setting topics, may also explain why sometimes in McIntire's examples more than one topic was found in the data, creating some difficulties in analysing the right aboutness topics. In fact, sentences containing both scene-setting and aboutness topics were wrongly addressed as containing a longer string of aboutness topics, or by accounting for scene-setting topics as aboutness.

A case of such a misleading interpretation can be seen in the sentence below, where the two scene-setting topic locations TABLE, BOWL and the aboutness topic APPLE are all accounted for as a unique topic string, such as 'the table with the bowl of apples on it' (McIntire 1980:52).

(60) $\text{SEE}_{\text{S-L}}$ pro_{3L} TABLE pro_{3L} BOWL APPLE clfr clfr:1-GO_{L} TAKE 'BITE APPLE GO-ON

'See those apples in the bowl on the table well, go get one and eat it, go ahead'.

(ASL, McIntire 1980:52, ex. 31)

Aarons (1994) also notices in ASL the presence of time and locative information which occupies topic positions and that she defines as adjuncts. However, no further analysis was carried out on these topics, nor indeed were they further defined.

Janzen (1997) argues that temporal adverb phrases are topics since they "situate an event within a temporal framework" (Janzen 1997:505). However, he also considers topics in relation to pragmatic choices made by the signer. The sentence-initial part of an utterance is therefore the space that a signer uses for negotiating shared information: therefore, by changing the order of the constituents the information which is presupposed by the signer may also change. By collecting narrative stories from different signers, he adds a caveat about the production of prototypical topics, since registers and personal styles may vary across signers.

Sze (2008, 2011) began by explicitly investigating scene-setting topics in HKSL, clearly distinguishing them from aboutness topics. In line with spoken language studies (Chafe 1976, Lambrecht 1994), she conceived of scene-setting topics as place or time descriptions which convey spatio-temporal information, and have the function of pragmatically setting the framework for the following predication. Kimmelman (2014) adopted the same framework for investigating scene-setting topics in NGT and RSL, specifying the hybrid syntactic nature of scene-setting topics which may be either given or new.

Unlike previous studies on ASL, the analysis carried out in HKSL, NGT and RSL testifies a systematic distinction between scene-setting and aboutness topics, which is confirmed by the different syntactic properties and the use of different prosodic markers (further details regarding the syntactic and prosodic features of scene-setting topics are respectively provided in § 2.3.2.1.4 and § 2.3.3.2.2). Some examples of these topics are reported below and highlighted in bold.

sst

(61) IX_1 **NOW** IX_1 LACK-KNOWLEDGE IX_1 LACK-KNOWLEDGE

'I now lack the knowledge of (computer)'.

(HKSL, Sze 2011:146, ex.47)

sst

(62) **FOURTH** IX CAT LOOK

'In the fourth story, the cat looks'.

(RSL, Kimmelman 2014:48, ex.2d)

No such pragmatic analysis of scene-setting topics has been carried out in linguistic studies on LIS. So far, little research addressing topicality in LIS has been conducted, and in those cases where it has, the pragmatic distinctions were not thoroughly investigated. However, the presence of different topic positions in LIS has been detected since the studies by Brunelli (2011) and Branchini (2014). By observing the LIS data used by these scholars, the existence of place and time descriptions which could be accounted for as scene-setting topic types is observable, although no attention has been paid to these topic types in these studies. An example of this case is shown in the sentence (63), extracted from a work about relative clauses in LIS (Branchini 2014): it consists of the temporal indication LAST-WEEK. Although no context or specific translation for the interpretation of this element is provided in the study, it is possible to consider it as a scene-setting topic, since it seems to occupy a topic position in the left periphery preceding the subject and following the two other topics, LARA and TRIP.

top top sst

(63) LARA TRIP LAST-WEEK IX_1 RESERVE DONE

'As for Lara, as for the trip, [last week] I reserved it'.

(LIS, adapted from Branchini 2014:215, ex.422)

2.3.1.3 Pragmatic aspects of contrastive topics in sign languages

Unlike other pragmatic types of topics such as aboutness and scene-setting topics, contrastive topics are an understudied phenomenon in SLs[16]. As observed in studies on spoken languages, the notion of contrastive topic is discussed among scholars and not all linguists agree on how to categorize the notion of contrast. Some scholars support the hypothesis of contrast as an independent category which may overlap with topic or focus (Engberg-Pedersen 1993, Navarrete-Gonzáles 2017, in prep.), while other scholars (Sze 2008, Crasborn & Van der Kooij 2013) seem to conceive of contrastive topic, and especially contrastive focus, as sub-instances of the macro-categories of topic and focus. Since supporting one or the other theory is outside the scope of this investigation, in the current study contrastive topics are only addressed in order to observe the relationships between these elements and other topic types in a sentence.
Contrastive topics create an opposition between previously mentioned elements or between constituents which have already been introduced in the mind of the interlocutors. For this reason, as with aboutness topics, contrastive topics are accountable as arguments of a predicate.

Trying to account for the terminological confusion of previous studies on contrastive structure in ASL (Aarons 1994), Wilbur (1997) shows, by comparing ASL to LSC, that different constituents such as contrastive focus and reintroduced topic in ASL only appear to show an identical structure, hiding a different pragmatic status.

When analysing aboutness topics, Sze (2008, 2011, 2015) detects the presence of frontalized objects including topic and non-topic elements, all of which fulfil contrastive functions. In this case, these objects may be marked by raised eyebrows and specific head positions. Pragmatically, however, at least some of the constituents not accounted for as topics also seem to be considerable as such according to the current analysis. An example of this misleading interpretation is provided in (64) below. Contrastive topics are highlighted in bold:

[16] In the literature, the notion of contrast has instead been related to focality (see Wilbur 1997, Neidle 2002, Sze 2011, Crasborn & Van der Kooij 2013, Kimmelman 2014, Kimmelman & Pfau 2016 among others).

(64) **IX-books-in-poor-condition SERIOUS IN-POUR-CONDITION IX-books-in-poor-condition** Ø SELL NOT DUMP […] **IX-books-in-good-condition BOOK SEEM BOOK IX-books-in-good-condition EXCELLENT IX-books** IX_1 SELL CAN […].
'Books that were in poor condition, (I) would not sell them and would just throw them away […]. Books that were still in good condition, I could sell them […].
(HKSL, Sze 2008:196, ex. 91)

However, such phenomena were not investigated further and data on contrastive objects in HKSL is insufficientto be considered completely reliable.

Kimmelman (2014) only carried out a descriptive study by considering a small amount of contrastive data collected following the QUIS manual. The analysis of his data seems to demonstrate that contrast in NGT and RSL may be conceived of as an orthogonal category, combining both focus and topic elements, despite some syntactic and prosodic differences which may be considered (see § 2.3.2.1.5 and § 2.3.3.2.3). However, Kimmelman's (2014, 2016) account risks being language-specific, and the small amount of data considered does not allow for further generalization.

By contrast, Navarrete-Gonzáles (2017), investigates contrast in LSC from a semantic and syntactic perspective, and more strongly supports the notion of contrast in terms of an independent category which may be applied to both focus or topic constituents. She notices that contrast in LSC is mainly expressed through a combination of non-manual markers, such as left and right body leans (bl) and head tilts (ht), and morphological markers, such as the use of opposite locations in the signing space. All these markers co-occur in sentences where salient contextually contrasted alternatives are present, as shown in one of her examples, see (65) below:

(65) $\underline{\text{left bl + left ht}}$ $\underline{\text{right bl+ right ht}}$
$[[\text{WOMAN}]_{top}$ WINE $[\text{DRINK}]_{foc}]_x$, $[[\text{man}]_{top}$ drink $[\text{coke}]_{foc}]_y$
'The woman is drinking wine, the man is drinking coke'.
(LSC, Navarrete, in prep., example 21)

She argues for an independent semantic and syntactic category of contrast by pointing out that NMMs for contrast are identical for both focus and topic phenomena.

She further subcategorizes contrastiveness into three semantic types and matches each of these three types with a dedicated prosodic contour. As for the first type analysed as parallel contrast, which is displayed in example (65) above, in LSC it is signalled by body lean and head tilt and realized in two opposite places within the signing space. The

second class of contrastiveness occurs when an alternative is explicitly singled out among a closed set. This is defined as selective contrast. In LSC, an additional head nod is added to the NMMs listed above to convey selective contrast. The third class, defined as corrective contrast, consists of an item which corrects a previous part of the discourse that was considered false. In this case, a strong head thrust is added to the parallel contrastive contour, probably with the purpose of emphasizing the correction. The first type of topic is the one which overlaps with topic items, while the remaining two are types of contrast which mostly overlap with focus.

Studies in LIS have not addressed the phenomenon of contrast, and no proper literature exists about the notion of contrastive topics. By marginally addressing focus and topic constituent in LIS and NGT, Brunelli (2011) notices that contrast features are different from topic and focus. Therefore, in line with some spoken language studies (Frascarelli & Hinterholzl 2007), he postulates that contrast is a feature which is independent from topic and focus. However, his analysis is basically expressed as a postulation and no further investigation was carried out on the phenomenon.

2.3.2 Syntactic properties of Topics in Sign Languages

Syntactically, topic types have been investigated since the early studies in ASL. Fischer (1975), for example, notices that both subjects and objects may occur in dedicated topic positions pre-posing the remaining part of the sentence. Liddell (1980) integrated this analysis by singling out specific NMMs spreading across the whole topic constituent. Friedman (1976) consideres topics as those entities which arise first in the sentence, regardless of their subject or object syntactic role. However, such accounts are basically descriptive and do not investigate the structural representation of topic elements.

One of the first studies to address syntactic topic types and positions in detail was carried out by Aarons (1994), again on ASL. According to her analysis topics occurred in dedicated positions adjoined to the CP, outside its c-command, contrary to the thesis about their presence in the Specifier of CP supported by Lillo-Martin (1990). Aarons demonstrates their position by analysing the spreading domain of NMMs across the sentence. Indeed, a topic item may occur in the initial part of the sentence together with a wh-expression which has been moved rightward to the Specifier of CP. However, in such constructions, the topic item cannot be marked by the wh-NMMs and this is evidence for its placement in a position higher than the Specifier of CP, as reported in the examples below.

t _____ wh

(66) JOHN, BUY YESTERDAY WHAT
'John, what did he buy yesterday?'

(ASL, Aarons 1994:148, ex. 6)

t
wh
(67) *JOHN, BUY YESTERDAY WHAT
'*John, what did he buy yesterday?'

(ASL, Aarons 1994:149, ex. 7)

The alternative case, in which the wh-NMMs spread over the topic item, as in the example (x), is ungrammatical.

Aarons singles out three different types of syntactic topics, by analysing their properties as moved or base-generated topics and their relationships with the remaining part of the sentence. She sketches a hierarchical distribution investigating the co-occurrence of these topic types in the same sentence.

Recently, Sze (2008) for HKSL and Kimmelman (2014) for RSL and NGT introduced a further structural analysis by separating pragmatic aspects from syntactic ones. This further subdivision has the advantage of shedding some light onto the complex classification carried out in earlier studies.

The following part of the chapter aims at outlining the syntactic aspect of different topic types, especially focusing on their structural properties. It is structures as follows: § 2.3.2.1 addressees the syntactic properties of the three topic types under discussion, with a particular attention on the syntactic realization of the pragmatic topic types. Specifically, aboutness topics are considered in the form of hanging topics (§ 2.3.2.1.1), left-dislocated topics (§ 2.3.2.1.2), and subjects (§2.3.2.1.3). Scene-setting topics (§2.3.2.1.4) and contrastive topics (§ 2.3.2.1.5) are also considered. § 2.3.2.2 focuses on the syntactic distribution of topics in other SLs (§ 2.3.2.2.1) and in LIS (§ 2.3.2.2.2), with a final overview about the moved or base-generated nature of aboutness topics (§ 2.3.2.3).

2.3.2.1 Types of topics in sign languages

One of the first scholars in the literature on SLs to consider the existence of different pragmatic and syntactic topic positions was Aarons (1994), who sketched a taxonomy of topic properties. She proved that topics in ASL are syntactically present in both embedded and main clauses. As stated before, Aarons (1994) analysed topic positions as

structures which are left-adjoined to CP. In particular, she identified (i) a syntactically moved topic (T1) which was later addressed as focus (Neidle 2002), and (ii) a base-generated topic (T2) that only creates semantic relationships with the remaining clause. For this reason, the latter can be considered as a type of hanging topic (see § 2.3.2.1.1). The third topic (iii) analysed is again a base-generated topic (T3), but syntactically bound to an argument of the sentence and therefore accountable as a left-dislocated topic (see for further details § 2.3.2.1.2). However, Aarons (1994) based her investigation on elicited data, reporting just a few examples of these topic types. By contrast, Sze (2008, 2011) studied topics in HKSL basing her investigation on conversational data. In line with her theories, aboutness topics in HKSL are not associated with fixed syntactic positions, but they are pragmatically identified as those constituents about which the proposition predicates something new. Unlike Aarons (1994), Sze conceived different syntactic realization of topics as identical structures in terms of pragmatic definition. Therefore, aboutness topics may be produced with several syntactic structures, such as (i) hanging topics (§ 2.3.2.1.1) or (ii) left-dislocated elements (§ 2.3.2.1.2). Moreover, aboutness topics may also be (iii) the default subject of a sentence, or the grammatical object when it bears previously mentioned information. Her analysis excluded presentational, identificational and event-reporting sentences, since these types of sentences are assumed to bear only new information. Like Friedman (1976), she also notices that, in HKSL, topics tend to be spatially anchored, that is, they are very often placed in a specific location of the signing space, although this is not mandatory. Unlike in HKSL, Kimmelman (2014) claimes that aboutness topics are sentence-initial in RSL and NGT. He also discusses other syntactic properties, such as the combination of an index with aboutness topics, as displayed in the example (68) below marked by raised eyebrows (re) over the nominal expression IX MONKEY.

re

(68) IX MONKEY, NEED BANANA
'The monkey needs a banana'

(RSL, Kimmelman 2014:50, example 7b)

According to Kimmelman, the indexation (IX) accompanying the topic item is mostly not marked as the topic constituent. Since the index is not co-referential with a previously used locus in the signing space, he theorizes that these types of indexes do not convey referential functions (indexation is further addressed in § 2.3.4.1.2). The index is therefore conceived as the real topic, while the following nominal expression is instead a type of clarification of the information carried out by the index. Kimmelman's interpretation may explain why nominal phrases following the topic index are

accompanied by the NMM 'raised eyebrows'. In fact, in this account they may represent an independent intonation phrase.

Turning now to the types of topic in LIS, the first study on LIS data within the framework of Rizzi's split CP was carried out by Brunelli (2011). He argued that topicalized elements to the leftmost part of a sentence are derived through movement operations from their base position. By applying Kayne's (1994) Anti-symmetry theory and Rizzi's (1997) Split CP, he supported the existence of higher and lower topic positions, both above the WhP (§ 2.3.2.1.2). The first position, which is higher, is marked with the NMM 'raised eyebrows', while the latter is composed of presupposed information, and is not associated with any NMM. However, no further description is provided on the syntactic behaviour of these types of topics.

2.3.2.1.1. Hanging topics as aboutness topics in sign languages

Although Aarons (1994) has not syntactically labelled the second type of topic (Tm2) analysed, the description she offeres about a sub-class of these elements seems to perfectly coincide with cases of hanging topics. Such topics are associated with an argument of the clause by a class member relationship, thus they do not bear any syntactical relationship with the sentence to which they belong. An example of these structures is represented below (69):

(69) **VEGETABLE**, JOHN LIKE CORN
'As for vegetable, John likes corn'.

(ASL, Aarons 1994:160, ex. 28b)

The hanging topic VEGETABLE is considered as base-generated in the left periphery of the sentence and only semantically linked to the remaining structure. However, no further example of this type of topic is provided in her dissertation and this does not grant a better understanding of the phenomenon. Moreover, within this second class of topics she combines elements that syntactically co-refer to an argument of the main structure, increasing the confusion between these topics and the third type of topic. Significantly, in this case, the topic that co-refers with another part of the clause must be definite, otherwise the sentence is considered ungrammatical, as displayed below.

(70) **VEGETABLE IX_i,** JOHN LIKE IX_{3i}
'As for those vegetables, John likes them'.

(ASL, Aarons 1994:161, note 11,ii)

Such topics are not easy to account for, since they could also be analysed as left-dislocated constituents. Since the study lacks further examples, the issue remains open.
Hanging topics are extensively considered by Sze (2008, 2011) for HKSL, and are identified with clause-external topic constituents placed in the very initial part of the sentence. Moreover, hanging topics do not bear any syntactic relationship with the main verb. However, these types of topics create semantic or pragmatic relationships with the subject of the sentence or with the whole proposition. In HKSL, these topics represent 4.4% of the total aboutness topics in the entire pool of data. In particular, their relationship with the sentence can be a semantic relationship, such as entity-feature, whole-part, or possessor-possessee, or a pragmatic relationship, such as a relationship of relevance. More rarely, they can convey locative or temporal information. In these cases, such expressions do not fulfil frame-setter functions, but rather represent the aboutness topic of the sentence and, for this reason, they are kept separate from scene-setting topics. Examples of such pragmatic, semantic and spatio-temporal relationships are respectively provided in sentences (71a), (71b) and (71c) below. Topics are marked in bold.

(71)

(a) **IX-San-Francisco-team** PERFORMANCE SEEM PERFORMANCE BAD IX-San-Francisco-team.
'The San Francisco Basketball team, its performance seems bad.'
(Entity-feature relationship, HKSL. Sze 2008:122, ex.11)

(b) **IX-medicine MEDICINE** Ø SLEEPY MANY SLEEPY
'That medicine, (I) became very sleepy.'
(Relevance relationship, HKSL. Sze 2008: 123, ex. 15)

(c) **ONE YEAR** Ø STUDY TWO MATTER(TIMES)
'One year, (the students) study two semesters.'
(Temporal information, HKSL. Sze 2008: 123, ex. 16)

Sze (2008) also reports the presence of pronominal hanging topics, although, in spoken languages, hanging topics generally involve nominal phrases. She explains this tendency through the spatial-anchoring strategy typically used in many SLs as an identifying-referent tool.

This tendency in HKSL, however, is true in conversational data and in question-answer pairs, narrative data behaves differently. Since in action-based stories, such as narratives, topographical references change more quickly, there is a minor use of spatial

anchored devices for encoding aboutness topics and a major use of other strategies, such as classifier predicates. Consequently, when characters change location frequently, confusion and ambiguity in interpreting the spatial loci with a referential value may arise. The minor use of pronominal aboutness topics in this type of data is understandable. Moreover, the use other referential strategies, such as the occurrence of role shift, also decreases the use of pronominal forms. As a matter of fact, this strategy substitutes the identification of a referent with the motion and the facial expressions attributed by the signer to the character under discussion.

2.3.2.1.2 Left-dislocated constructions as aboutness topics in sign languages

In the literature on SLs, constructions such as left-dislocated elements are better accounted for than hanging topics. From earlier studies onwards (Liddell 1997, Coulter 1979), it has been argued that topic items are left-adjoined in the left periphery of the clause in ASL. Moreover, it has been noted that when a subject or an object is placed in the leftmost position of a sentence, it may co-refer to a pronominal element expressed in the main part of the clause. Such descriptions may fit with the syntactic construction of left-dislocated constructions.

Although Aarons (1994) has never explicitly mentioned this construction, she syntactically describes the third topic type (Tm3) making this structure comparable to a left dislocation.

(72) **MARY$_{i}$,** JOHN LOVE IX$_{3i}$
'(You know) Mary, John loves her.'

(ASL, Aarons 1994:162, ex.30)

Similar constructions are treated as base-generated in the left periphery and the presence of the resumptive pronoun (IX) which is co-indexed with the left-dislocated topic represents a further argument in favour of such an analysis. These structures are also accepted if they display the presence of an empty category (the so-called little *pro*) which can have the case and the typical features of an overt pronoun. An example of such a situation is provided below:

(73) **JOHN,** *pro* LOVE MARY
'(You know) John, he loves Mary.'

(ASL, Aarons 1994:165, ex.36)

However, her account is not completely clear-cut, since her topic categories seem to be mostly identified through prosodic markers rather than pragmatic and syntactic properties[17].

Left-dislocated topics are also addressed in other studies in ASL (Wilbur and Patschke 1999, Wilbur 2000), which have generally placed these constituents into the Specifier of the CP. In this way, the elements are placed in the same position as other typical information structure phenomena, such as the antecedent *if*-clause of a conditional, wh-phrase expressions that have been moved, or topicalization that indistinctly refers to topic or focus items considered as moved to the left periphery. Such accounts seem to be less accurate than more detailed studies (Kimmelman 2014, Kimmelman & Pfau 2016), which have tried to assign dedicated positions to each phenomenon.

Left dislocation in NGT has been addressed by several scholars (Van Gijn 2004, Kimmelman 2014, Kimmelman and Pfau 2016). Indeed, since NGT is a pro-drop language, it also allows for base-generated constituents in the left-periphery of the sentence which are resumed by null pronouns in canonical positions. Van Gijn (2004) proves the base-generated nature of these topic constituents which are not extracted from the internal part of the clause, but rather are generated in the initial part of the sentence (§ 2.3.2.3). Kimmelman (2014) merely confirmed the presence of these constructions in both NGT and RSL, as shown in the example below. However, no detailed analysis was carried out on these structures.

(74) **GIRL IX$_{\textbf{left}}$**, IX$_{left}$ BOOK THROW-AWAY IX$_{left}$
'That girl, she threw away the book.'
(NGT, Kimmelman & Pfau 2016:820, ex. 7a)

By contrast, Sze (2008) considered left-dislocated constituents as aboutness topics. In the example (75) below, a left-dislocated construction in HKSL is presented. In this

[17] Within the second class of topic types, it seems that both instances of hanging topics and left-dislocated topics may co-exist. Aarons (1994) stated that the second topic marker contour may accompany constructions which only bear a semantic relationship to the sentencesthat we have defined as hanging topics, as well as structures where the topic expression is co-referent with an argument within the same sentence. An example of this structure in the second topic type is reported below:

FRESH VEGETABLE$_i$, JOHN LIKE IX$_{3i}$
'As for fresh vegetable, John likes them.' (ASL, Aarons 1994:162, ex.30)

Although the translation makes the sentence addressable as a hanging topic, this interpretation is not justified by further argumentation and the topic construction could also be interpreted as a left-dislocated expression.

case, the resumptive pronominal index (IX) refers to the Deaf organizations which are both syntactically left-dislocated expressions and function as pragmatic aboutness topics.

(75) [**HK-SOCIETY-FOR-THE-DEAF HK-ASSOCIATION-FOR-THE-DEAF**]$_{\mathbf{i}}$ IX$_i$ HAVE MANY ACTIVITIES
'Hong Kong Society for the Deaf, Honk Kong Association for the Deaf, they have many activities'.

(HKSL, Sze 2008:124, example 18)

As for hanging topics in HKSL, left-dislocated constructions also tend to be spatially anchored, namely, they are very often localized in the signing space, although this is not mandatorily required. Moreover, left dislocation can consist of either nominal phrases or pronominal expressions, despite the more frequent occurrence of the latter.

It is interesting to note that left dislocation in spoken language was often considered as a syntactic strategy for reflecting the pragmatic function of changing the topic of a discourse and introducing another one. However, no such function was detected in HKSL, where left-dislocated expressions are both reintroduced and maintained as topics.

In LIS, topic expressions were first detected by Volterra (1987) and then by Bertone (2007), and in fact similar constructions were considered responsible for changing the unmarked SOV word order of a sentence into the marked OSV order, as shown in (76) below:

(76) **LIBRO IX$_{\mathbf{y}}$** IX$_1$ PIETRO$_j$ $_1$REGALARE$_j$
BOOK IX$_{\mathbf{y}}$ IX$_1$ to-PIETRO (I)GIVE(him)
'That book, I gave it to Pietro as a present.'

(LIS, Bertone 2007:134, ex. 7)

Left dislocation of topic subjects may be less visible if the resumptive pronoun co-indexed with the subject is covert. However, Brunelli (2011) highlighted how subject topic constituents dislocated in the left periphery are visible by considering the initial sentence position of certain time adverbs. Indeed, when a subject is left-dislocated, it precedes the adverbial time, while generally, in an unmarked word order, it follows it. An example of a left-dislocated topic is presented below.

(77) BROTHER IX$_1$ IX$_j$ EVENING IX$_j$ $_j$VISIT$_1$

‘As for my brother, he is visiting me this evening.’

(LIS, Brunelli 2011:172, ex. 186a)

However, Brunelli did not explicitly distinguish between left dislocation and hanging topics, he merely used the concept of topicalization to account for topic displacement. In so doing, he considered the leftmost topic constituent as moved outside from an internal part of the sentence.

No further analysis has been carried out in LIS so far, and existing studies do not clearly distinguish between the syntactic properties of different topic types.

2.3.2.1.3 Subjects as aboutness topics in sign languages

Although studies which investigate topicality are generally focused on topicalization phenomena, as also claimed by Reinhart (1981, 1982), cross-linguistically, subjects are the default topic constituents, except in those situations in which other syntactic structures are contextually triggered. In line with this claim, Sze (2008) integrated default given subjects into her study, considering them as topic expressions. Her data from HKSL (Sze 2008, 2011) displayed a large majority of aboutness topics realized as the sentence subjects in all types of collected data, that is, in narratives, in answer to questions, and in conversations. An example extracted from a stretch of discourse is reported below. The subject topic is highlighted in bold.

(78) CORRECT, **IX$_1$** FELL SMALL-MATTER
‘Right, I feel that (having a flu) is a small matter.’

(HKSL, Sze 2008:126, ex.20)

Similarly to Sze (2008), Kimmelman found a large number of subject aboutness topics in his studies on NGT and RSL. Interestingly, these items are not marked by NMMs. However, in these cases, it is harder to understand whether these topics have been syntactically displaced, or if they are subjects in non-topic marked positions. Indeed, both NGT and RSL have a basic word order in which the subject precedes the predicate. Despite these doubts, some arguments support the existence of syntactically marked topics in subject positions. For example, Kimmelman (2014) found non-subject topics to be present in the corpus, a fact which testifies that not all subjects are necessarily given or placed in the marked topic position. Moreover, sometimes subject topics may precede a marked scene-setting topic providing evidence that, although not overtly marked, subject aboutness topics can be placed in a different syntactic position. Finally, he also advocates for the existence of this syntactic topic position because of the

occurrence of specific prosodic boundaries after aboutness topic expressions. This phenomenon can be interpreted as a prosodic reflex of syntactic processes that makes the topic positions marked.

2.3.2.1.4 Syntactic properties of scene-setting topics in sign languages

As stated in previous sections, scene-setting topics have not been explicitly mentioned in earlier studies on SLs (Friedman 1976, Liddell 1980, Aarons 1994), however, elements which could be considered as such have occasionally been investigated in the literature.

Liddell (1980) notices that even though sentence-initial locative adverbs are not prototypical topics, like topics, they remain syntactically outside the scope of wh-NMMs. However, Liddell (1980) did not distinguish between different types of locative items, and basically considered those items to be involved with classifier predicates, without paying attention to the transitive or locative types of verb.

McIntire (1980), further investigating locatives, identifies locational nominals, and distinguishes the cases in which they represent a static locative where the agentive nominal is placed, such as "the snake is on the rock" and cases where locatives constitute the goal of motional verbs, such as "the Teddy bear climbed up on the bed" (McIntire 1980:39). In case of reversible nominals with predicative classifiers, McIntire confirmed Liddell's observations, claiming that object locatives precede the other constituents, as presented in the sentence below. Similar expressions could be instances of scene-setting topics, however no other cues are provided to confirm this hypothesis.

(79) **ROCK** SNAKE 'AROUND' clfr: V-ON
"The snake was (sitting) coiled on the rock".
(ASL, McIntire 1980: 40, ex. 15)

(80) **TABLE** clfr BOOK UNDER clfr:PAPER ON
"The piece of paper is on the book under the table".
(ASL, McIntire 1980: 40, ex. 15)

McIntire (1980), among others, notices that a syntactic analysis of these elements is not enough to reach a better understanding of the data. She states that a topic-comment relationship needs to be considered as relevant for the study. She (1980) took care in

specifying that it is not the syntactic position alone that is able to justify the nature of these elements as topics (Friedman 1976). On the contrary, it is the other way around. In other words, according to McIntire (1980), locatives are in the initial position of the sentence because they are topics. She appealed to Anderson's (1978) study in considering the structure of old and modern ASL, which expresses old information before new information. Variation in the order is explained on the basis of the old/new distribution.

However, in her analysis, scene-setting topics are analysed as aboutness topics, and aboutness topics are defined as nominals establishing the spatial framework for the predication, thus confusing the function and the syntactic properties of these topic types. Moreover, no clear context is provided in order to prove that topic constituents possess an old or new informational status.

Involuntarily, in some examples McIntire also provides cases where scene-setting topics of time and location co-occur with a subject, as in the following sentence:

(81) NOW IX_1 FIRST ROCK-HILLSHAPE IX_1 clfr: V-WALK-UP
'Now, I'm climbing my first mountain'.

(ASL, adapted from McIntire 1980:58, ex. 34)

Aarons (1994) also makes a few observations about the occurrence of place and time information in topic positions. She considers these elements as adjuncts to the structure. She also observes that locatives are signed first in an utterance and are marked by typical NMMs. However, she did not further analyse these elements and no other detail is provided on topic-markers. Examples are displayed below.

t
(82) **TOMORROW,** JOHN PLANE ARRIVE TIME 6
'Tomorrow John's plane arrives at 6'.

(ASL, Aarons 1994:154, ex. 19)

t
(83) **BOSTON** MARY GO-TO SCHOOL
'In Boston, Mary goes to school'.

(ASL, Aarons 1994:154, ex. 20)

According to Sze (2011), scene-setting topics may consist of locative and temporal adverbs, subordinate clauses or locative expressions. Moreover, they may be signed either before or after aboutness topics, independently from their discourse status,

although they are mostly placed sentence-initially. Sze (2008, 2011) further split temporal information into two different categories: the first is composed of adverbial expressions, such as PAST, AFTER, and TOMORROW, while the second consists of NPs that set the temporal frame where the main proposition is held, such as FIRST-ROUND, or ONE-SEMESTER. Two examples of these different scene-setting topics (sst) are reported below. In (84) we can see the adverbial topic PAST, and in (85) the NP topics SECONDARY-THREE SECONDARY-FOUR SECONDARY-FIVE conveying temporal information.

sst

(84) **PAST** IX-Danny IX_1 NOT-ACQUAINTED

'Danny and I were unacquainted in the past'

(Sze 2008:145, example 45)

sst

(85) SEEM **SECONDARY-THREE SECONDARY-FOUR SECONDARY-FIVE** SPEAK NOT-GOOD SAME NOT-GOOD

'When I was studying secondary three, four and five, my speech was not very good'.

(Sze 2008:146, example 48)

As with aboutness topics, in NGT and RSL (Kimmelman 2014) scene-setting topics tend to appear sentence-initially. In the rare cases in which these two topic types co-occur in the same sentence, they generally follow a fixed order in which scene-setting topics (sst) precede aboutness topics (abt). This situation is displayed in the example (86) below, extracted from NGT, where the scene-setting topic THEN precedes the aboutness topic IX:

sst abt

(86) THEN, IX GO

'Then he goes away'.

(NGT, Kimmelman 2014:48, example 2c)

No such distinction was investigated in LIS. Previous studies (Brunelli 2011, Branchini 2014) have addressed topicality in LIS only by considering the phenomenon from a functional perspective and focusing on other linguistic phenomena.

2.3.2.1.5 Syntactic properties of contrastive topics in sign languages

The literature on contrastive topics in SLs is scarce, and those specific syntactic studies that only address contrastive topics require further analysis at a cross-linguistic level. It is, however, possible to recover some information on these elements by considering broader investigations carried out on topicality (Wilbur 2012 for ASL, Kimmelman 2014 for NGT and RSL, Kimmelman & Pfau 2016 for a general overview on SLs, Mayol & Barberà 2018 for LSC) and focality (Crasborn & Van der Kooij 2013 for NGT) or about contrastivity (Navarrete-Gonzáles *in prep*. for LSC) and spatial studies (Engberg-Pedersen 1993 for DSL, Barberà 2015 for LSC).

Engberg-Pedersen (1993) thoroughly investigated the role of space in Danish Sign Language (DSL) and, among other functions, she identifies the so-called *convention of comparison* (1993:74), namely the syntactic choice of the signer to place two referents in two opposite sides of the space for comparing or contrastive reasons.

In line with Engberg-Pedersen's (1993) study, Barberà (2015) and Zorzi (2018) found similar contrastive uses of the space in LSC. Indeed, the placement of two entities into opposite sides of the space (in contralateral and ipsilateral positions) within the same fragment of discourse triggers an overtly contrastive relationship between the two referents. In other words, "two clause discourses in which two DRs [discourse referents] are introduced in each clause and their respective verbs predicate two different, contrasting actions" (Barberà 2015:68-69) and create a double contrast effect. This is displayed in the example reported below, where the two indexations are examples of contrastive discourse referents.

(87) IX_1 SEE **IX_{3a}, IX_{3b}** NOT
'I saw him (Frank), but not him (Paul).'
(LSC, Barberà 2015:208, table 11)

left sp right sp
(88) **MARINA** COFFEE PAY, **JORDI** CROISSANT
'Marina paid for a coffee and Jordi for a croissant.'
(LSC, adapted from Zorzi, 2018: 291, ex. 321)

It is interesting to note that the number of discourse referents which can be placed in the signing locations within the same discourse stretch is a debated issue. Some scholars have argued that this depends on the capacity of the working memory, however, recent studies seem to support the hypothesis that constraints are more linguistic than cognitive

(Liddell 2003). In line with these latter studies, LSC displays a clear difference in the use of space related to the number of discourse referents present in a frame of reference.[18] When two referents are present in a piece of discourse, they are set in two different locations of the space. If more than two referents are present, then the LIST strategy is used to replace the physical use of space. LIST of signs consists of a non-dominant hand with a number of extended fingers corresponding to the referents enumerated in the discourse (Barberà 2015, Navarrete-Gonzáles *in prep*.).

Beside the use of different loci in the signing space, another modality-specific strategy for marking contrast is the sideward lean of the body to the right (rbl) or the left (lbl) (Wilbur & Patschke 1998 for ASL; Kimmelman 2014 for NGT and RSL) and in the so-called dominance reversal (Kimmelman 2014 based on Frishberg 1985). This latter strategy marks contrast by using the opposition between the two hands, that is, one hand signs a contrasted item, and the second signs the other one. An example of this use in RSL is reported below, where both hand 1 (h1) and hand 2 (h2) are represented signing the topic items DOG and CAT.

(89)

	lbl	rbl	
h1:	DOG		BITE
h2:		CAT	BITE

(RSL, Kimmelman 2014:126, ex. 29a)

An interesting distinction between contrastive non-focal items is provided by Mayol & Barberà (2018). They account for three types of contrastivity in LSC, assuming that non-focal pronouns bearing contrastive functions can be considered as contrastive topics. They identify examples of (i) double contrast, which displays explicit alternatives, (ii) implicit contrast, when the alternatives are salient, but covert or easily retrievable from the surrounding context, and (iii) weak contrast. This latter type of contrast expresses the ignorance or unwillingness of the speaker to involve himself in considering the validity of the predicate with respect to the referent of the contrasted item. No examples of this latter type of contrast have been found in the data and a dedicated experiment was conducted for better understanding this third use of contrast in LSC. In the following examples the first two types of contrastive topics are provided.

(90) THEN **IX_{2pl}** WATER BOAT/SAIL **IX_1** STAY

[18] Lillo-Martin & Klima (1990) define it as the management of spatial location for placing discourse referents belonging to a sentence or to a short stretch of discourse (based on Barberà 2015:211).

‘Now, we will go sailing in the water and you will stay here.[19]’

(Mayol & Barberà 2018:443, ex. 26)

(91) FAMILY $IX_{3pl\text{-}a}$ UPSET SAD IX_{3b} BOY HAPPY, REASON **IX_{3b}** BOY HUNGRY NOTHING.
‘The family was upset and the boy was happy because he was not feeling hungry at all.’

(Mayol & Barberà 2018:443, ex. 27)

Even though it would have been less expected in the implicit contrast, since the alternatives are not explicitly mentioned, both the contrastive types of topic are signed using the opposition of two loci in the signing space. Similarly, when addressing parallel contrast, one of three cases of pragmatic contrast, Navarrete-Gonzáles (*in prep.*), explicitly refers to the possibility that this type of contrast may overlap with both topic and focus items, as represented below:

left sp right sp

(92) **GIORGIA** LINGUIST **RAQUEL** INTERPRETER
‘Giorgia is a linguist and Raquel is an interpreter.

(LSC, adapted Navarrete-Gonzáles in prep., ex. 31)

Once again, these types of topic are expressed by means of the signing space and are marked by a rightward and leftward movement of the body, confirming the function of contrastiveness.

Scholars have expressed some hesitation in considering these markers as specific contrastive strategies, rather than merely a topographic use of the space, also related to other syntactic and pragmatic functions, such as coordination, iconicity or anaphoricity. However, linguists who support the contrastive value of such syntactic strategies (Kimmelman 2014, Navarrete-Gonzáles *in prep.*) have provided some arguments in favour of this hypothesis. One of the more convincing arguments concerns the topic items. Indeed, in contrastive topic constituents, the spatial position has already been set in a previous piece of discourse, therefore the repetition of such a usage is no longer informative, but it is meant to bring an additional function, that is, a contrastive relationship between the items.

[19] The original example probably displays an error in the translation, since there is a mismatch between the pronoun ‘we’ and the pronoun ‘you’, but glosses reproduce the second-person plural pronoun and the first-person plural pronoun.

2.3.2.2 Syntactic distribution in sign languages

The linguistic discussion about word order in SLs and the syntactic distribution of constituents has long been debated. Some language-specific constructions, such as classifiers or role shift, have complicated the structural analysis of SLs, since these structures differ from the typical structures analysed in spoken languages. At first sight, these elements, together with the use of NMMs and a simultaneous production of content (which is physically impossible in spoken languages) have convinced some scholars (Friedman 1976 for ASL) to support a free word order hypothesis. However, other scholars (Liddle 1980, Neidle 2000 for ASL; Coerts 1994 for NGT; Sze 2003 for HKSL; Pavlič 2016 for SZJ) have observedthe presence of fixed unmarked word order patterns in SLs, which do not necessarily correspond to the respective spoken languages.

Word order is a parameter that plays an essential role in the comprehension of language, and in fact it is established very early in the acquisition process. Indeed, by acquiring the word order parameter, children can make inferences on the basis of prosodic cues (Morgan & Demuth 1996, Christophe, Nespor, Guasti, Van Ooyen 2013). Some languages allow variations in basic word order for communicative needs, for example some information structure phenomena as the managing of new and old/given information. In order to convey these pragmatic functions, constituents can be moved from their original position or base-generated outside the core of the clause structure. Moreover, these syntactic modifications can be accompanied by a change in the standard intonation contour, signalling themselves alongside the other focus or topic expressions. The next section § 2.3.2.2.1 intends to provide a cross-linguistic outline of word order patterns and to address the syntactic composition of the left periphery for SLs. On the other hand, section § 2.3.2.2.2 focuses on the specific case of LIS, by analysing word order and the syntactic composition of the left periphery with a particular attention on topicality. And finally, § 2.3.2.3 addresses the debated on the moved or base-generated nature of aboutness topic constituents which occur in the left periphery of the sentence.

2.3.2.2.1 Basic word order and syntactic manipulations in sign languages

Analysis of word order in SLs started with work on ASL in the early seventies (Fisher 1975, Friedman 1976, Liddell 1980). Investigations of the movement of constituents

within a sentence presuppose a prior knowledge of the basic and unmarked distribution of syntactic elements.

Earlier studies on ASL (Fischer 1975) have pointed out the existence of a basic pattern corresponding to the SVO word order, with the unique variations of object topicalization (O,SV) and verb phrase topicalization (VO, S). It is interesting to note that in these latter cases, topicalization produces a break between the topicalized item and the rest of the sentence. Nevertheless, Friedman (1976) contested this account, which was considered reductive, and claimed that other syntactic patterns, such as SV and OV exist in ASL, making the structure more flexible than had first been assumed. Another very widespread formula in ASL, but one which is hard to investigate, is the structure SVOV, considered again in Friedman's study and reported in the sentence below.

(93) (I) MEET DEAF MEET
'I met some deaf people'.

(ASL, Friedman 1976(b):136)

Many theories attempt to explain the right composition of such a sandwich construction. Certain hypotheses have tried to find the origin of this structure in a repetition of SOV +(S)(O)V, where the subject and object in the second structure are omitted, or by contemplating the apposition of two simple constructions SV+(S)OV, or SV + (S)V. According to Friedman's investigation, although rare, other possible orders are SOV and OSV. However, by analysing textual data, she noticed that objects in the OSV model are not separated by intonational breaks, contrary to what other scholars (Fisher 1975, Liddell 1980) have claimed.

Apart from describing different kinds of word order, Friedman (1976) did not provide any justification to support her claim; moreover, she did not admit the possible existence of SVO as a standard word order, due to its less frequent use in spontaneous data. Despite these doubts, further studies (Neidle 2000) have convincingly established the existence of a basic word order in ASL, which seems to prefer an SVO structure.

Studies of other SLs have been addressed by many scholars for tracing unmarked word order which had not yet been investigated in the literature. Some researchers have supported the existence of a mostly pragmatically driven word order, such as Deuchar (1984, 1985), who investigated sentences in BSL, supporting a topic-comment word order, whereas other studies focused on syntactic distribution, by taking into account both syntactic roles and semantic functions such as agent and patient. For example, Coerts' (1992) investigations on NGT have found that it has a SOV word order. In

particular, NGT seems to be a verb final language which tends to place agents in the first position in both reversible and irreversible sentences, although a linguistic variant in Amsterdam also displays SVO word order. Other languages displaying a prevalent SOV word order are Indo-Pakistani Sign Language (IPSL) (Zeshan 2000), German Sign Language (DGS) (Pfau 2001), Al-Sayyid Beduin Sign Language (ABSL) (Sandler, Meir, Padden, Aronoff, 2005), Japanese Sign Language (JSL) (Abe 2007), and Catalan Sign Language (LSC) (Pfau & Quer 2007).

By contrast, SLs which display a preferred SVO basic word order, besides those already described such as ASL, are Swedish Sign Language (SSL) Bergman & Wallin (1985), HKSL (Sze 2003, 2012), Brasilian Sign Language (LIBRAS) (de Quadros 2003), Russian Sign Language (Kimmelman 2012), and Slovenian Sign Language (SZJ) (Pavliĉ 2016).

Another debated linguistic issue concerns the syntactic positions of topic elements belonging to the information structure. As already pointed out in § 2.2.2.1, one of the first studies which addressed the issue of topic positions within the syntactic structure of a sentence was by Aarons (1994). She noticed that the recursion of topic expressions is allowed in ASL. However, a maximum of two topic constituents can be adjoined to the CP, and sentences with more than two topics are considered ungrammatical. She also pointed out that the composition of topics in a single sentence is not random, but fixed. According to her study, two base-generated topics (tm2 and tm3), one of which is co-indexed with one of the arguments of the verb, can co-occur; similarly, the combination of a moved and a base-generated topic (tm1 and tm2 or tm1 and tm3) can co-occur. However, the sentence is judged ungrammatical if both topics in a single sentence are moved.

From a purely syntactic analysis, she supports the hypothesis that the topic constituents in ASL occur in a position which is left-adjoined to the Complementizer Phrase (CP) called Topic Position (TP) rather than in the Specifier of CP. Indeed, topic positions are not c-commanded by the head of CP, and therefore cannot be within its domain.

Moreover, she claims that the Specifier of the CP occurs to the right of the Inflectional Phrase (IP). This theory is further supported by other studies (Neidle et al. 1999, Neidle et. al. 2000), also at a cross-linguistic level (Cecchetto et al. 2009, Branchini 2014 for LIS). Other scholars did not agree with this account and supported a different hypothesis, placing the Specifier of CP to the left of IP (Petronio & Lillo-Martin 1997) and contributing to the universality of the leftward movement (Kayne 1994).

Some contact points between the two accounts exist, for example both claim that specific NMMs are associated with wh-questions that occur simultaneously with the articulation of the manual interrogative sign. Moreover, both the leftward and the rightward hypotheses assumed the presence of syntactic movement concerning the wh-constituent in ASL. However, the rightward analysis seems to better explain how the wh-dependency is marked by wh-NMMs (for further insight into this topic see Neidle et al. 2000).

In support of this hypothesis, Neidle et al. (1998, 2000) also points out that NMMs optionally spread over the c-command domain with which they are associated, and accompany the manual material to which they refer. Ifthe manual sign with which NMMs are co-articulated is absent, the NMMs spread mandatorily. Moreover, it was noted that NMMs may vary in intensity and increase when they are closer to their original node, whilst they decrease with distance. An example of this syntactical account, first theorized by ABKN (1992) and reported by Aarons (1994), is provided below.

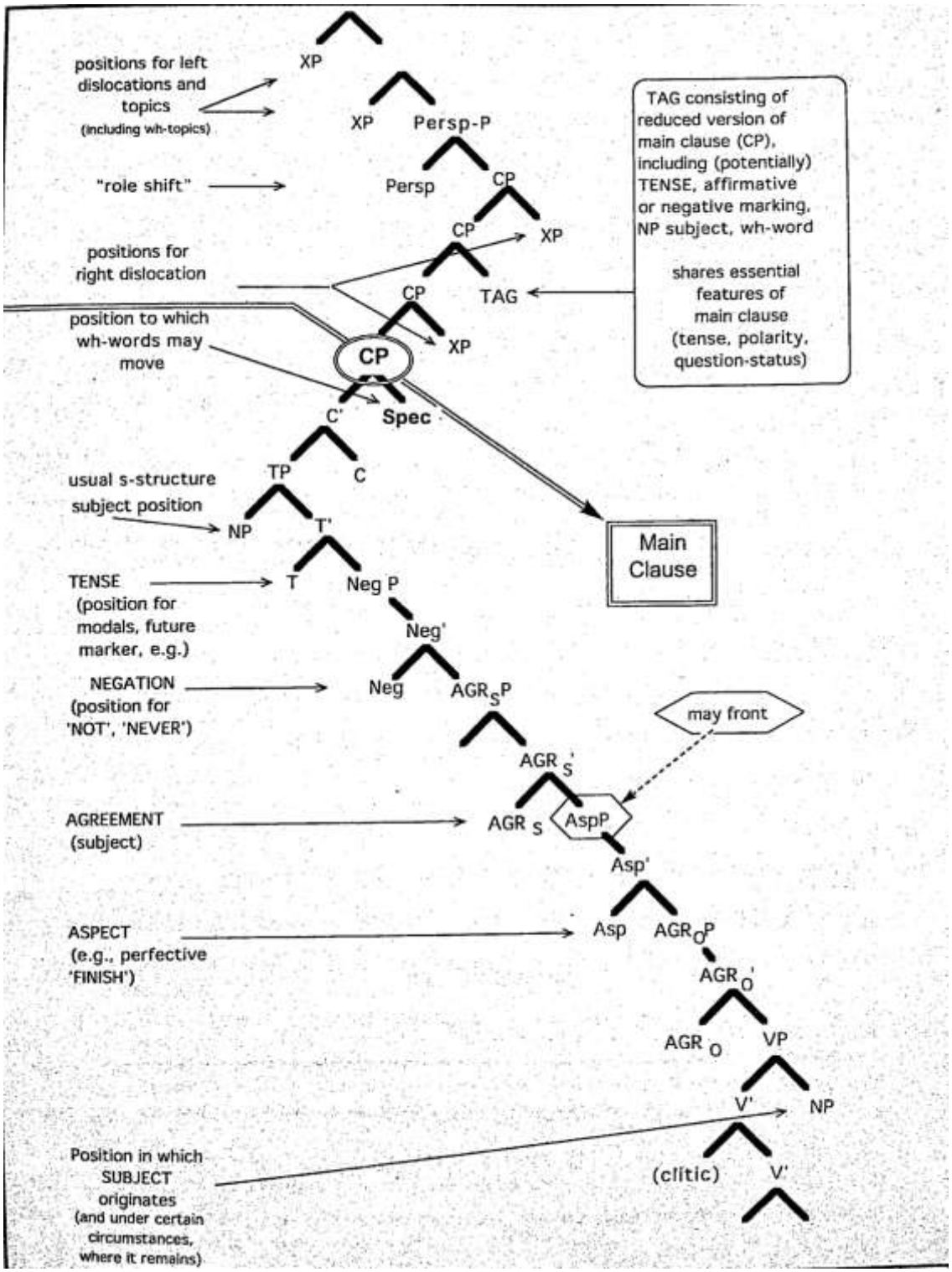


Figure 15. Syntactic structure in ASL

(Aarons 1994:55, ex.5)

According to this hypothesis, wh-words move to the right of the IP within the Spec of CP, while the topic positions, including left-dislocated topics and wh-topics, are placed to the leftmost part of the tree.

2.3.2.2.2 Basic word order and syntactic manipulations in LIS

Initial studies on LIS were conducted by Virginia Volterra and a group of researchers coming from the CNR in Rome (Volterra & al. 1984) and were further extended by Laudanna (1987), Laudanna & Volterra (1991), Geraci (2002), and Branchini & Geraci (2011).

Laudanna (1987) claimed that the most acceptable word order in LIS is SVO, however the relationship between the syntactic role and the sentence type is relevant. Indeed, in the case of a reversible sentence the word order SVO prevails, while, by contrast, in the case of irreversible sentences or classifiers, an SOV order is preferred. Geraci (2002) went a step further by analysing spontaneous data produced by both native and non-native signers in his investigation of the word order structure in LIS. Contrary to previous studies, he argued for the prevalence of a SOV unmarked word order. According to his results, SVO is in fact only detected when the object is syntactically heavy, for example when it is modified by a relative clause, or when a concept is repeated for clarity.

In their sociolinguistic study, Branchini and Geraci (2011) found that age and geographic origin are significant sociolinguistic factors in favouring one order over the other. In their investigation, relevant linguistic factors include the presence of functional elements such as aspectual markers, negation or modal verbs, and the reversibility of the predicate. As for functional variables, the results display a complex situation where the aspectual marker DONE and the verb VOLERE (WANT) displays a prevalence of SVO order, while the negations and the modal verbs DOVERE (HAVE TO/MUST) and POTERE (CAN/MAY) display a preference for SOV order. The presence of reversible predicates from a linguistic perspective trigger the predominant use of SVO, while non-reversible predicates mostly show the SOV order. From a socio-linguistic perspective it seems that signers from the central-southern cities (Rome and Bari) prefer a SVO order, while in Bologna (which is in the northern part of the nation), signers mostly use a SVO distribution. However, data from many cities in different geographical areas should also be analysed in order to provide a more reliable picture about geographic tendencies.

As for the manipulation of the syntactic structure LIS, an account similar to the hypothesis sketched by Neidle et al. 2000 is provided by Branchini (2007, 2014). Although her analysis focused on relative clauses, she hypothesized the existence of topic positions in the leftmost part of the structure, above the IP, where the relative clause can be moved from its original position, as demonstrated by the following sentence in (94) and figure (16).

(94) [CHILD$_i$ PLAY PE$_i$] TEACHER$_k$ $_k$SCOLD$_i$

'The teacher scolds the child who plays.'

(LIS, Branchini 2014: 214, ex. 420)

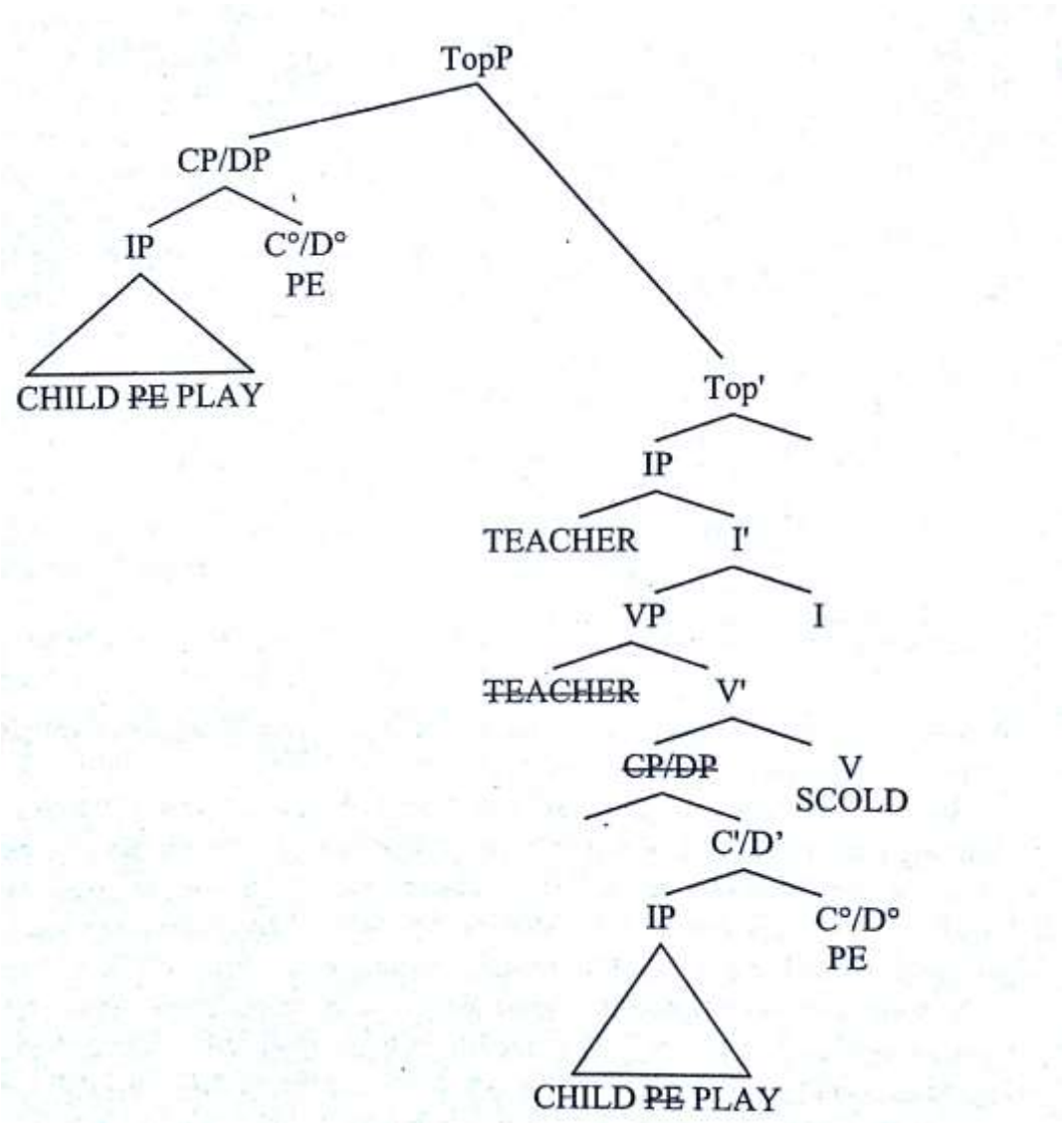


Figure 16. Syntactic structure of relatives in LIS (Branchini 2014)

(LIS, Branchini 2014:214, ex. 421)

By contrast, Brunelli (2011), while following Kayne's (1994) Antisymmetry Theory, postulated a completely different account, according to which all the projections occur to the left of the structure. In line with Rizzi (1997), he proposes a detailed structure with dedicated positions for the constituents that occur in the left periphery of the sentence, such as topics, focus and wh-expressions.

Brunelli detects the possibility that more than one topic may occur in the same sentence. An example of the sentence in question is reported below.

top top

(95) SCHOOL IX_3 TOMORROW EVENING MEETING, IX_2 IX_{loc}

'As for the school, as for the meeting tomorrow evening, will you be there?'.

(LIS, Brunelli 2011:174, ex.190a)

Although no further analysis is provided to account for this phenomenon, he recognizes that the two postulated topic positions, respectively defined as higher and lower positions, bear different features. The higher ones trigger the use of NMMs as raised eyebrows, while the data suggests that the topic constituents which are outside the scope of NMMs convey presupposed information. The figure below displays this account.

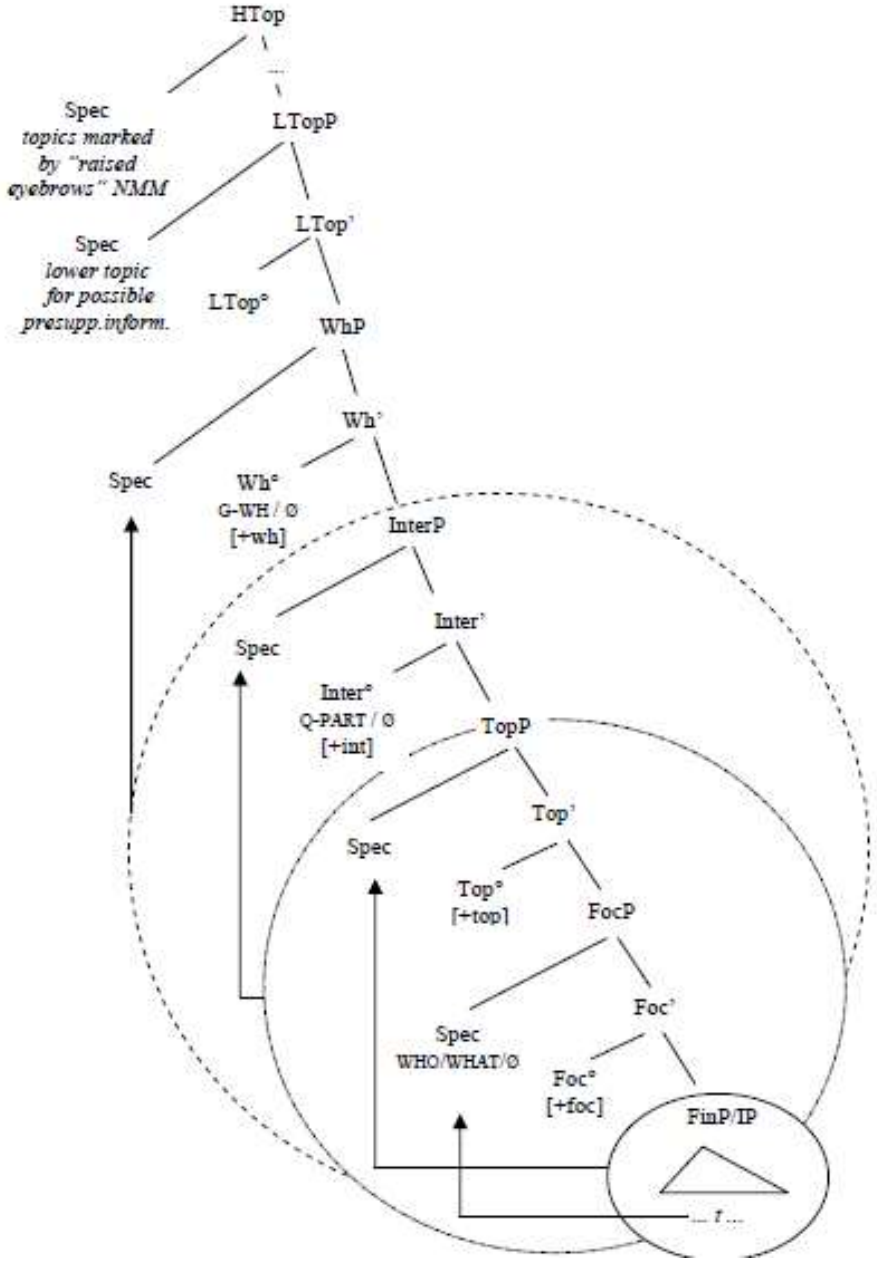


Figure 17. Different topic projections above WhP in LIS (Brunelli 2011).

(LIS, Brunelli 2011:220, example 219)

He explicitly doesn't address the issue of the moved or merged nature of such topic constituents in the left periphery of the structure, and other researchers have not specifically addressed this question regarding topic constituents.

2.3.2.3 Base-generated or moved nature of aboutness topics

Starting from the earliest analysis of topic placed in the left periphery of a sentence, Coulter (1979) argues that in ASL topicalized elements can be both moved or base-generated in the leftmost part of the clause. In the case of moved topics, he notices a grammatical co-indexation which is attested by the trace left in the position where the moved constituent was, as reported in the example below:

(96) **JOHN$_i$** , MARY LOVE t_i
'Mary loves John'.

(ASL, Aarons 1994:52, example 4)

By contrast, the topic item is considered base-generated if it is grammatically related to the main sentence, as displayed in the example below:

(97) **JOHN$_i$** , MARY LOVE IX_{3i}
'Mary loves John'.

(ASL, Aarons 1994:52, example 5)

Lillo-Martin & Petronio (1997) did not distinguish between the base-generated and moved natures of analysed constituents, instead labelling topic in the left periphery of the sentence with the general category of topicalization. By contrast, a more detailed structural analysis was carried out by Aarons (1994): in her study topic types may be differentiated syntactically and prosodically depending on their moved or base-generated nature. The topics she accounted for as only being semantically related to the structure, and which the current study has considered as hanging topics, are clearly instances of base-generated topics. Indeed, since they do not consist of arguments of the predicate it is not possible that an extraction has taken place from a specific point within the sentence.

Similarly, topic types which have been observed as co-referential with one argument within the clause, for example by means of overt or covert co-indexation strategy, are considered to be base-generated as well. Indeed, as in other studies in spoken languages (Benincà & Poletto 2004, Giorgi 2015), the argument of the main verb is considered to be the indexed item, therefore the topic item should be addressed as generated outside the sentence structure. However, some scholars do not consider pronouns a reliable diagnostic for verifying the base-generated nature of topics (Kiss 1995). Examples of these two topic types investigated by Aarons are reported below in (98) and (99) respectively.

(98) **VEGETABLE**, JOHN LIKE CORN
'As for vegetable, John likes corn'.

(ASL, Aarons 1994:160, ex. 28b)

(99) **JOHN**, IX_{3i} LOVE MARY
'(You know) John, he loves Mary'.

(ASL, Aarons 1994:165, ex. 35)

In the latter case, the base-generated topic may be co-referential both with the subject or the object of the sentence.
Moved topics, according to Aarons (1994) are those topics which leave a trace in their original argumental position, as displayed in (100) below.

(100) **MARY**$_i$, JOHN LOVE t_i
'Mary, John loves'.

(ASL, Aarons 1994:165, ex. 35)

However, as stated in the introduction, the difference between these types of topic and the previous base-generated topics, which syntactically co-referred with an overt or covert pronoun in the main structure, is unclear. Moreover, Aarons only provides prosodic justification for explaining the different structure. According to her analysis, NMMs that accompany base-generated topics are different from those accompanying moved topics and this is enough to explain the different syntactic structure of the two topic types.

As highlighted before, this reliance on prosodic cues risks being tautological, and more evidence would be necessary in order to demonstrate the difference between these constructions. Moreover, Aarons did not display a sufficient range of data for comparing the phenomena, and in fact only considered a few sentences.
Moved topics are also confusing from a pragmatic point of view, since Aaron's work specified that they occur in two different contexts. The first is a restricted universe of

discourse, among which they represent a member of the set, and the second is an emphatic context where the topic item also takes on a contrastive function.

Later studies (Neidle 2000, 2002) have proven that the moved topic type is better addressed as a focus rather than a topic and this new interpretation more readily explains the moved nature of these elements. In order to address the nature of topic types more thoroughly, Van Gijn (2004) carried out a study on NGT in which he applied the test of subjacency.[20] He suggests that topics in NGT are always base-generated, since they do not show subjacency effects. Moreover, a resumptive pronoun may be overtly used with these types of topics. However, in sentences where the pronoun is absent, he demonstrates that it is possible to insert overt indexical elements (that co-refer to the topic element in the left periphery) into the complement sentence.
An example extracted from his investigation is provided below:

top

(101) **BOOK** **POINT$_{\textbf{right}}$** TWO.OF.US YESTERDAY $_{\text{signer}}$SEE$_{\text{opposite.of.signer}}$ MAN POINT$_{\text{opposite.of.signer}}$ STEAL **POINT**$_{\text{right}}$

(NGT, Van Gijn 2004:167, ex. 26b)

Van Gijn's analysis provides further evidence to support the base-generated hypothesis of topic expressions, however subjacency applied to weak islands is not a completely reliable test for detecting movement, since it tests boundaries which do not always trigger strong ungrammatical effects in cases of moved constituents. Better tools, such as strong islands, can be used for testing movement operations. Strong islands create boundaries which are harder to cross, for example the case of extraction from relative clauses boundaries. Indeed, the syntactic relationships in these structures are stronger and they represent a more reliable syntactic test for establishing the nature of constituents (for further information on this topic, see Ross (1984)).

According to Kimmelman's (2014) analysis, aboutness topics in NGT and RSL are separated from the rest of the sentence by means of prosodic boundaries, and they are likely to be considered base-generated topics. This may be further proven by the presence in the clause of a co-referential pronoun, which may function as a resumptive pronoun. However, no further investigation was carried out in his study, since arguments such as these exceeded the scope and purpose of his research.

[20] Subjacency is a universal condition which relates to wh-movement. According to Chomsky (1977), the subjacency principle states that a wh-movement cannot cross more than one bounding node at the same time. Bounding nodes are considered clauses or nominal phrase boundaries, but their definition may be subject to language-specific variations.

As for LIS, one of the few notes about the syntactic movement of topic constituents was expressed in Geraci, Cecchetto & Zucchi (2008). They analyse left peripheral complements as base-generated adjunct topics with a resumptive pronoun or a null pronoun. This analysis also accounted for the use of the NMM raised eyebrows, as in the example below:

top

(102) **PIERO CAR STEAL** MARIA PE TELL

'Maria said that Piero stole a car.'

(LIS, Geraci et al. 2008:49, ex. 8b)

The following schema in Figure (18) was sketched to explain the analysis of the left peripheral components.

a. $[_{CP} \ldots [_{topic}\ O_{sentential}] [_{IP}\ S\ pro\ V]$
b. $[_{CP} \ldots [_{topic}\ O_{sentential}] [_{IP}\ S\ PE_{resumptive\ pronoun}\ V]$

Figure 18. Analysis of the left peripheral components

(LIS, Geraci et al. 2008:53, ex.20)

More data is needed to analyse a wider variety of syntactic properties within topicality in LIS and more research is required in order to better address these phenomena.

2.3.3 Prosodic markers: Manuals (MMs) and Non-Manuals (NMMs)

In common communication, facial expressions and body movements may convey conversational or affective values, for example expressing surprise or signalling a particular emphasis on certain words or a string of words.
Despite these paralinguistic functions, several studies have demonstrated that these components in sign languages also fulfil purely linguistic functions (Baker-Shenk 1983, Pfau & Quer 2010).

Facial expressions and movements which concern the head and the body of the signer are defined in the literature as Non-Manual Markers (NMMs). NMMs in the literature have not yet received the necessary attention, and early studies effectively considered them from a merely descriptive point of view. Although the discussion surrounding NMMs is still complex, further studies at a cross-linguistic level have started to distinguish specific grammatical functions of these components, singling out lexical,

prosodic, morpho-syntactic, and pragmatic values (Baker-Shenk 1983, Liddell 2003, Neidle et al. 2000 for ASL, Pfau & Quer 2010 for a broad overview).

NMMs fulfil lexical roles when they are related to the inherent meaning of a sign, for example the sign HAPPY must be produced while smiling, and the sign FAT has to be produced with puffed out cheeks, as respectively displayed in the two pictures below.

Figure 19. HAPPY

Figure 20. FAT

In SLs, NMMs may correspond to the intonation contour that accompanies clauses or words in spoken language, therefore they also fulfil prosodic functions by conveying pitch accent or specific sentential intonation. In the example (103) and the figure (21) below the distribution of intonational markers is aligned with the two intonational phrases (I). In particular, raised eyebrows (re), squinted eyes (sq) and head forward (hf) mark the first intonational phrase, whilst head up (hu) and head back (hb) mark the second.

Figure 21. ‘If the goalkeeper had caught the ball, (the team) would have won the game’.

re, sq, hf hu-hb

(103) [IF GOALKEEPER HE CATCH-BALL]$_I$ [WIN GAME WIN]$_I$

‘If the goalkeeper had caught the ball, (the team) would have won the game’.

(ISL, adapted from Dachkovsky & Sandler 2009: 292, figure 1)

Moreover, NMMs can convey morphological meaning, for example fulfilling the role of an augmentative marker. Indeed, the difference between the sign BOX and BIG BOX is only based on the presence of dedicated NMMs which consist of furrowed eyebrows and teeth on the lower lip, as stated by Fornasiero (to appear), and displayed below in Figure (22). In this case, NMMs have morphological functions since they act as a morpheme and convey adjectival information.

Figure 22. BIG BOX

Syntactically, these NMMs can function as signals for identifying specific types of sentence, such as the distinction between statements and questions, or subordinations, for example the expression of a relative clause, as shown in the sentence (89) reported in (104) below:

rel

(104) [CHILD$_i$ PLAY PE$_i$] TEACHER$_k$ $_k$SCOLD$_i$

‘The teacher scolds the child who plays.’

(LIS, Branchini 2014: 214, ex. 420)

Pragmatic functions are also fulfilled by NMMs, in the case of focus or emphasis, or when they refer to the cognitive status of old/given information. As shown below, where the focus marker raised eyebrows (re) only accompanies the focus object ASL.

Figure 23. 'He study ASL'

(105) Question: Which language did your brother learn?
foc
IX_{left} ASL STUDY
'He study ASL'.
(NGT, adapted from Crasborn & van der Koij 2013: 539, figure 7a)

Concerning the analysis of topicality, these elements have been analysed by sign language researchers as morphological or syntactical elements (Neidle et al. 2000), or as prosodic cues and intonation means (Sandler & Lillo-Martin 2006). Leaving aside a comprehensive account of this debate, the current dissertation describes the uses of NMMs in relation to both their prosodic and morpho-syntactic functions.

The following sections provide a more accurate analysis of prosodic contours, which according to previous studies seem to frequently accompany different topic types. The existence of specific topic type markers is not straightforward, and a clear direct correspondence between form and function should not necessarily be expected. Indeed, previous studies have found similarities between types of topics, such as aboutness and scene-setting topics, proving the probable existence of a macro-category of topics equally signalled in SLs (Kimmelman 2014). Nonetheless, it is interesting to investigate the possibility that in the spirit of Frascarelli & Hinterhölzl (2007) some differences arise among the three types of topics considered.

§ 2.3.3.1 briefly outlines the NMMs which have been related to topicality in previous studies across SLs, in particular raised eyebrows (§ 2.3.3.1.1.), squinted eyes (§ 2.3.3.1.2.), head forward and head tilt back (§ 2.3.3.1.3.), body movements (§

2.3.3.1.4.), and the prosodic boundary markers (§ 2.3.3.1.5): eye blink (§ 2.3.3.1.5.1) and head nod (§ 2.3.3.1.5.2) are considered. Meanwhile, by referring to previous studies in the literature on SLs, § 2.3.3.2 addresses the presence of NMMs and their relation to the three considered topic types: aboutness topics (§ 2.3.3.2.1.), scene-setting topics (§ 2.3.3.2.2.) and contrastive topics (§ 2.3.3.2.3.).

2.3.3.1 Non-manual markers (NMMs) in topicality

Liddell's (1980) intuition in addressing topicality in ASL was that beside syntactic properties, prosodic cues such as facial expressions, head and body positions may contribute to the interpretation of topic constituents. Similarly, research on these elements in ASL started to explore different aspects of the correlation between topichood and NMMs (Baker-Shenk 1983; Wilbur & Patschke 1999; Wilbur 2012).

Many other scholars in various countries have investigated these components, particularly by looking at their co-occurrence with other syntactic and pragmatic topic functions (among others, Coerts 1992 for NGT, Sze 2008 for HKSL, Kimmelman 2014 for RSL and NGT, Kimmelman & Pfau 2016 for a general overview, Barberà 2015 and Navarrete-Gonzáles *in prep*. for LSC). In particular, in line with other pieces of research (Neidle et al. 2002 for ASL, Checchetto, Geraci & Zucchi 2006 for LIS, 2009, Pfau & Quer 2007, Branchini 2014), syntactic NMMs are supposed to be combined with syntactic features, which are placed in the head of functional projections.

As for LIS, it was Franchi ([1987] 2004) who first supported the introduction of facial expressions as a fifth parameter in LIS, after the four theorized by Stokoe (1960) and other scholars (Sandler and Lillo-Martin, 2006). She also claimed that NMMs are responsible for the creation of minimal pairs in LIS. Subsequently, a significant number of studies have investigated this parameter in LIS (Fontana 2008; Ajello, Mazzoni & Nicolai 2001; Fontana & Raniolo 2015; Conte, Santoro, Geraci & Cardinaletti 2011, a.o.). However, an exhaustive compendium of NMMs is still lacking in LIS, therefore the following section is intended to offer a general description of the NMMs which have been correlated to topicality in the literature on LIS.

2.3.3.1.1. Raised eyebrows

The marker of raised eyebrows consists of an upward movement of the eyebrows, as illustrated in Figure (24).

Figure 24. Raised eyebrows

This marker generally fulfils conversational functions, such as placing emphasis on a word or an uttered string of words, or signalling surprise. It may also function as a punctuation marker, or be aligned with pitch-accent for the purpose of reinforcing what is said (Ekman & Oster 1979, Cavé et al. 1996, Krahmer et al. 2002). Despite the communicative or affective values, several studies have demonstrated that raised eyebrows in SLs also fulfil linguistic functions (Baker-Shenk 1983, Pfau & Quer 2010). Although the distinction is not always straightforward, scholars have noticed that in the case of linguistic functions, raised eyebrows have a precise inset and outset that is aligned with the correspondent structure or manual sign (Baker-Shenk 1983).

Dachkovsky and Sandler (2009) have argued that in ISL, raised eyebrows signal continuation and forward directionality, reflecting dependency relations between phrases and clauses. This means that phonological intonation phrases stressed by raised eyebrows need to be followed by other constituents produced by either the same interlocutor or another, such as in yes/no questions. Supporting this prosodic approach, some studies have also associated these non-manuals with the high boundary tone in spoken languages, comparing these strategies to the ways in which some languages mark prosodic intonation (Dachovsky 2005, Sandler 2010).

By contrast, although it does not rule out the possibility of accounting for raised eyebrows as an intonational marker, Wilbur & Patschke's (1999) analysis forcefully claims that this marker directly relates to syntax. They also exclude the possibility that this marker entertains a straightforward correlation with pragmatic functions, providing, for example, background information (Coulter 1979). Like other functions, raised eyebrows occur cross-linguistically as a topical marker, despite not being mandatory (Liddell 1980 for ASL, Coerts for NGT 1992, Sze 2008 for HKSL, Kimmelman for NGT and RSL).

Incroporating certain research carried out into ASL (Neidle et al. 2000), Cecchetto et al. (2009) have tried to unify the prosodic and syntactic approach in LIS by supporting the hypothesis that the marker raised eyebrows, like other NMMs, has an intonational status but can also be used as a diagnostic tool for detecting syntactic phenomena. This approach is defined as isomorphic. According to those scholars who support the prosodic approach (Sandler 2010), which is a non-isomorphic approach, such an unmediated hypothesis between prosody and syntax risks ignoring the discrepancies between syntax and prosody. However, despite the theoretical concerns about this theory, the isomorphic approach seems to better account for specific phenomena, such as the basic position of wh-expressions and the direction of its syntactic movement, which could be elegantly explained by the distribution of NMMs across the sentence.

Building on the same isomorphic account, Branchini (2007; 2014) noticed that in LIS this marker usually accompanies relative clauses and specific topic positions (Geraci et al. 2009, Brunelli 2011, Branchini 2014). The sentence below displays a case of topic marked by raised eyebrows:

re wh
(106) EXAM LIS, PAOLO ARRIVE AFTER SAY WHO
'As for the LIS exam, who said that Paolo arrived later on?'.
(LIS, adapted from Brunelli 2011:216, ex. 217)

The question of non-isomorphic account versus isomorphic account will not be further developed here. It will be left aside for the remainder of this research.

2.3.3.1.2. Squinted eyes

The marker of squinted eyes consists of ocular tension, as displayed in Figure (25). It may appear as a scalar marker, which means it may vary in intensity depending on the linguistic material with which it co-occurs.

Figure 25. Squinted eyes

Similarly to raised eyebrows, it also covers several linguistic functions across sign languages. In many SLs, squinted eyes marks restrictive relative clauses (Dachkovsky & Sandler 2009; Brunelli 2011; Kubuş & Nuhbalaoğlu 2018), and may also be used as a signal for time adverbials or time clauses referring to the remote past, or in counterfactual conditionals (Dachkovsky 2005). However, despite all these functions, some studies (Engberg-Pedersen 1990, Dachkovsky and Sandler 2009) have singled it out as a specific topic marker. In line with Engberg-Pedersen for DSL (1990), Dachkovsky and Sandler (2009) have argued that it could be associated with the retrievability of constituents whose status is negotiated between the interlocutor and the addresses in ISL. Indeed, it marks mutually shared information which is not currently prominent in the discourse and therefore presents problems for accessibility.

In LIS, this marker has been noted by Branchini (2014) as signalling shared information appearing with sentence-initial relative clauses and with topicalized constituents, as reported below. This marker may be realized together with other NMMs, such as raised eyebrows and with tension of the cheeks:

sq

(107) YES, CAR SILVER, IX_1 SEE DONE

'The silver car, I saw it.'

(LIS, adapted from Branchini 2014: 200, ex. 387)

2.3.3.1.3. Head tilt back and forward

Head tilt back consists of a rapid backward movement of the head, while head tilt forward consists of a forward motion of the head, as displayed in the two figures (26a) and (26b) below.

Figure 26a. Head tilt back

Figure 26b. Head tilt forward

Since his earlier research, Liddell (1980) has analysed head tilt back as a marker involved in signalling topic expressions in ASL. According to Liddell, a topic expression and a question only differ for head and body position. In his study on ASL (Liddell 1980:79), topics are marked by raised eyebrows and slight backward head tilt, while direct questions are marked by raised eyebrows and head forward. However, through this approach, Liddell risks the aforementioned tautological circle, where different pragmatic phenomena are only distinguished on the basis of NMMs. In her analysis on ASL, Aarons (1994) also notes the presence of head tilt back in two types of topic (Tm1 and Tm2), taking into consideration the combination of this marker with others.

Further analyses (Kimmelman 2014 for NGT and RSL) have reported backward (Figure 26a) and forward (Figure 26b) head tilts both marking scene-setting and aboutness topics in NGT and RSL. Since head tilt back could be accompanied by raised eyebrows, and can mark both topic types, Kimmelman (2014) has postulated that this marker may be the realization of the same prosodic feature. This is parallel to the phonological features in spoken languages, which can have different phonetic realizations.

As for LIS, Zucchi et al. (2010) report backward head movements to accompany expressions of time referred to the past, while forward head movements convey future expressions. A forward head tilt seems to occur with conditional clauses (Branchini & Donati 2007) and relative clauses, along with raised eyebrows and tension of the eyes and cheeks. However, further research is needed in order to propose generalizations on the uses of these NMMs.

2.3.3.1.4. Body movements

These non-manual markers consist of either a rightward/leftward or a backward/forward displacement of the body, and they may be produced with slight movements or be more exaggerated (Figure 27-28). The manner and emphasis with which this marker is realized can be related to expressive or emphatic functions, or it can be affected by individual changes, depending on the signer.

Figure 27. Left and right movement of the body

Figure 28. Backward and forward movements of the body

This non-manual has been analysed as a marker for signalling contrastivity from the early studies on ASL (Liddell 1980, Wilbur and Patschke 1998) as well as in later cross-linguistic studies (Crasborn & Van der Kooij 2013 for NGT, Barberà 2015 and

Navarrete-Gonzáles *in prep*. for LSC). Liddell (1980) notices that forward head and lean also mark yes/no questions.

From a prosodic perspective, this NMM seems to mark the opposition between stressed and unstressed signs. Although, from a syntactic point of view, backward and forward leanss respectively mark the opposition between the exclusion and inclusion of the signer in the discourse (in relation to different structures such as pronominal elements, quantifiers or nominal phrases), they have also been detected as markers for coordination (Zorzi 2018 for LSC), as respectively displayed in the two examples (108) and (109) below:

lean back lean back

(108) KIM **THOSE-TWO** CL:two-go DRAMA FOR SINGING PART; **IX_1**
CAN'T SING, NO GOOD IX_1.
'Kim and Tom, but not me –I can't sing- tried out for the singing role'.
(ASL, Wilbur & Patschke 1998: 291, ex. 16)

lean right lean left

(109) MARINA PIZZA EAT ICE CREAM BUY
'Marina will eat pizza and will buy an ice-cream'.
(LSC, adapted from Zorzi 2018: 109, ex. 117)

Moreover, when considering the pragmatic domain, it is possible to evaluate this marker either as occurring in affirmation or in negation/denial of a proposition (Wilbur and Patschke 1998). With this in mind, these elements have been considered as non-manual morphemes in stressing the macro-category of contrast. Other studies (Coerts 1992 for NGT, Sze 2008 for HKSL, Crasborn & Van der Kooij 2013 for NGT, Kimmelman 2014 for NGT and RSL) have since investigated their relationships, recognizing this marker as a signal for contrastive focussed elements, with the only difference being that some languages such as NGT display a preference for rightward-leftward rather than for backward-forward movements. Examples of such uses are shown in § 2.3.3.2.3, which addresses contrastive topics in more detail.

No specific research has been carried out into contrastive markers in LIS, and new studies are required in order to better address this phenomenon. The current research is intended to provide a preliminary account of the topic constituents receiving a contrastive value.

2.3.3.1.5. Prosodic boundary markers

Cross-linguistically, besides the specific intonation contour, sometimes constituents appear to be divided from the remaining parts of the sentence by prosodic boundaries, namely those punctual facial expressions which have been grammaticalized and which function as involuntary cues in signalling the final part of a constituent or the boundaries of a sentence.

Early studies in ASL detected such strategies but remained vague in defining them. When considering prosodic breaks, Fisher (1975), indistinctly included pauses, raised eyebrows, head tilts and numerous other cues. Liddell (1980) tries to be more precise, explaining this phenomenon as the change which occurs between the prosodic contour accompanying topic expressions (slight head tilt back and raised eyebrows) and the prosodic markers signalling the remaining part of the sentence. However, intonational breaks cannot be purely accounted for as a change in manual expressions, and further studies have provided evidence for the existence of specific non-manual boundary markers which signal a break after a constituent or after the end of a clause.

As in spoken languages, sign languages show a hierarchical organization of prosodic domains (Sandler 2008). Thus, syllables are organized into feet, and feet form prosodic words, which create phonological phrases, intonational phrases and utterances. An intonational phrase is the unit marked by a perceptible break, also called an intonation break. It marks clauses or other constituents, most saliently parentheticals, non-restrictive relative clauses and topics or extraposed elements. As Sandler (1999, 2008) has pointed out, final intonation phrase boundaries are marked by the same cues as phonological phrase boundaries: larger size and slower articulation of the last sign. However, two cross-linguistically widespread markers for boundaries are a change in head and/or body position or posture, which may occur together with a punctual eye blink at the juncture between two intonational phrases (Nespor & Sandler 1999, Sandler 2008 for ISL, in Wilbur 2000, Pfau & Quer 2010, Sze 2008 for HKSL, Kimmelman 2014 for NGT and RSL).

In the following sections, the two non-manual markers of eye blink and head nod are analysed in depth.

2.3.3.1.5.1. Eye blink

The marker eye blink consists of a rapid closure and opening of the eye and can have several realizations (Figure 29).

Figure 29. Eye blink.

Three types have been specifically analysed: reflexive eye blink, involuntary or periodic eye blink, and voluntary eye blink (Wilbur 1994). According to Wilbur (1994), the involuntary and voluntary eye blink may serve linguistic functions. In particular, it seems that the involuntary blink functions as a boundary marker, and that the voluntary blink accompanies lexical signs. In her work, only boundary blinks are taken into account. Wilbur (1994) demonstrates that the periodic eye blink consistently occurs in the final part of a syntactic structure, signalling the end of an Intonational Phrase.

Sandler (2008) claimes that blinking in a signer is comparable to biological breathing for a speaker as an intonation boundary marker. In contrast to this hypothesis, Crasborn et al. (2009) proposes a correlation between blinking and low-level articulatory processes. Indeed, the psychological and physiological status of these phenomena has not been investigated thoroughly enough thus far.

More recently, a study (Tang et al. 2010) compared the marker of eye blink in four signed languages: Hong Kong Sign Language (HKSL), Japanese Sign Language (JSL), Swiss German Sign Language (DSGS), and American Sign Language (ASL), detecting certain cross-linguistic variations in the use of a blink as a boundary marker. Specifically, they noted that, cross-linguistically, the use of eye blink strongly correlates with the edge of Intonational Phrases, although these domains are also recognizable without it. Moreover, HKSL signers have a higher eye blink rate than the other SLs taken into consideration. They also detected other strategies used in concomitance with this marker: lengthening of the last part of the sign was more common in HKSL, DSGS

and ASL, while JSL predominantly displayed the use of head nod together with eye blink.

According to Kimmelman (2014), eye blink (Figure 29) and a rapid head nod (Figure 30) are also used in NGT and RSL to mark the prosodic boundaries of topic constituents. They are likely used in order to mark a break with the rest of the clause. As subjects in unmarked contexts are not normally separated from the rest of the sentence, this prosodic break after the sentence-initial items may syntactically reflect the difference between the topic position and the subject position.

Similarly, research on LIS has reported the use of this marker as a prosodic cue for signalling the edge of the sentence or the edge of constituent domains and intonational phrases in specific syntactic structures, such as in appositive relative clauses or parenthetical structures (Branchini 2014). These constructions differ greatly from typical relative clauses and display the use of both an eye blink and head nod, as seen in the example below:

eyeblink eyeblink
nod nod
(110) MARIA [CAKE COOK LIKE] PREPARE DONE
'Maria, who likes to cook cakes, has prepared one.'
(Branchini 2014: 231, ex. 468)

The use of head nod is further addressed in the next section.

2.3.3.1.5.2. Head nod

The prosodic marker of head nod consists of a movement in which the head is tilted up and down on the vertical plane (Figure 30).

Figure 30. Head nod.

In the past, Liddell (1980) has pointed out the syntactic function of head nod as a prosodic device for accompanying syntactic structures such as topicalization. According to his analysis, it seems that the topicalized verb phrase in particular requires a head nod marker on the subject, while, by contrast, the topicalized object does not require any head nod. The example (111) is taken from Liddell:

(111) CHASE CAT DOG
t hn
'As for chasing the cat, the dog did it'.

(Liddell 1980:30, ex.24)

Liddell accounts for this marker as a linguistic strategy fulfilling existential predicative functions, such as the verbs "be" or "do" in English. However, further studies have proven its role as an edge boundary marker similar to eye blink. (Pfau & Quer 2010). Some scholars (Crasborn & Van der Koij 2013, Kimmelman 2014) have noticed the co-occurrence of this marker with focus elements, differentiating between large nod and small nod. The first has a larger trajectory and is mostly single, while small nods are generally shorter and repeated. In both cases, this marker may accompany or follow a constituent. However, this strategy is not only used for separating focus elements from the remaining part of the sentence, because a correlation between head nod and topicality was also found (Kimmelman 2014). Sze (2008) for HKSL, following Sandler (1999), more generally analysed the changes in head position as intonational breaks, particularly in fronted topic objects, fronted non-topic objects with negation, and contrastive contexts.

Kimmelman (2014), for NGT and RSL, also detected the same marker, a head nod (hn), together with a long pause separating the topic constituent (top) from the comment, as displayed in the example (112) below:

(112) IX CAT / WINDOW IX HOUSE
top hn
'A cat is in the window of a house'.

(NGT, Kimmelman 2014:66, ex.32)

As displayed above, such boundary markers have also been observed in LIS in specific relative or parenthetical constructions, signalling a pause between the relative and the matrix clause (see § 2.3.3.1.5).

2.3.3.2 Manual Markers (MMs) and Non-Manual Markers (NMMs) applied to sentence topic types

Some scholars (Aarons 1994 for ASL; Sze 2011 for HKSL; Kimmelman 2014 for RSL and NGT; Kimmelman & Pfau 2016 for a general overview) have theorized that specific intonation patterns may correspond to different topic types. The following sections present previous studies carried out on the prosodic contours accompanying aboutness topics (§2.3.3.2.1), scene-setting topics (§2.3.3.2.2) and contrastive topics (§2.3.3.2.3).

2.3.3.2.1 Prosodic features of aboutness topics in sign languages

In his study on ASL, Liddell (1980) identifies a variation in the realization of the sign in terms of time of production. According to him, sentence-initial topic expressions last one fifth of a second longer than sentence-initial non-topic expressions. Moreover, he singles out a set of NMMs which accompany the topic item: a slight backward head tilt (htb) and raised eyebrows (re). Both arguments, subjects, objects, and predicates may be frontalized and are generally separated by an intonational break.

McIntire (1980) also detected the presence of NMMs accompanying topic constituents in ASL in the first part of a sentence; in particular, raised eyebrows seems to signal topicalized elements.

Engberg-Pedersen (1993), analysing Danish Sign Language (DSL) topicalized constituents, noted that they are marked in the following way: "the chin is pulled back or lowered, the eyes are squinted or the brows are raised or both features co-occur, the muscle of the upper lip may be contracted, and at the end of the topicalized constituent, there may be a head nod" (Engberg-Pedersen 1993: 42). In cases of co-occurrence of two topicalized constituents, a slight change in the head position arises. Squinting may be used with referential items placed in the middle of the clause, signalling a reference check, meaning that the signer wants to indicate to the receiver how easily she can retrieve such a constituent. The descriptions of these topic types can be ascribed to the presence of aboutness topic markers. An example and the correspondent illustration (31) are reported below, where it is possible to notice the chin lowered, and a slight tension of the eyes over the topic constituent (t) in (113) below.

(113) <u>t</u>
DET CAT / SLEEP

‘The cat, it’ s asleep.’

(DSL, adapted from Engberg-Pedersen 1993:121, ex. 3)

Figure 31. DET CAT SLEEP

(DSL, Engberg-Pedersen 1993:380, figure 27)

As previously mentioned, Aarons (1994) first singled out three different prosodic contours accompanying different types of topic. Excluding the first type of topic, which was later proven to be accountable as a contrastive focus (Neidle et al. 2002), the two potential aboutness topics in Aarons are: the second type of topic, which is base-generated and only bears a semantic relationship with the rest of the clause. It is accompanied by the marker raised eyebrows and a single head movement with a backward head tilt followed by a downward head tilt, as displayed in the picture (32) below:

Figure 32. Beginning of marking End of marking

(ASL, Aarons 1994:161, figure 21)

The third topic type is again base-generated, but syntactically bound to the comment. It is marked by the upper lip being raised and the mouth open, together with eyes wide open with a fixed gaze, as in the reported picture (33) below:

Figure 33. Beginning of marking End of marking

(ASL, Aarons 1994:164, figure 22)

Wilbur and Paschke (1999), and Wilbur (2000) for ASL, also noticed the use of raised eyebrows in left-dislocated topics.

As in HKSL, according to the results discussed by Sze (2008, 2011), clause-external aboutness topics (hanging topics, left-dislocated topics and fronted object topics) are not accompanied by any specific NMM, nor are they consistently followed by a prosodic break.

Unlike HKSL, however, while investigating NGT and RSL Kimmelman (2014) has stated that both aboutness and scene-setting topics are accompanied by raised eyebrows and backward head tilt, although this is not mandatory. However, the marker raised eyebrows is difficult to analyse, since many linguistic and non-linguistic variables may overlap with each other and affect this movement. Kimmelman (2014) has distinguished between the linguistic functions of this marker with respect to the aboutness topic type. He notices that the eyebrow raising movement is clearly aligned with the topic expression and accompanies a high percentage of marked aboutness topics in both NGT and RSL. Specifically, he observes that raised eyebrows in both NGT and RSL appear as a marker for topic shifts, namely, it co-occurs with those topics which have been reintroduced after a previous mention in the discourse. Both backward and sideward head tilts accompany aboutness and scene-setting topics, similarly to the marker raised eyebrows. As mentioned before, this leads one to postulate the possibility of a macro-phonological unit which is composed of different phonetic realizations for indicating topicality in both NGT and RSL.

Despite the optional nature of such markers, a more common strategy linguistically signals the presence of aboutness topic constituents. This strategy requires the separation of the topic item from the remaining part of the sentence by means of prosodic boundary signals, such as a pause or a change in NMMs, so that, for example,

the topic remains unmarked and outside the prosodic scope of the comment. Eye blink and head nod may also appear, functioning as prosodic boundary markers.

In LIS, the research carried out by Brunelli (2011) argues for the presence of raised eyebrows over the higher topic in the structure, as displayed in the example (114), reproduced here for clarity:

re wh
(114) EXAM LIS, PAOLO ARRIVE AFTER SAY WHO
'As for the LIS exam who said that Paolo arrived later on?'.
(adapted from Brunelli 2011:216, ex. 217)

2.3.3.2.2 Prosodic features of scene-setting topics in sign languages

When analysing ASL data, McIntire (1980) noticed that an eye blink (eb) separated the scene-setting constituents (sst) (which she considers an aboutness topic) from the remaining part of the sentence, as displayed in the complex structure of (115), reported below:

sst eb
(115) $SEE_{S\text{-}L}$ pro_{3L} TABLE pro_{3L} BOWL APPLE clfr clfr:1-GO_L TAKE 'BITE APPLE GO-ON
'See those apples in the bowl on the table well, go get one and eat it, go ahead'.
(recreated from McIntire 1980:52, ex. 31)

Similarly, head nod (hn) may be a marker separating locatives from the rest of the sentence, as displayed in the example below.

sst hn
(116) $There_L$ $SHELF_{pl}$ DOLL ANIMAL CL $there_L$ ONE BEAR CL:V-stand
'In the shelves // dolls and animals are on them. One bear stands there.
(ASL, adapted from McIntire 1980:52, ex. 35')

As for HKSL, a high percentage of scene-setting topics, unlike aboutness topics, are marked by raised eyebrows and specific head positions (Sze 2008, 2011).

Three particular types of scene-setting topics (NPs which express temporal information, locative expressions and sentence-initial subordinate clauses) are usually associated with raised eyebrows (re), according to Sze (2008). Only conventional temporal adverbs

in HKSL seem not to be consistently marked by this NMM (only 35% of temporal adverbs are accompanied by raised eyebrows). Sze (2008) explains the small number of raised eyebrows marking temporal adverbs as scene-setting topics through the assumption that in HKSL not all temporal adverbs fulfil a framework function.

Moreover, although less frequently, scene-setting topics may be divided from the rest of the sentence by a pause or an eye blink (eb). Similarly, they may also show manual markers (MMs), such as the hold or the lengthening of the last sign.
An example of a marked scene-setting topic (sst) is reported below:

sst
(117) BACK, CL-two-person stand-behind-one-person
'At the back, two persons stand behind one person.'
(HKSL, adapted from Sze 2008:146, ex. 49)

However, in her study, Sze does not provide pictures, nor indeed are the NMMs displayed in the glosses, therefore it is impossible to detect the specific occurrence of such markers.
In both NGT and RSL, scene-setting topics are consistently, but not mandatorily, accompanied by raised eyebrows (re), and the use of such markers for identifying scene-setting topics is larger than the use of the same markers for aboutness topics. An example is displayed below:

re
(118) IX CAGE YELLOW BIRD CAGE
'In the cage, there is a yellow bird.'
(NGT, adapted from Kimmelman 2014:58, ex. 20b)

Since both aboutness and scene-setting topics are marked by the same NMMs, Kimmelman (2014) has hypothesized that these two types of topics may be part of the same macro-category of topics in NGT and RSL.
Furthermore, in both NGT and RSL, although less frequently, scene-setting topics may be prosodically separated from the comment, either by means of a pause or by being non-manually unmarked with respect to the remainder of the sentence.

2.3.3.2.3 Prosodic features of contrastive topics in sign languages

Wilbur & Patschke (1998) address contrastivity in ASL by reporting a systematic use of the prosodic markers of forward and backward body lean. Such strategies, according to their account, also perform an intonation function by enhancing the most prominent item of the sentence which can bear a contrast function with respect to other constituents.

Sze's (2008) data shows that the marker raised eyebrows and specific head positions in HKSL can optionally signal focus/topic contrast, especially in negative contexts. However, no further analysis of contrastiveness was carried out in her study. Kimmelman (2014) has carried out a limited investigation into contrastive elements, both in topics and focus elements, collecting data through QUIS, a specific questionnaire created for the elicitation of informational structure components.

From the preliminary results of his investigation, it seems that in RSL the prosodic markers for contrast are orthogonal with respect to topic and focus marking, since they spread over the entire contrasted clause, and are rightward (right bl) and leftward (left bl) body lean. By contrast, in NGT it seems that only the second clause is marked by a contrastive non-manual, which is again a body lean, while the first clause is unmarked. Examples of these tendencies are presented below, in (119) and (120):

left bl right bl

(119) CAT [BITE BOY]$_{FOC}$ IX DOG [BITE GIRL]$_{FOC}$

'The cat bites a boy, the dog bites a girl'.

(RSL, Kimmelman 2014: 125, ex. 27a)

right bl

(120) DOG [ON GIRL BITE]$_{FOC}$ CAT [BITE ON BOY]$_{FOC}$

'The dog bites a girl, the cat bites a boy'.

(NGT, Kimmelman 2014:125, ex. 27b)

As for LSC, Mayol & Barberà (2018) differentiate between double, implicit and weak contrast. They find that weak contrast elements are produced through the use of pronominal elements marked by specific NMMs, which are sucking in the cheeks, pulling down the corners of the mouth, and a shrug.

Navarrete-Gonzáles (in prep.), independently of new and old information, has identified several semantic types of contrast in LSC, each of which is accompanied by different NMM contours. In her study, contrastive topics are considered in the case of parallel contrast, i.e. when the contrasted alternatives are both salient and contextually present

alternatives. The contrastive markers in this case are the displacement of rightward (right bl) and leftward body positions (left bl) -together with the already discussed placement of the contrasted items in opposite loci in the signing space - and a head tilt. These NMMs can spread over the whole contrastive proposition, encompassing both topic and focus constituents, but they can also only spread over the focussed item, leaving the topic constituents unmarked. An example of marked contrastive topics is displayed in the sentence (121) below:

left sp right sp
left bl right bl

(121) GIORGIA$_{top}$ LINGUIST$_{foc}$ RAQUEL$_{top}$ INTERPRETER$_{foc}$
'Giorgia is a linguist and Raquel is an interpreter.
(LSC, adapted from Navarrete-Gonzáles in prep, ex. 31)

Geraci (2014:133) has upheld the account pertaining to other SLs of the use of ipsilateral and contralateral distinctions for marking contrastive functions, noticing that in LIS the distance between signs is sharper when a certain contrastive function is involved. However, further analysis is required in order to better understand the phenomenon.

To sum up, the NMMs involved in the recognition of topic types generally differ cross-linguistically, although some similarities can be observed, such as for example the more widespread use of raised eyebrows as a prototypical marker for topicality. Moreover, these NMMs never seem to occur mandatorily in reference to topic constituents.

2.3.4 Referential expressions and referential hierarchy in sign languages

Following spoken language theories, § 2.2.4 established a framework through which it is possible to single out properties and terminological discussions about referential expressions and hierarchy at a cross-linguistic level. This background is useful in the investigation of sign languages, in order to better consider how similar phenomena are characterized in languages which use a different modality. However, in so doing, it is important to be aware that linguistic forms and expressions analysed in languages which use an oral/auditory modality could be markedly different, if not also incompatible with manual/visual languages.
Sign languages use a wide range of language-specific strategies for encoding referential information, such as specific uses of classifiers and role shift. Since the earliest

investigations, many studies have been carried out cross-linguistically in order to analyse these forms (for ASL Neidle et al. 2000, Liddell 2003, Cormier et al. 2012, for LIS Bertone 2011, Mantovan 2015, for DGS Steinbach & Onea 2017, Wienholz, Nuhbalaoglu, Mani, Herrmann, Onea, Steinbach 2018). However, not many studies on the use of linguistic forms in relation to the referential system exist (see Frederiksen & Mayberry 2015; Czubek 2017, Ahn 2019 for for ASL; Barberà 2015 for LSC; Perniss & Özyürek 2014 for DGS).

An outline of the characteristics of the main common referring expressions is presented in § 2.3.4.1, and § 2.3.4.2 is intended as an overview of those pieces of research providing a preliminary referential hierarchy that holds true in SLs.

2.3.4.1 Referential expressions in sign languages

Sign language studies may reveal the existence of different anaphoric strategies for retrieving previously mentioned items. In the past, several scholars have tried to analyse referential expressions, focusing on one aspect or another of these forms (see Neidle et al. 2000, Liddell 2003, Cormier et al. 2012, Frederiksen & Mayberry 2016, Czubek 2017, Ahn 2019 for ASL; Barberà 2015 for LSC, Perniss & Özyöurek 2014, Steinbach & Onea 2017, Wienholz, Nuhbalaoglu, Mani, Herrmann, Onea, Steinbach 2018 for DGS; Bertone 2011, Mantovan 2015 for LIS, among others). The following sub-sections highlight the main strategies and seekto briefly account for the properties and the characteristics of such syntactic categories. Nominal expressions are addressed in § 2.3.4.1.1, pronominal forms in SLs and analysis of the appropriate contexts for their resolution are presented in § 2.3.4.1.2. Null arguments in SLs and their licensing conditions are addressed in § 2.3.4.1.3. Finally, the cross-linguistic interaction between definiteness and anaphoric tools is investigated in § 2.3.4.1.4.

2.3.4.1.1 Nominal Phrases (NP) and Determiner Phrases (DP) in sign languages

Following studies in spoken languages (Abney 1987, Radford 1993, Giorgi & Longobardi 1991, Cinque 1994), cross-linguistic research in SLs (see Neidle et al. 2000 for ASL, Mantovan 2015 for LIS) has adopted the assumption that a DP is headed by a determiner, which may take an NP as a complement. Therefore, similarly to a clause, NPs are analysed as being composed of an NP shell, containing a certain number of functional projections, which are combined with several syntactic features, such as number, person, and definiteness. In line with the DP hypothesis (Abney 1987), similar

structures are generally called DP, since the NP is assumed to be headed by a determiner, even when the determiner is realized as an empty category. However, the definition of NP continues to be used to refer to the specific NP projection within the broader structure.

Neidle et al. (2000) argues that in ASL both definite and indefinite determiners may occur in the initial D position, also functioning as pronouns. Indeed, this view supports the hypothesis that pronominal elements are determiners. Moreover, they claim that agreement in DPs is expressed through both manual and non-manual strategies, such as head tilt and eye gaze, and it is interesting to note that the same distribution pattern of non-manual expressions in the clause also holds true for the DP. Indeed, according to their analysis, possessive DPs behave as transitive clauses, and non-possessive DPs behave as intransitive clauses.

They also argue that while definite and indefinite determiners occupy a prenominal position in ASL, by contrast the DP-internal post-nominal indexes are locative adverbs. However, this interpretation is not aligned with other studies, which consider both the prenominal and postnominal index as instances of determiners (Wilbur 1979). An example of the approach supported by Neidle et al. (2000) is reported below:

(122) JOHN KNOW IX_{det} MAN IX_{loc}
'John knows the man over there'.

(ASL, Neidle et al. 2000: 89, ex. 3)

The determiner index in the initial D position is distinguishable from indexes which fulfil other syntactic functions in terms of semantic properties. In the case that a DP contains such an index, it is considered definite.

However, according to Koulidobrova & Lillo-Martin (2016), ASL is a bare nominal language which can bear anaphoric functions, without mandatorily requiring the additional indication of definite or indefinite markers. In fact, the definiteness and indefiniteness of a constituent could be retrieved by the linguistic or extra-linguistic contexts.

In a similar way in LIS, the eventual lack of a manual index, which fulfils a determiner function, is supplied by non-manual strategies which allow for distinction between an identifiable and an unidentifiable constituent. According to Bertone (2009:122), in LIS the markers fulfilling this function are raised eyebrows, a slight head tilt backward, pursed cheeks, and a slight opening of the mouth. These markers may indicate that a constituent is defined, by contrast with the mouth corners down, and a vague glance into

an undetermined point in space may indicate undefined and unidentifiable constituents. All of these features may accompany the manual sign and spread over the whole nominal phrase, or they can be restricted to the manual indication or the nominal phrase in the case of the absence of manual indexation. Concerning the order of the determiner in relation to the nominal expression, Bertone (2007, 2009) detected the occurrence of nominal modifiers in the post-nominal position in LIS. The specific unmarked order of nominal features is postulated to be as follows:

(123) N> Adj> Num> Dem

(LIS, Mantovan 2015:90, ex. 42)

The adjective expression follows the noun and precedes numeral indications, while determiners are placed in the final postnominal position. Branchini (2007) and Brunelli (2011), developing this analysis, added possessives, which are quickly placed between the noun and the adjective expression, and quantifiers, which occur after the determiner.

Working within the generative framework, Mantovan (2015) analysed spontaneous LIS data, and specifically the nominal structures, by adopting the DP hypothesis. Moreover, following Cinque (20105, 2012), she assumes the same cartographic composition of the DP hypothesized for spoken languages. Mantovan improved the analysis of DPs by enlarging the features outlined in previous studies (Bertone 2007, 2009). She also considered NMMs and included social variables, such as the mean age of the signers, the family composition, or the type of education received. By considering these factors, she noticed that in LIS younger signers preferred a postnominal occurrence of the determiner in the internal DP structure, as displayed in the example below:

(124) PERSON HEARING IX
'The/This hearing person'.

(LIS, Mantovan 2015:174, ex. 14a)

However, cross-linguistic analysis such as this considers DPs in isolation without further investigating the function of these linguistic forms within a referential system. Only recently, a small number of studies (Frederiksen & Mayberry 2016, Czubek 2017, Ahn 2019 for ASL; Perniss & Özyürek 2014, for DGS) have been conducted in ASL and DGS considering these forms as referential expressions within a more complex discourse system.
A study conducted in DGS (Perniss & Özyürek 2014) has proven that fuller forms, as nominal expressions, are used more often in cases of reintroduced contexts.

Based on this study on DGS, Frederiksen & Mayberry (2016) have established an experiment to test a wider range of referential expressions in ASL, by analysing short narrative stories (The balloon story) which were presented to the signers through black and white drawings and video tapes. The stories were causally related, with each presenting a main character, a secondary character and a featured object. Proportionally, the presence of nominal expressions in their study shows a small level of occurrence, however, it seems that signers distinguished different nominal categories with respect to the introduced, reintroduced or maintained status of referents. For example, the data showed that newly-introduced entities are encoded using the greatest variety of nominal expressions, while reintroduced referents are only encoded by bare nouns. In their studies, nominal expressions also occurred as maintained referents and, in those cases, they are equally produced as finger-spelled nouns, bare nouns, and nouns with both prenominal and postnominal indexation.

Generally, in line with the previous expectations, DPs function as informative fuller retrievers for referential information, generally signalling newly-introduced items or given reintroduced expressions with low accessibility. However, certain improvements were introduced in the most recent piece of research (Czubek 2017, Ahn 2019) by considering new variables and improving the complexity of the data analysed.

In the analysis carried out by Czubek (2017) for ASL, definite descriptions and demonstratives are investigated as highly informative referential expressions, without distinguishing between bare nouns and determiner phrases. In line with previous studies (Frederiksen & Mayberry 2016), Czubek's analysis also shows that definite descriptions are encoded into the discourse as new or reintroduced entities. However, unlike Frederiksen & Mayberry (2016), Czubek improved the level of complexity within the collected stories, introducing more competing animate entities and a more complex story-line. In so doing, he pointed out a reduction of the overall entity accessibility value and was able to investigate a wider range of referring expressions. He also noticed a steady rise in the number of explicit referring expressions (including DPs), parallel to the increase of the number of competing entities. Indeed, in cases of more complex discourse context, with more participants and objects, the speaker seemed more likely to encode a reintroduced entity signalling its lower accessibility by means of nominal expressions. By contrast, the simplicity of the structure and the paucity of participants involved as referents in the balloon stories may weaken the variety of syntactic categories involved in the discourse.
By referring to the Accessibility Scale (Toole, 1996), Czubek (2017) also applied and calculated numerical accessibility values for each of the entities encoded by referential expressions, an innovation that was unique to his analysis.

An additional introduction in Czubek (2017) consists of a comparative analysis between the linear and concurred conditions of the considered referring expressions. It means that referential forms are taken as structures in isolation, or co-occurring within the so-called constellation. A constellation occurs when multiple entities are signed into the discourse simultaneously, benefitting from the economical privilege of the manual/visual modality which allows simultaneous representation of the entities which relate to one another. By analysing the different context of occurrence, Czubek (2017) noted a diminished proportion of definite descriptions in constellation. His results may call for a maximally explicit form and the highly informative status of these expressions would not be appropriate to appear in a constellation. Indeed, constellations increase the occurrence of referring expressions with a lower accessibility when these expressions occur in isolation. Therefore, Czubek proposed that "referential expressions leverage their dense, economical architecture in order to promote explicitness by benefitting from a pattern of redundancy made possible by concurrent architecture of constellation" (Czubek 2017:146). This may explain why DPs do not occur in constellation, since they already convey highly explicit information.

Finally, Czubek (2017) analysed nominal expressions in contexts where the interlocutor was unfamiliar with the topic of the discourse, in order to better understand how the accessibility deficit is managed among signers. The study pointed out an increase in the number of propositions in cases of maximally-explicit narratives. Surprisingly, contrary to what was expected, the number of referential expressions did not change with respect to familiar or maximally-explicit narratives, confirming a strong reliability across the data.

In the same spirit, while investigating the same corpus of Frederiksen & Mayberry (2016), Ahn (2019) introduced new factors, such as the presence of competitors within the distance between a previously mentioned referent and its reintroduction, the influence of animacy in retrieving a constituent, and a further categorization of the data considering broad and narrow anaphora. In this regard, she defined the previous categories which contained both maintained and reintroduced discourses as instances of broad anaphora, and only maintained referents as narrow anaphora. In her investigation of the distribution of ASL anaphoric expressions, she pointed out the preferred co-occurrence of nominal expressions with broad anaphora. Indeed, in ASL nominals seem to be mostly used in those situations when other linguistic competitors are introduced, decreasing the accessibility level of the anaphoric referent and increasing the ambiguity of retrieving the correct one.

However, not all studies at a cross-linguistic level confirm such distinctions: in LSC (Mayol & Barberà 2018), for example, NPs and DPs (respectively defined in their study as BN and NP) are used in cases of topic change, but surprisingly they are also used with a topic continuation function. However, the small amount of data and low number of participants requires further studies in LSC.

In LIS some studies have investigated the referentiality values applying to the signing space (Bertone 2011, Geraci 2014), however no previous studies account for the occurrence of these forms in terms of referential systems. The current study aims to investigate such interrelated systems by considering this new analytical perspective .

2.3.4.1.2 Pronouns in sign languages

Pronominal reference is achieved in sign languages by means of indexical pointing signs in specific loci of the signing space and is able to establish the location of specific referents, or to indicate a referent previously placed in the same spatial locus. Indexical pronominal signs are commonly annotated IX in the literature of SLs. Indexical pointing signs refer to a particular entity which is either physically or conceptually located in space by means of the signs' directionality. This pointing has been analysed in the existing literature in several ways. Some scholars (Neidle et al. 2000, Liddell 2003) have conceived of such an element directed through a locus in the signing space as a definite determiner, while others (Irani 2016[21]) have pointed out the correspondence between indexation and anaphoric functions. Other researchers (Engberg Pedersen 1993 for DSL, Barberà 2015 for LSC) have claimed that spatial location encodes referential prominence rather than definiteness, while others such as Koulidobrova & Lillo-Martin (2016) have disagreed with these analyses, claiming that pointing to a spatial location does not necessarily trigger a definite and familiar interpretation of the referred entity.

The distinction between the grammatical features of these elements is complicated by the fact that they often display homophonous realizations, and in such cases the context is crucial for interpreting their functions as adverbs, pronouns or determiners. Liddell (2003), considering ASL, agreed with other scholars (Zimmer & Patschke 1990) that the distinction between pointing that functions as a determiner element used in combination with nouns, and pointing that functions as a pronominal form, is far from straightforward. He also appealed for the existence of a break in distinguishing pointing which serves a determiner function, such as IX BROTHER "the brother", from indexations

[21] Irani (2009) claimed that IX should be analysed as a familiarity-denoting marker, with anaphoric properties, against the hypothesis of a uniqueness-denoting marker which only displays unicity. Indeed, according to this theory, the indices require the addressee to be familiar with the expression produced by the speaker/signer.

with pronominal functions followed by an appositive, as in the example HE, BROTHER, interpreted as "He, my brother" (Liddell 2003: 331).

As for LIS, the three-class distinction theorized for spoken language holds true (Bertone & Cardinaletti 2011). All the pronouns in LIS are realized through pointing, but specific features allow for distinction between them. Strong pronouns in LIS seem to share the same syntactic distribution of NPs, they can be not-anaphoric, which means they can introduce a new referent into the discourse. Moreover, strong pronouns can often be followed by a pause and allow reduplication, unlike weak and clitic pronouns. Strong anaphoric pronouns also display a long temporal production and can be mantained by the non-dominant hand simultaneously to other signs articulated with the dominant hand. Finally, strong pronouns are often definite, although some of them can also be indefinite and non-specific. Conversely, weak pronouns always carry an anaphoric value; they are not adjacent to the predicate and do not show any pause after their realization. Moreover, weak pronouns cannot be reduplicated, and their temporal duration is shorter than that of strong pronouns, but longer than that of clitic pronouns. Clitic pronouns, finally, are always anaphoric: they are close to the predicate and can be co-articulated with it. Like weak pronouns, clitics do not present any pause and cannot be reduplicated. Finally, the temporal duration is so short as to be almost unnoticeable. Given the necessity of further research for the referential attitude of these latter two classes of pronouns, at this stage of the analysis strong pronouns will be analysed, while weaker and clitic forms will be left aside for future investigations.

Despite the paucity of research into pronominal uses within a comprehensive system of referring expressions, the anaphoric value of indexation in SLs has been addressed by a great number of studies on SLs (among others, Neidle et al. 2000, Liddell 2003, Cormier et al. 2012 for ASL; Barberà 2015 for LSC; Bertone 2011, Zucchi 2012, Mantovan 2015 for LIS; Sze 2011 for HKSL, Kimmelman 2014 for NGT and RSL, Steinbach & Onea 2015 for DGS). It was widely agreed among scholars (Liddell 2003, Meier 1990 for ASL) that since signs can be directed towards a potentially infinite number of places in the signing space, a potentially uncountable number of distinct pronominal forms exists in SLs. Indeed, these hypotheses are strictly related to the unambiguity argumentation, namely, the postulation that since each location is associated with a single referent, the pronominal form uniquely identifies that referent.

However, Barberà (2015), for LSC, corrected this statement by assuming the infinite existence of discourse referents, but not pronominal forms. According to her analysis, unambiguity and infinity assumptions are contradictory, since the postulation of the unambiguous retrievability of constituents that are infinitely placed in the signing space, and of the one-to-one relationship, are impossible to assume. Barberà (2015) has

forcefully argued against the common overlapping between pronouns and discourse referents. Indeed, pronominal forms are not established in discourse, but serve to establish discourse referents. Therefore, pronouns must be intended as the linguistic strategy used to denote referents, while discourse referents are entities and objects about which the discourse predicates something. In line with this account, pronominal expressions are discrete and limited units, while discourse referents are potentially indefinite. Moreover, it is key that English and LSC pronouns are proforms, therefore they both need the linguistic and extra-linguistic contexts to retrieve their meaning. In fact, without a discourse model these forms remain ambiguous.

Given this semantic flexibility, pronominal forms are generally considered in spoken languages as being leaner, more economical tools for retrieving referents against the redundant use of nominal expressions, which are informationally heavy. However, this light informational status is due to their being *shifters* (Bhat 2004), namely elements that are dissociated from their referents. This condition forces pronouns to be unidentifiable elements in the absence of a referring discourse model within which their semantic resolution could be located. Similarly, previous research into SLs has demonstrated that pronouns are involved with highly accessible contexts. For example, the study conducted in DGS by Perniss & Özyürek (2014) has proven that these forms are more commonly used in maintained contexts.

Contrary to such expectations, in ASL, Frederiksen & Mayberry (2016) have detected a negligible occurrence of pronouns in maintained contexts, namely in contexts with highly accessibility. Moreover, their data has shown an infrequent use of these pronominal elements. On the other hand, null arguments and other anaphoric strategies combined with null argument, such as constructed actions, are more frequent strategies used in spontaneous narrations. They blame the lack of pronominal expressions on the small proportion of reintroduced referents in their data and to the simple story-line of the stimuli. Indeed, the actions in their stories are most often performed by the main character.

Czubek (2017) revised the collecting materials used by Frederiksen & Mayberry (2016) and repeated the experiment, increasing the number of characters and the complexity of the plot. In the process, indexical pronouns arose as an independent referential form used in isolation and were mostly employed in reintroduced and maintained contexts in both the narrative stories (improved and replicated from the Frederiksen & Mayberry test) and in ASL literature narratives, however, their quantity was larger in the latter type of data.

Ahn (2019) has proposed a new insight into the interpretation of indexation pronouns found in the data of the two previous studies in ASL (Frederiksen & Mayberry 2016, Czubek 2017). Specifically, she distinguishes between the semantic and syntactic properties of the indices (IX) involving the use of loci in the signing space (IX_{LOC}), and those without this use which are realized in neutral positions (IX_{NEUT}). This differentiation was not made in the earlier studies. She states that loci in ASL are mostly triggered when they fulfil contrastive functions, with other referents interpreted as competitors. She tests this hypothesis by collecting elicited sentences and grammaticality judgments from ASL signers. The results show that indexation in neutral space is only licensed when there is a uniquely retrievable referent in the narrow context, while pointing through loci is allowed in cases of competing referents. In this spirit, she explains that the paucity of indexation occurrences in the two previous studies wasdue to the small number of competitors. In so doing, she challenges the hypothesis that sign language loci are interpreted as an over instantiation of indices. For the purpose of the current study, however, indexes are considered regardless of their overt or covert reference to a specific signing locus and the theoretical debate is left aside for further research on LIS. Moreover, in her investigation, neutral indexation seems to specify animacy by means of a forward pointing direction. In contrast, a downward pointing direction indicates inanimate entities. Unfortunately, the elicited data set involved in the study was very restricted, and this may have represented a limitation or may have affected the analysis.

In LIS, except for some introductory studies (Zucchi et al. 2012, Geraci 2014) on the anaphoric uses of indexations, no research to investigate the pronominal function in relation to a referential system has been carried out so far. The current study offers a preliminary account, in an attempt to better comprehend these elements in terms of their referential value within spontaneous discourses.

2.3.4.1.3 Null arguments and reference conveyed by predicates in sign languages

Since the first studies in ASL, the omission of the subject has been noted. For example, Friedman (1976) pointed out the high possibility of finding textual data of SVVVV constructions in ASL, which should be interpreted as sequences of subject + verb followed by several deleted subjects + verb patterns. In these cases, the deleted subject is assumed to correspond to the last subject mentioned, except for first-person verbs, which generally omit the realization of the first-person pronoun. Since then, many other studies have been carried out at a cross-linguistic level, pointing out that omission of the subject/object across sign languages is not only possible, but also quite frequent,

although not all types of omission are equal (Frederiksen & Mayberry 2016, Czubek 2017, Santoro et al. 2017).

Indeed, modality-specific and language-specific strategies exist in sign languages for conveying further information about the resolution of the pro-drop. By encoding pieces of information, all of these different strategies offer syntactic and semantic cues to the addressee for recovering null arguments, and the existence of such linguistic tools can probably explain the more widespread and flexible use of null arguments. Verbal agreement is considered by many scholars (Perniss & Özyürek 2014, Frederiksen & Mayberry 2016, Czubek 2017, Ahn 2019) as a useful tool for retrieving omitted arguments; however, plain verbs, which are generally assumed not to carry out agreement features, may also license the presence of null arguments. Signers may also choose to map an external referent on their body, determining a transfer from the referred entity to the first-person, and such strategies are known as role-shifting. Another widespread referential tool is the use of predicative classifiers, which are verbal constructions joined with handshapes which are related either to a referent or the way in which a referent is handled. For the purpose of the current research, only agreement, plain verbs and predicative classifiers are considered in more detail and addressed in the following section.

Verbs in sign languages have also often been analysed in terms of their agreement properties and divided into agreement and spatial verbs, which respectively agree with subjects/objects and locations, and plain verbs which do not show any inflectional markers (Padden 1990, Meir 2002). Agreement verbs carry out a transfer which can be either concrete or abstract and may be subdivided into two types: regular verbs and backward verbs. The former displays a linear subject-object agreeing pattern, while the latter shows the inverse object-subject agreeing direction. Spatial verbs are verbs that agree with spatial referents, such as location or places located in the signing space, and also show an initial point associated with the source of the motion, and a final point indicating its goal. According to recent studies in SLs (Oomen 2018), in the current research the two categories are combined into macro-categories which are uniformly labelled as agreeing verbs.

Furthermore, agreement is also a linguistic device for tracing back previously mentioned referents over a stretch of discourse. As seen in the previous section, in sign languages, referents are assigned a specific place in the signing space through a pointing sign in a specific referential locus (R-locus), or through non-manual strategies, such as eye gaze direction. However, the manual/visual modality also allows the identification of already introduced referents through locations assigned in the signing space. In this

light, R-loci fulfil anaphoric and pronominal functions, containing information for the unique identification of already active referents. Agreement in SLs is realized when the initial and final parts of a verb are directed through the space and "determined by the R-loci expressions of its argument" (Meir 2002: 420). This is also the reason why arguments of agreement verbs may be omitted and substituted by their R-loci.

An example of an agreeing verb is shown below:

(125) $_1$HELP$_2$
"I help you"

According to Meir (2002), agreement in Israeli Sign Language (ISL) verbs seems to be "thematically rather than syntactically determined" (Meir 2002: 414). However, this account would be problematic as a universal grammar theory capable of explaining phenomena in both oral-acoustic and visual-gestural modalities. Oomen (2018) has pointed out that agreeing verbs mostly express some form of interaction between participants, rather than indicating transitivity, as suggested in other studies (Meir 2002).

Sometimes, verb categories may also overlap with each other, showing cases of hybrid forms, such as the verb SEE, which in DGS may be considered both as an agreeing and a plain verb (Oomen 2018). Even though agreement verbs do not always display overt agreement features, some recent research has claimed that verbs always display agreement features, even when they are categorized as plain verbs (Neidle et al. 2000). Despite this claim, however, other scholars (Padden 1988, Lillo-Martin 1986) have argued that plain verbs cannot agree with their subjects or object and that in the case of plain verbs, the licensing of pro-drop subjects is permitted not through inflectional verbal features, but through topicality. It is not the aim of the current study to investigate such assumptions, and the debate on this matter is thus left open for future research. Agreement verbs are, however, considered separately from plain verbs in this investigation in order to detect whether any difference exists in their referential properties.

As for the second referential strategy considered, namely predicative classifiers, according to previous studies, classifiers in sign languages are considered as discrete morphological units which appear to be related to certain argumental features. In particular, predicative classifiers are morphemes that categorize nominal entities, are represented by handshape, and appear as joint in a verbal root, conveyed by movement (Benedicto & Brentari 2004, Mazzoni 2008). An example of a predicative classifier is displayed below. It is important to keep in mind that these linguistic elements are

simultaneously realized, therefore they need to be conceived as unitary linguistic forms, although the following glosses are forced to describe them sequentially:

(126) BICYCLE 3+MOVE_UP
"The bicycle went up (the mountain)"

(ASL, adapted from Benedicto & Brentari 2004:748)

Despite the widespread degree of confusion concerning a detailed classification of these entities, some theories have supported the syntactic subdivision of predicative classifiers into two groups. The first group concerns those predicative classifiers that are related to internal agreements, therefore indicating objects of transitive verbs and subjects of unaccusatives. The second group relates to syntactic external arguments, which are subjects of both transitive and unergative verbs.

Morphologically, these types of predicates have been macro-analysed in movement morphemes and handshape morphemes. The first aspect describes the types of movement that these verbs encode in terms of manner/imitation, contact/position, and the extention/stative description of this movement; the latter attempts to classify the handshape used in the predicative classifiers, depending on their way of entirely or partially describing the entity, its extension/surface, and the way in which this entity is handled (see Engberg-Pedersen 1993 for Danish Sign Language; Benedicto & Brentari 2004 for ASL). For the purpose of the following study, we will not enter into the debate about the morpho-syntactic properties of predicative classifiers, but will instead focus exclusively on the referential properties of these verb types.

Since a classifier generally refers to a restricted set of entities, the use of verb classifiers allows the addressee a better resolution of the omitted referents. From a grammatical point of view, predicative classifiers have been attributed to already mentioned referential strategies, such as agreement markers (Benedicto & Brentari 2004), pronominal expressions, or lexical permanent features with gradient aspects (Liddell 2003), amongst others. In the present study, these structures are separated from the remaining referential expressions, since they relate the form and meaning of referents differently from other strategies.

Since the categorical classification of these constructions is complex and widely debated (see Benedicto & Brentari 2004 for ASL, Mazzoni 2008 for LIS), for the purpose of the current study only two types of classifiers are considered, setting aside the debate about SaSS (Size and Shape Specifiers), which mostly fulfil nominal and adjectival functions. The types of classifiers considered are semantic and handling

classifiers. The first denotes some formal or semantic properties of the referent in discussion, while the latter represents the ways in which tools or objects are handled. For our investigation, these two categories of classifiers are investigated as joint in macro-categories, and, in fact, both of them serve predicative functions by using similar strategies of referentiality.

Other language-specific strategies correlated with the encoding of referential information include constructed actions, or those cases where the signer assumes specific facial expressions and body postures, imitating the referent about which he is talking. These strategies fulfil several functions, for example, serving linguistic structures for reporting direct speech. However, in the current study, these types of construction will not be considered.

As for LIS, a preliminary investigation on subject omission (Santoro et al. 2017) was conducted based on spontaneous data coming from different parts of the country. Results show that a huge percentage of subjects is omitted in LIS. Indeed, 53% of the total subjects of the data are not overtly realized and the main effect seems to be attributable to the type of verb and to social factors, such as geographical provenance and age. In particular, 62% of the total null subjects are licensed by agreeing verbs, while 44% occur with non-agreeing predicates. The example below displays such a usage with the agreeing verb TEACH:

(127) _____ TEACH PROGRAM HEARING EXACTLY
'They taught me exactly the hearing program'.

(LIS, Santoro et al. 2017: slide 32)

Agreeing verbs are more likely to occur with null subjects, and in fact the overt realization of loci enhances the recovery of referential information (Gerarci & Aristodemo 2016). In their study, the presence of a previous discourse reference, the clause type and the clause-mate co-reference also influence subject omission, although less so than the verb type. Moreover, in line with their results, pro-drop and topic-drop seem to operate in complementary distributions in relation to the clause types in LIS. Unfortunately, the study only focuses on subject omission, without considering cases of object omission and without accounting for a more comprehensive model of referential expressions. Further research is therefore required in order to better understand such interrelated phenomena in LIS.

2.3.4.1.4 Definiteness and other referential strategies in sign languages

The question of how the definiteness category correlates with topicality is a contested issue in sign language literature, although studies on definiteness in SLs are scarce. Earlier research (Friedman 1976) admitted that ASL may have indefinite topics in subject position, but not in object position. However, other studies (Liddell 1980) have discussed this hypothesis, claiming that ASL seems to exclude the possibility of indefinite topics.

McIntire (1980) overlaps the old/new principle, which states that communication proceeds by preponing the topic to the comment with a definiteness criterion, and stating that the sentence distribution is ordered from the least definite to the most definite element. According to her assumption, a given entity must be defined, but defined entities must also bear new information. Indeed, in the sentence like (128) below, the element that is least in focus in the discussion is BOOK, while the most definite item is PAPER.

(128) TABLE clfr BOOK UNDER clfr:PAPER ON
"The piece of paper is on the book under the table".
(ASL, McIntire 1980:40, ex. 15)

According to more recent investigation (MacLaughlin et al. 2000, Wilbur 2008), definiteness in ASL is formally marked by the presence of an indexical point which precedes the noun and is directed through a specific place in the signing space. Indefinite DPs, on the other hand, are produced by manual and non-manual markers, establishing the nominal expression in the upper part of the frontal space and using the determiner SOMETHING/ONE. The main difference between the indefinite determiner and the numeral is that the indefinite form also carries a circular movement of the forearm and the hand. Moreover, the eye gaze is fleeting and is directed through the upper part of the space.

Similarly, Tang & Sze (2002) have pointed out that in HKSL an indefinite determiner is realized throughout an upward indexation, but is not combined with any tremor movement. In these cases, THE eye gaze is not directed toward the space, and no spatial locations are established for the referent. Conversely, in LSC (Barberà 2015) darting eye gaze and undefined spatial location mark unspecificity rather than the indefiniteness of discourse referents. Moreover, while both ASL and HKSL indicate definiteness by pointing through the lower area of the signing space, in LSC both definite and indefinite markers may be placed in the lower frontal plane.

Studies in LIS (Bertone 2011, Mantovan 2015) have confirmed such tendencies, namely, the presence of a manual indexation directed through a specific point in the signing space to convey definiteness. Moreover, facial expressions such as raised eyebrows, head tilt back, sucked cheeks and a slight mouth opening contribute towards marking a definite constituent. Bertone (2011) has noted that the same non-manuals also accompany topicalized constituents. By contrast, indefiniteness is conveyed through the manual sign ONE being directed in an unspecified point in the upper part of the signing space. Circular and tremor movements accompany the hand and the forearm, in exactly the same as indefiniteness is expressed in ASL and HKSL.

Other scholars, such as Engberg-Pedersen (1993), considering DSL, have opposed the hypothesis about overt definite markers in SLs. By referring to the example (129) below, she claimed that "it is the combination of concreteness and high general relevance (both the signer and the receiver know the chairman) that makes the signer use determiners in nominals" (Engberg-Pedersen 1993:100):

(129) DET COUNTRY^CHAIRMAN AGAIN^ELECT /
'The chairman was re-elected.'

(DSL, Engberg-Pedersen 1993:100, ex. 5)

The correlation between definiteness and referentiality is enhanced in this account. According to Engberg-Pedersen (1993), high referentiality does not only depend on the frequency of the previous mention, but may be a consequence of the high relevance of the referent in the discourse with respect to the participants. Moreover, she argued that concrete, specific referents with high thematic values, which are meant to be kept separate in order to better understand their interactions, are more likely to be represented by a specific locus in space.

Despite recognition of the strong interaction between topicality, definiteness, and locations, Barberà (2015) carried out a formal analysis of discourse referents, by considering definiteness, specificity and topicality in a more precise theoretical framework. According to her hypothesis, the selection of a discourse referent only depends on the linguistic context, where syntactic-semantic-pragmatic aspects are all included, and is not consequential to the establishment of a specific locus in the signing space. She further distinguishes between strong and weak familiarity, where the former is detected when a linguistic antecedent exists in the previous piece of discourse, while the latter refers to the existence of an entity that is entailed in the context.

With this in mind, she demonstrates that, in LSC, the mere placement of a referent does not trigger a definite reading, and definiteness is implemented by the status of the discourse referent in the context. Indeed, when pointing is established in the case of a presupposed referent, it is better understood with respect to its familiar status, than its definite status. Since no detailed studies exist in LIS, in the present research only strong examples of familiarity are considered, namely, only constituents already mentioned are investigated as instances of aboutness topics and in the spirit of previous observations considered as defined.

2.3.4.2 Referential Hierarchy in sign languages

As discussed in the previous sections, studies on referentiality in SLs which apply to the hierarchical order of linguistic expressions are scarce and have mostly been carried out for ASL.

Similarly to spoken languages, general statements about referential expressions also hold true in SLs (see Perniss & Özyürek 2014 for DGS; Frederiksen & Mayberry 2016, Czubek 2017, Ahn 2019 for ASL). Indeed, at a cross-linguistic level, leaner strategies, such as subject omission, are likely to be used in the case of highly accessible referents, while informationally fuller categories, such as DPs and NPs, are mostly involved when the status of the referent under discussion is considered by the signer to be lessaccessible. However, exceptions to this general tendency exist, such as those pointed out by Barberà (2015), and may depend on several factors, such as (but not limited to) the context in which the data were elicited, the perceived significance of clarity for the signer, the signer's assessments regarding ambiguity in retrieving referents, the presence of competitors and the distance elapsing between the last mention of a referent and its anaphoric resumption.

Studies that have aimed to investigate referentiality in sign languages have become more and more detailed in their evaluation of more spontaneous and complex discourse contexts and in accounting for more factors related to the informational status of constituents. In their experiment on reference tracking in DGS, Perniss & Özyürek (2014) coded nominal expressions, pronouns and zero anaphora, although the scope of their investigations went beyond identifying referential expressions. Indeed, their main focus was to explore the differences between sign languages, co-speech gestures and gestures in spoken languages by considering how visual modality affects communicative exchanges. Although they identified some subcategories for each of the referential macro-categories, the range of referential forms does not account for those language-specific constructions, such as predicative classifiers or role-shift structures.

They divided nominal phrases into indefinite, definite, and modified NPs and pronouns into demonstratives, personal, relatives and indefinite.

They also related these expressions to the specific referential context from which they originally came, determining whether the informational status of a referent was introduced, reintroduced or mantained, depending on the novelty of its introduction into a discourse, its reintroduction after a previous mention, or its mantainance as a prominent referent across sentences.

Their results showed that referents in subject positions in reintroduced contexts were more likely to be overtly realized than referents in mantained contexts, which were mostly omitted. Moreover, they noticed a greater involvement of nominal expressions in cases of reintroduced context (66%) and, by contrast, a major number of pronominal occurrences in cases of mantained context(60%), as displayed in the table from their study reproduced below:

Table 2. Distribution of overt referring expression types by referential contexts. For DGS nominal versus pronominal forms.

Re-Introduction	DGS (N = 74)
Nominal (%)	66
Pronominal (%)	34
Maintenance	**DGS (N = 22)**
Nominal (%)	40
Pronominal (%)	60

(DGS, adapted from Perniss & Özyürek 2014: 14, table 1)

They didn't however investigate other language-specific strategies and their analysis mostly lacked a cross-linguistic comparison.

Based on Perniss & Özyürek's experiment, Frederiksen & Mayberry (2016) carried out a study on the referential hierarchy in ASL, enlarging the variety of anaphoric expressions, and including predicative classifiers and constructed actions in their account. However, they only focused their research on subject positions, therefore they did not analyse topic objects, and excluded those cases in which these elements are the predominant referent in a sentence. Moreover, they only counted sequential references, and did not consider cases in which multiple strategies occur together, as for example in null or overt referring expressions co-realized together with constructed actions. Constructed actions were only considered when taken in isolation. Similarly to the

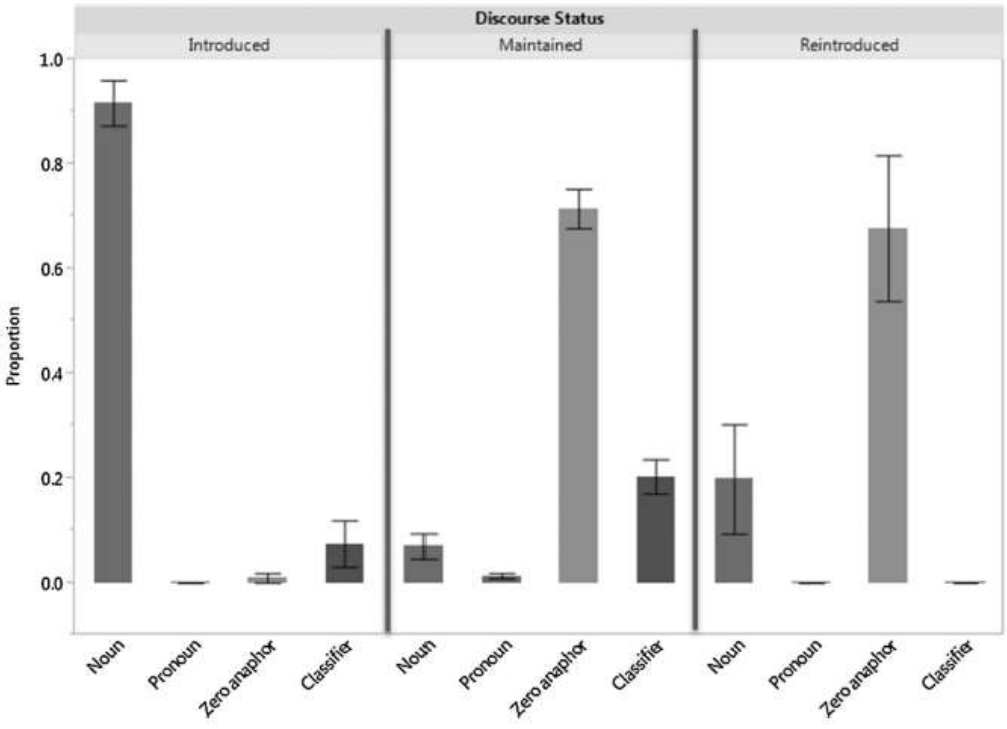
previous study in DGS, they subdivided the referential status of the considered items into three types: introduced, reintroduced and maintained.

The results display a great asymmetry in the findings correlated to the maintained status (69%) versus the small number of referents in reintroduced contexts (7%). As stated in previous sections, this may be attributable to the very short frame of discourse and the simplicity of the narrative story-line, which revolved around few characters. Indeed, they detected that average retellings had a duration of 15.03 seconds, within which signers produced a mean of 12 sentences. The fact that the discourse environments were so short could have contributed to the limited production of reintroduced referents, since referential complexity is also given by the number of proportions that occur between the first mention of a referent and its reintroduction.

In line with the predominant maintained contexts, the most frequent linguistic strategy involved in mentioning referents was the omission of the subject. However, contrary to expectations, this strategy was used in both reintroduced and maintained contexts.
Moreover, in contrast with their assumptions, the pronominal occurrences were scarce and their role in maintained contexts was negligible. Therefore, no pronominal function was detected in terms of informational function.

Finally, classifiers were mostly realized in maintained contexts, disconfirming their presupposed role as informational fuller forms. It is interesting to note that the omission of subjects with plain verbs seems to mark a higher level of accessibility than the omission of subjects occurring with agreeing verbs. This is also detected in the LIS data and further addressed in § 6. A resumptive analysis of the findings and the referential hierarchy which was displayed in Frederiksen & Mayberry's study are presented below in Chart (1) and Figure (34).

Chart 1. Mean proportion of referent category by status.



(ASL, Frederiksen & Mayberry 2016:30, figure 7)

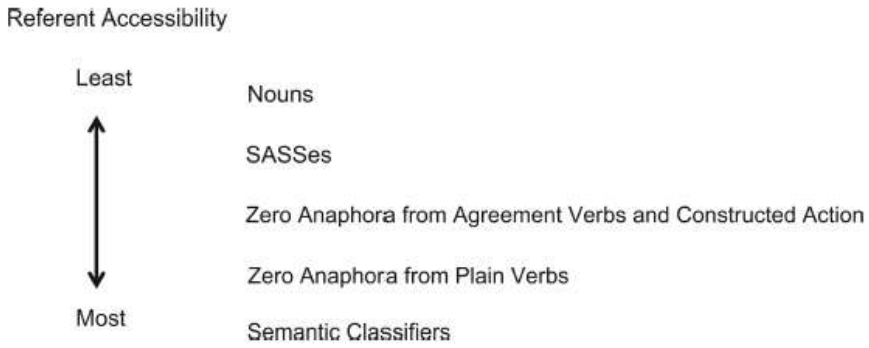


Figure 34. Preferred ASL referential expressions as a function of referent accessibility.
(ASL, Frederiksen & Mayberry 2016: 32, figure 9)

Czubek (2017) extended the previous study by Frederiksen & Mayberry (2016) to create a more complex stimulus where three animate competing entities were established alongside two inanimate entities. He also analysed ASL narratives, comparing the findings in the two types of data. In so doing, he aimed to better explore the possible reasons for variation between different datasets.

Frederiksen & Mayberry's study triggered distinctly unexpected results. Moreover, for the first time they considered referential expressions occurring in isolation, and referential expressions occurring in constellation, i.e. multiple referents being signed

simultaneously thanks to the advantage of the manual/visual modality.

Indeed, in his study, null arguments were used less frequently than in the analysis of the Balloon stories carried out by Frederiksen & Mayberry, and indices were detected occurring in isolation. Czubek also introduced a detailed distinction of referential expressions, including the distinction between semantic classifiers (SA), instrument/handling classifiers (ICL) and descriptive classifiers, or Size and Shape classifiers (DCL/SaSS) in his analysis. Moreover, he suggested constructed actions and verbal agreement as independent referential categories.

His results registered an increase in descriptive descriptions, within which he annotated DPs and NPs, and the presence of indexations in contexts where more competing referents occurred. Against expectations, however, no significant differences were found in the comparison of the two datasets, except for three distinctions: (i) a greater presence of definite descriptions used in reintroduced context in the Balloon stories, (ii) an increase of pronominal forms when they were included in the narratives through signers' personal stories, (iii) finally, a lower accessibility value of definite descriptions, constructed actions and semantic classifiers in ASL narratives with respect to the value of the same referential expressions in the Balloon stories.

As for the expressions occurring in isolation or in constellation, Czubek drew different referential hierarchies. Greater differences arose between the two types of referentiality, for example the lack of pronominal indexation and the scarcity of definite descriptions in constellation. Indeed, he noticed that highly explicit referential expressions such as definite descriptions and pronouns mostly occur in isolation, while, by contrast, highly accessible referential expressions such as verbal agreement are more frequently realized in constellation.

He detected an effect of leveraging the signal behaviour of referential expressions depending on their linear or simultaneous realization. In other words, it seems that referential forms appearing in constellation signal entities with lower mean accessibility values with respect to when they occur in isolation. It is therefore possible to suppose that their occurrence in constellation adds informativeness to the referential expressions, and may be triggered by the possibility of simultaneously seeing entities alongside their relationships. The two postulated hierarchies are reported in the two figures (35) and (36) below.

RE Form	Signals
Noun Phrase	Low Accessibility
Descriptive Classifiers/SASSes	
Indexing	
Constructed Action	
Null	
Semantic Classifiers	High Accessibility

Figure 35. The proposed hierarchy for ASL of referential forms occurring in isolation.

(ASL, Czubek 2017: 170, table 5.9)

RE Form	Signals
Noun Phrase	Low Accessibility
ICL/Handling CL	
Agreement	
Semantic Classifiers	
Null	
Constructed Action	High Accessibility

Figure 36. The proposed hierarchy for ASL of referential forms occurring in constellation.

(ASL, Czubek 2017: 171, table 5.10)

By using the same corpus from Frederiksen &Mayberry's study, and based on Czubek's (2017) findings, Ahn (2019) recently reanalysed the two categories of maintained and reintroduced items, relabelling them respectively as narrow anaphora and broader anaphora. In so doing, she tried to consider the distance that elapses between a previous mention and the reintroduction of an anaphoric item.

Like Czubek, Ahn attributed the increasing use of simpler forms to the highly rehearsed and organized nature of narrative storytelling, and the huge quantity of null arguments detected in Frederiksen & Mayberry's (2016) study. Therefore, she added an analysis of the occurrence of competing referents, which seems to significantly affect the use of syntactic categories of referentiality, and she also set specific elicitation for exploring the usage of these categories, especially in terms of neutral or locus-anchored indexations.

Her new results display a large quantity of null arguments in both narrow and broad anaphora: about 70% of null arguments arise in both anaphoric types. In light of her results, she claims that neutral indices are distinguished from indices referring to specific loci in the signing space, demonstrating that the former can mostly be

associated with pronominal forms, and the latter with contrastive expressions. However, she did not further investigate the hierarchical order of referential expressions since she focused principally on pronominal functions.

2.4 Conclusions

Pragmatic, syntactic and prosodic studies on topicality in SLs present a complex picture in which linguistic and extra-linguistic factors overlap with each other, determining the way in which the old information is managed among signers.

Interestingly, some linguistic tendencies seem to show a high degree of universality which holds true across many SLs, such as the existence of several sub-types of topics, or the syntactic properties displayed by left-dislocated constructions or hanging topics. Despite the widespread variety of terminology, common syntactic phenomena related to topicality can be recognized among SLs. In addition, prosodic elements seem also toplay an important role in signalling specific pragmatic functions, such as the use of squinted eyes in relation to knowledge that is shared between signer and interlocutor, but not prominent in the discourse.

Although many linguistic studies on topicality in SLs have been conducted, research into referentiality and communication processes among signers are still rare in the literature. Such investigations only began to be addressed quite recently and have mainly been conducted for DGS and ASL. It is interesting to note that sign language studies that analyse the way in which shared entities are encoded in the discourse depending on their informational status seem to confirm the general tendencies found in spoken languages. In particular, it seems that signers, like speakers, prefer the omission of a salient referent and inversely a more informative encoding, such as through nominal forms, for those entities which are considered less easily retrievable in the mind of the addressee. Despite these similarities, language-specific strategies are employed across different sign languages thanks to the visual-gestural modality. These referring strategies, such as the existence of predictive classifiers or role shift, or the possibility of anchoring the realization of overt constituents in space, allow for a widespread omission of the referent, at least in linguistically enabling environments.

Since such investigations have never been applied to LIS, the current study intends to expand cross-linguistic research by offering a preliminary insight into how signers, mostly from the northern part of Italy, encode referentiality across two different types of data.

The next section provides a clearer description of the dataset, informants and the tools which have been used for the present investigation.

Chapter 3.
Research Questions and methodology

3.1 Introduction

The current chapter discusses the methodology adopted in the present investigation and will deal with issues generated during the data analysis. In particular, § 3.2 outlines the questions and sub-questions that arose from the investigation and considers some previous hypotheses about the topic types of the study. § 3.3 establishes a background with respect to the cultural, social and legal status of LIS in Italy. § 3.4 focuses on the methodology, presenting in detail: background information on the signers who participated in the collection of data (§ 3.4.1), the type of data collected and the test carried out for validating linguistic theories (§ 3.4.2), and the identification criteria used for the selection of the topic items and the improvements made during the study (§ 3.4.3). Moreover, the technical toolsets and software employed for the annotation and statistical analysis of data (§ 3.4.4) are also considered. Finally, § 3.5 points out the challenges and unresolved issues of the study, while § 3.6 draws a conclusion.

3.2 Research questions and predictions

Following on from the studies on spoken and signed languages considered in chapter 2, the present research intends to investigate the phenomena related to topicality from a linguistic point of view, also considering a broad multi-theoretical perspective. Indeed, the notion of topics will be addressed by considering theoretical approaches such as those introduced in chapter 1, and by considering the notion of topichood from a prosodic, syntactic and pragmatic perspective. In so doing, the present investigation provides the first comprehensive investigation of linguistic phenomena related to the concept of topicality, especially those attesting three types of topic: aboutness topics, scene-setting topics and contrastive topics.

3.2.1 Research questions

In order to offer a clear analysis of the investigated issues, the study is divided across three chapters, which focus respectively on the prosodic (chapter 4), syntactic (chapter 5) and pragmatic (chapter 6) properties of the topic phenomena. Naturally, despite these sub-divisions, these spheres often overlap and require an additional system of cross-

references. This underlying cross-sectional system of references is essential in order to avoid simplifying the addressed phenomena, and keep track of their interrelated nature.

In order to achieve this, the following macro-research questions are examined: (i) which prosodic features are associated with the three types of topics analysed - namely aboutness, scene-setting and contrastive topics? (ii) Which syntactic properties are displayed by these topic types, especially with respect to the syntactic nature, roles, and distribution in the sentential structure? (iii) From the signer's perspective and assumptions, how are communicative choices made with respect to the informational status and accessibility of the referents introduced into the discourse?

Due to the complexity of both the analysed concepts and the articulation of the previously mentioned spheres of investigation, a further subdivision of these macro-research questions into micro-issues triggered by the study is required. In particular,focusing on chapter 4, the analytic process brought to light the following sub-questions related to aboutness and scene-setting topic types:

RQ 4.1. Which prosodic contour accompanies the realization of aboutness, scene-setting and contrastive topics?

RQ 4.1.1 Are these three topic types also separated from the rest of the sentence by prosodic boundary markers?

RQ 4.1.2 Does the presence of a prosodic marker change with respect to the type of aboutness, scene-setting and contrastive topic?

RQ 4.1.3 Is there any specific correlation between the occurrence of specific prosodic markers and the pragmatic functions that may be found in the data?

RQ 4.1.4 Concerning aboutness and scene-setting topics, is there any difference in the use of prosodic markers with respect to the type of data, especially between the two spontaneous data sets and the elicited sentences?

However, in the preliminary investigation into contrastive topics, the first research question opened a variety of interrogatives that could not have been completely addressed, since contrastive topics were only collected through elicited sentences. The lack of spontaneous data with which to compare the results, along with the reduced number of signers involved in data elicitation, makes a more comprehensive account of these topics impossible.

On the other hand, the analysis of the syntactic properties of topicality raises the following sub-questions:

RQ 5.1 What are the possible syntactic realizations of aboutness topics and scene-setting topics?

RQ 5.2 What is the syntactic nature of left-dislocated aboutness topic objects?

RQ 5.3 What is the syntactic distribution of aboutness, scene-setting and contrastive topics within a sentence?

Finally, from a pragmatic point of view, the analysis focused on question of how communicative devices, such as referring expressions, are integrated by signers with respect to their assumed informational statuses and accessibility. In so doing, only aboutness topics were considered for this part of the investigation, since aboutness topics are meant to bear anaphoric value, conveying the discourse function of a referential expression. Depending on the communicative needs, aboutness topics can be overtly realized as nominal or pronominal expressions, but they may also be omitted still bearing the aboutness topic function of the considered sentence. In this case, the investigation has proven that other linguistic cues, such as the type of verbs or the presence of some language-specific strategies, are relevant for the choice of the referential codification. Moreover, such linguistic choices may depend on factors related to the informational status of referents, considered as maintained (continued) across sentences or reintroduced (shifted). Other variables may also affect the linguistic choice of the referent and are linked to the notion of accessibility: the sentential distance between the antecedent and the anaphoric resumption, and the number of competitors that arose within this distance. This complex system of anaphoric references is analysed in two spontaneous types of data, which differ with respect to some extra-linguistic factors, such as the physical presence of a second signer or a discourse being conducted in front of a camera. All these elements triggered several related sub-questions, which are presented below:

RQ 6.1 What are the differences between overt and omitted referential strategies with respect to their shifted or continued status in LIS?

RQ 6.2 Are there specific prosodic markers accompaning overt referential expressions in LIS? If so, which are the most common markers? Do they fulfil any specific communicative function in LIS?

RQ 6.3 What is the distribution of referential expressions with respect to their informational status?

RQ 6.4 How do factors related to the notion of accessibility, such as the sentential distance and the number of competitors, affect the choice of referential expressions?

RQ 6.5 Are there differences with respect to the two types of data analysed for this investigation?

Other issues were addressed during the process of this investigation, but some caution was required. We preferred to begin with a reduced number of factors in order to avoid risking overlapping results, which would have complicated their interpretation.

In the following section (§ 3.2.2), the expectations and predictions related to these questions are outlined.

3.2.2 Hypotheses and predictions

Before the investigation, some hypotheses were advanced with respect to the prosodic, syntactic and pragmatic behaviour of topic types in LIS, based on previous studies in this domain, both in LIS and other sign languages.

Like previous studies on topicality conducted in different SLs, topics in LIS are expected to be marked by both manual and non-manual cues. In particular, aboutness and scene-setting topics are expected to be marked by raised eyebrows, as shown in previous studies on topics in LIS. In addition, aboutness topics are expected to be accompanied by squinted eyes, a marker which, in other sign languages, seems to signal shared information between the signer and the interlocutor.

As for the presence of boundary markers, predictions can be made about LIS on the basis of other studies in SL (Wilbur 1994; Sandler 1999; Herrmann 2010; Sze 2008; Tang et al. 2010) which have detected this specific prosodic function. Moreover, in LIS, studies carried out on other structures, such as relatives, which have been proposed to occupy a topic position, also detected the use of non-manual markers as prosodic boundary markers (Branchini e Donati 2009; Branchini 2007, 2014). Manual and non-manual strategies signal the prosodic boundaries of constituent domains, separating a topic constituent from the rest of the sentence. Such strategies are not expected to be mandatory, and it is possible to presume that they mostly co-occur in cases of specific syntactic constructions, such as situations displaying the syntactic displacement of topic constituents. No prediction, however, is made for a straightforward consistency between the form and function of topics.

Concerning contrastive topics in LIS, these elements are expected to be realized with an overt syntactic or prosodic marker highlighting the opposition between contrasted constituents. Linguistic strategies expressing contrast may consist of a different syntactic displacement of the contrasted entities in the signing space, or in the occurrence of a prosodic marker that enhances the opposition, such as a specular

movement of the head and the body of the signer in either the leftward and rightward or the forward and backward areas of the space.

Regarding aboutness topics, these elements may be encoded by several linguistic categories, such as nominal or pronominal expressions. They may also be omitted. In the latter instance, they are referred to as null arguments. By comparing the use of nominal and pronominal forms, pronouns in LIS are expected to be marked by the same non-manuals, which also stress the full DPs. However, it is likely that for prosodic restrictions such elements will not be stressed in the same way as nominals, especially considering their short manual realization.

As for the moved or base-generated syntactic nature of left-dislocated aboutness topics, according to van Gijn's studies of NGT (2004), subjacency in LIS is tested. However, for the purpose of providing stronger evidence for the linguistic nature of aboutness topics, strong islands are used as a diagnostic test. No prediction is made with respect to the results of the test, despite the fact that the literature in spoken languages mostly supports the theory of a base-generated nature of these elements.

In order to conclude the syntactic account of the different topic types, a syntactic distribution of the topics under investigation is considered. In particular, the expectation is that the different kinds of topics can co-occur together in the same sentence, although such behaviour is not expected to be common in spontaneous data. In order to be able to test the grammaticality of such linguistic uses, therefore, specific elicitation tasks have been set.

When considering aboutness topics, their recursion in the sentence is not expected. By definition, each sentence may display only one aboutness topic. Indeed, according to previous studies in spoken and signed languages (Reinhart 1981, 1982, Krifka 2007, Sze 2008,) sentences typically have a single aboutness topic which is a given element already present in the mental storage of the interlocutor and about which the comment expresses something new. The presence of a single aboutness topic per sentence is still a debated issue, but at this stage of analysis it is adopted as an assumption in order to allow for a clearer analysis of syntactic structure. With this in mind, certain consequences in the results should be considered, especially when analysing ambiguous sentences where the identification of the aboutness topic is not completely straightforward. In order to reduce the impact of this choise on the annotation, non-canonical and ambiguous sentences have been left aside for future research.

On the other hand, scene-setting topics are supposed to show recursion. In this case, they convey both time and locative information. Following some previous studies in SLs (Kimmelman 2014, Kimmelman & Pfau 2016), it is possible to postulate a

generalized order within the scene-setting topic category. A tendency towards preponing scene-setting topics of time to the scene-setting topic of location seems to be widespread across sign languages. The same preference may also be valid in LIS.

Finally, in relation to the referential system which has been the subject of investigation in both sign and spoken languages, LIS is expected to respect the principle of quantity. According to Grice's maxim of quantity, the information provided in a discourse should be as much as needed, not more. In line with this principle, a referent is linguistically codified depending on the degree of information required for its identification. Therefore, a referent that is considered shared, but hard to retrieve, is likely to be realized through the most informative linguistic expressions, such as in the form of a full nominal phrase. By contrast, an entity that is considered prominent in the discourse and easily retrievable is likely to be omitted or realized through less informative referential strategies, such as pronominal forms. We can expect, therefore, a greater occurrence of nominal expressions in cases of entities being reintroduced into the discourse, and a greater use of null arguments in cases of referents which are maintained as salient across sentences.

Given the importance of the extra-linguistic factors that are an intrinsic part of pragmatic studies, the collection of several types of data was planned. In fact, it is also anticipated that the different ways in which communicative processes are set among signers will produce certain linguistic effects. The physical presence of an interlocutor, for example, may affect how information is structured and managed in a conversation, depending on the assumption of the signer or the feedback given by the addressee. By contrast, Monologues, where signers are in front of a camera, and therefore only have an imaginary audience, elicit other linguistic possibilities. Furthermore, in cases of elicitation tasks that may trigger a more specific use of prosody, or affect the clarity of the exchange, some differences are to be expected.

Similarly, variations are expected to arise from considering the complexity of the plot of the narratives which have been used as a trigger for the collection of spontaneous data. In order to avoid linguistic influences coming from spoken languages, only visual input was employed. However, the two types of storiy involved in the data collection vary with respect to the number of characters and the length of the plot. In relation to the management of information, these changes are supposed to be relevant in determining the use of different communicative strategies.

In conclusion, the expectations resulting from previous studies of LIS and other sign languages were the driving force behind the development of the methodology. Predictions in particular played an important role in adding specific tests for validating

previous hypotheses and for the choice of the toolset involved in this investigation. Several experiments were conducted as preliminary tests before starting with the final version of the collecting tools. These tests improved the strategies of investigation, and, although they are excluded from the general data, they represent a crucial step in the refinement process of this study.

Despite this long process to ensure the greatest possible degree of proficiency, the present study also presents certain limitations which must be addressed in future research.

3.3 Italian Sign Language

This section intends to outline the social background and cultural developments of LIS and the Italian Deaf community. It also provides an overview of the political and legal status of this language in Italy. Indeed, a language and its referring community are intrinsically related, so it might be reductive to address the linguistic phenomena without briefly mentioning the socio-historical and political background in which LIS has grown and evolved.

The educational system has deeply affected the way deaf people were included and considered in society over the last few centuries.

A crucial step towards the improvement of the cultural and educational conditions of deaf people was fulfilled with the establishment of the National Institution for the Deaf (ENS), which was unofficially founded in 1932 as the *Deal of Padua*, managed by Antonio Magarotto and officially recognized with Law n.889/1942. Since its origins, ENS has fostered and promoted the rights and equal opportunities of deaf people. Increased awareness among the Deaf community during this period led to the reopening of the age-old debate on whether public schools should provide equal opportunities for all children.

After many protests and debates, Law n. 517/1977 stated that the families of deaf children had the right to choose either (i) to continue to attend classes at special schools (established between 1949 and 1954) or (ii) to enrol at public schools and receive the re-educational opportunities offered by public or private services. The second choice quickly became the preferred option.

A crucial step towards the improvement of educational conditions for deaf scholars was reached with Article n. 13 of Law n. 104/1992, which established the necessity of support teachers and individual communication assistants. This piece of legislation sought to facilitate and support the communicative relationships of deaf students.

One of the most interesting contemporary educational models is the bimodal-bilingual program, which provides training for deaf scholars by fostering the development of both acoustic-auditory and visual-manual communication channels. In 1989, the first experiment was promoted by the National Deaf Institute in Rome, starting with a class in an elementary school. Later, the same experiment was applied to kindergartens and was also opened to include hearing children.

Unfortunately, the absence of any national language planning officially approved by the Government, combined with the lack of funds for fostering services and tools for improving deaf students' integration, still represent serious obstacles for the final disclosure of LIS in educational and training environments.

Nowadays, in Italy people with hearing impairments represent 2% of the national population (about 60,000,000). Among them, there are only 40,000 deaf sign language users (EUD, 2014). However, LIS is also used by hearing people such as interpreters, CODA (child of deaf adults), support teachers, communication assistants and family members. Together these people constitute the total LIS community in Italy, which fosters and supports the recognition of the language, rights and the culture of the Deaf.

Political institutions have not yet formally recognized LIS as an official language. However, some public institutions, such as courthouses, hospitals, and schools may require its use in public and private situations and may facilitate communication by providing LIS courses, interpreters or linguistic support assistants. This contradictory situation creates a gap between the social status of LIS, supported by local and national associations, and its formal recognition.

To date, some Italian regions have locally recognized LIS, encouraging its dissemination and granting equal rights to Deaf people. So far, these regions are: Valle d'Aosta (2006); Calabria (2007); Sicilia (2011); Piemonte (2012); Campania (2012); Abruzzo (March 2014); Lazio (2015); Lombardia (2016); Basilicata (2017); Veneto (2018).

The consequences of the lack of an earlier formal recognition, on top of the widespread misconceptions about the language held by the hearing society, have weakened the linguistic power of LIS in the past. For many years, deaf people have been discouraged from using LIS in public, and this attitude has deeply affected the linguistic perception of Deaf signers to their own language. This condition has had different social effects on the linguistic development of LIS, and only in the last few decades have Deaf people started to claim their linguistic rights.

Italian still represents a language of prestige in the common imagination. For this reason, linguistic research on LIS should avoid any specific reference to the Italian language or to its syntax in order to obtain linguistic data not influenced by the spoken language.

This study has taken these socio-linguistic factors into account. All the experiments have been carried out to avoid linguistic influences other than LIS. Moreover, in order not to prime the signers, all of the data was collected using only visual stimuli. A mute graphic novel, mute cartoons and several pictures were used in the investigation, and LIS was exclusively employed for the introduction of all tasks.

3.4. Methodological Issues

In order to investigate the pragmatic, syntactic and prosodic phenomena relating to the information structure, it is necessary to collect both naturalistic and elicited data. Since the management of old information is strongly affected by the pragmatic and extra-linguistic context, spontaneous data was collected for better analysing how communication exchanges are structured between interlocutors. In addition, elicited data has proved to be important, especially for testing specific topic occurrences that could otherwise have been rare, such as the use of contrastive topics. Elicitation tasks have also been used as a litmus test for the simultaneous presence of topic types in the sentence, which may have been hard to find in spontaneous data, such as the combination of aboutness, scene-setting and contrastive topics.

The following sections address in detail the methodological tools and procedures that led to the birth of this study. Specifically: § 3.4.1 focuses on the native signers who have collaborated in this project, § 3.4.2 points out the type of data and the tests carried out for the sake of this investigation, § 3.4.3 deals with the criteria assumed in the selection and identification of topic types, and § 3.4.4 considers the set of technological tools that were crucial for the current study, such as the software employed for the annotation and statistical analyses. Finally, § 3.5 points out the challenges and the unresolved issues that arose during the study and still remain unsolved.

3.4.1 Informants

As previously mentioned in § 3.3, given the small size of the sign language community, the task of involving a large number of signers endowed with linguistic awareness is by no means a trivial one. For this reason, tests in LIS are often carried out with a small number of informants. Over the past three years of research several tests have been

conducted, and a total of thirteen native signers have been involved in the various data collections, however only nine native signers were considered for the purpose of the final investigation presented in this study. Among the signers, four are female and five are male, and their ages range from 21 to 52, with a total mean age of 36.

The majority of the signers come from the north of Italy, although three were born in the south of Italy and then moved to the north to study and work. All of them were born into deaf families, apart from one who was exposed to LIS during the first years of his life.
The following table displays the main information related to the signers.

Table 3. Socio-linguistic information of the native signers involved in the study.

Informant	**Gender**	**Age**	**Origin**	**Education**	**Occupation**	**Task**
LD	F	37	South Italy	Bachelor's degree	Secretary	Story-telling
MP	M	39	North Italy	Bachelor's Degree	Teacher of LIS	Story-telling Monologues Elicitation Grammatical Judgments
RO	F	52	North Italy	High school diploma, post-graduate Master.	Bank clerk	Monologues
FC	M	35	South Italy	High school diploma	Teacher of LIS	Story-telling
GC	M	43	South Italy	Master's degree	Teacher of LIS	Monologues
NC	F	24	North Italy	High school diploma	Employee	Story-telling Monologues Elicitation
MM	M	43	North Italy	Master's degree	Psychologist and psychotherapist	Monologues Elicitation
DC	F	30	North Italy	High school diploma	Teacher of LIS	Story-telling
FZ	M	21	North Italy	High school diploma	Student	Story-telling Monologues

The aim of this study is not to provide a sociolinguistic analysis of LIS, especially given the restricted number of informants participating in the research. Nonetheless, a good balance of social factors that could affect linguistic production, such as gender or geographical background, has been attempted.

It is important to note that the majority of the signers involved in the tasks display linguistic awareness about the structure of LIS, and this fact aided in the establishment of some tests based on grammaticality judgments. The signers were not informed of the research goals before starting the recordings, as previous information about the task could have affected the collection of data. All of them gave written consent before starting the recordings. Moreover, during data collection all oral or written language was excluded, in order to avoid interference. An explanation of the test was provided in LIS by the researcher, who is an interpreter and fluent L2 signer.

3.4.2 Data

The tasks set for the current investigation were personally established and managed in order to provide the appropriate stimuli for the linguistic phenomena object of investigation. Three main types of data were collected: two types of spontaneous data, and one elicitation task.

The two types of spontaneous data consist of a Story-telling between three pairs of signers, and Monologues by six isolated signers in front of the camera. The choice of this type of data presents differences related both to linguistic and extra-linguistic factors. Despite the small number of signers involved in the data collection, the findings may still be considered a representative sample of the language used within the Deaf Community. The spontaneous data, in fact, provides a more naturalistic description of the ways in which information is managed between signers. On the other hand, elicited sentences are useful for triggering the production of very specific structures or for evaluating the grammaticality of the sentences by qualitative assessments. In fact, elicitation tasks permit the production of better linguistic analyses by means of the grammaticality judgments expressed by the signers.

A risk to be avoided in the collection of data is the “Observer’s paradox” (Labov 1972), namely, an excessive conscious control that signers may exert over their production because they know that they are being recorded and observed. In order to prevent this possibility, signers were welcomed into a familiar atmosphere. In other cases, when

possible, the location for data collection was chosen by the signers from a choice of locations they frequently visit in their day-to-day lives. For example, the Bar Senza Nome, a bar established by Deaf signers in Bologna, was often used as a setting for data collection. Before starting the test, signers were encouraged to interact for several minutes in order to recreate a more naturalistic and spontaneous atmosphere.

A detailed description of the data collection is addressed in detail in § 3.4.2.1 for the Story-telling, and in § 3.4.2.2 for the Monologues. A comparison between these two spontaneous sets of data is provided in § 3.4.2.3. The elicitation task is addressed in detail in § 3.4.2.4. The other two types of tests - grammaticality judgments and a test for establishing the validity of aboutness topics occurring at the left of the sentence - are respectively discussed in § 3.4.2.5 and 3.4.2.6.

The total quantity of data analysed in all three tasks totals 2,262 items, among which 1,744 are aboutness topics, 458 are scene-setting topics, and 60 are contrastive topics. The following table summarizes the division of topic types with respect to the type of data.

Table 4. Aboutness, scene-setting and contrastive topics with respect to the type of data: Story-telling, Monologues and elicitation task.

Type of data	**Aboutness topics**	**Scene-setting topics**	**Contrastive topics**	**Total**
Story-telling	1.171	274		1.445
Monologues	484	64		548
Elicitation	89	120	60	269
Total	1.744	458	60	2.262

The two types of spontaneous data represent the main dataset considered in the analyses carried out on referentiality (§ 6). Meanwhile, the analyses related to the prosodic (§ 4) and syntactic (§ 5) properties of the three topic types under investigation have also taken into account a comparison between the spontaneous data and the elicitation tasks. In the case of contrastive topics, on the other hand, only elicited sentences were considered, since no contrastive items arose from the spontaneous data.

3.4.2.1 Story-telling

The relevant role played by linguistic contexts and extra-linguistic conditions lays a foundation for basing the linguistic analyses on spontaneous discourses, in order to recreate natural conversational exchanges. The Story-telling data was established with the specific purpose of studying the ways in which shared information is managed in discourse between signers. In order to do so, a silent graphic novel, "The Arrival" by Shaun Tan, was chosen. Three pairs of signers in three different data collection sessions were seated one in front of the other and alternatively invited to re-tell a part of the novel. The general Story was therefore divided into several sections of narrative which amounted to a mean number of 10 pieces per pair of signers, for a total of 30 sections of narrative.

Each part of the story lasts 1.73 minutes, of a total recording duration of 52 minutes. None of the signers had previous knowledge of the novel, and the presence of several animate and inanimate entities allowed a test of the ways in which previously mentioned referents were reintroduced into the discourse. Only the first mention of the referent was excluded from the count, and each referent was assigned an identification number. In so doing, it was possible to track the subsequent reintroduction of these entities into the conversation by counting the number of sentences that elapsed between a previous mention of a referent and its resumption. Moreover, this method also made it possible to count the number of competitor referents that arose within the sentential distance. These factors are important for the analysis of accessibility, that is, for understanding how reintroduced or mantained information is syntactically and prosodically encoded by signers in the discourse.

The presence of referents in this type of narration was significant: a total number of 153 entities, both animate and inanimate, arose within the three stories. An analysis of each story in isolation shows an average of 51 entities per story. The total number of referring expressions in the story, on the other hand, amounts to 1,172 items; that is, the occurrence of linguistic forms which arose independently from the entities to which they referred.

The physical presence of the two signers was expected to play a role in the communicative strategies employed in the conversation. For this reason, the pair of signers were asked to build the story piece after piece together in order to better investigate the feedback they sent each other and the means by which their common knowledge was constructed.

3.4.2.2 Monologues

Unlike the Story-telling sessions, during the Monologues, signers were alone and were asked to re-tell an episode of the silent cartoon "Bernard" in front of the camera. The selected episode of the cartoon "Bernard" is called "The Postman" and lasts for 3 minutes.

The test was established with the purpose of analysing whether the lack of a physically present interlocutor affected how the signer produces and manages the assumed old information in the discourse. Some variations were also expected, due to the conversation's lack of a specific audience and direct feedback.

Each Monologue had a mean length of 2.60 minutes, while the sum of all six Monologues was a total of 16 minutes. The Monologues present a reduced number of referents with respect to those involved in the Story-telling, and their average is equal to 5.5 referents per each retold episode, for a total of 33 entities. In contrast, the average count of referential expressions – the count of all the linguistic forms produced by the signers - in the Monologues is 80.66 items, and the total count of referential expressions in the Monologues is 484.

Differences are also anticipated with respect to the reduced number of entities involved in the cartoon and minor plot complexities. These two inherent factors, indeed, may affect how information is distributed in the discourse, as also pointed out by the test carried out by Frederiksen & Mayberry (2016) for ASL.

3.4.2.3 Comparison between Story-telling and Monologues

A comparison was drawn between the spontaneous data collected in the two different types of test, Story-telling and Monologues. The tables (5) and (6) below display how aboutness and scene-setting topic items were prosodically and syntactically produced depending on their occurrence as subject or object aboutness topic or temporal or locative scene-setting topic.

Table 5. Prosodic features related to the aboutness topics in the Story-telling and Monologues.[22]

[22] Percentages are calculated by considering the grand total between subject and object and between time and locative expressions with respect to each specific marker.

Prosodic markers	**Aboutness topics in Story-telling**		**Aboutness topics in Monologues**	
	Subjects	Objects	Subjects	Objects
Raised eyebrows	7% (78/1099)	1% (12/72)	10% (48/464)	1% (5/20)
Squinted eyes	10% (119/1099)	2% (21/72)	9% (45/464)	2% (10/20)
Head tilt back	2% (25/1099)	0% (1/72)	2% (9/464)	0% (0/20)
Eye blink	7% (80/1099)	1% (10/72)	6% (29/464)	1% (5/20)
Head nod	6% (73/1099)	1% (11/72)	1% (7/464)	0% (2/20)

Table 6. Prosodic features related to the scene-setting topics in the Story-telling and Monologues.

Prosodic markers	**Scene-setting topics in Story-telling**		**Scene-setting topics in Monologues**	
	Time	Location	Time	Location
Raised eyebrows	6% (16/95)	11% (30/179)	3% (2/6)	36% (23/58)
Squinted eyes	10% (28/95)	25% (69/179)	3% (2/6)	53% (34/58)
Head tilt back	1% (2/95)	1% (2/179)	2% (1/6)	0% (0/58)
Eye blink	7% (19/95)	10% (28/179)	2% (1/6)	33% (21/58)
Head nod	2% (6/95)	12% (32/179)	2% (1/6)	27% (17/58)

Despite few variations in the proportions, such as the percentage of marked scene-setting topics in Monologues, which is greater than in Story-telling, no significant prosodic differences arose from the corpus and the proportions between objects and subjects with respect to their prosodic markers is comparable between the two types of data.

Neither property related to the syntactic categories of aboutness topics - nominal and pronominal expressions and null arguments - that interact with pragmatic aspects, such as the informational status of these constituents, seems to vary between the two types of data. This is displayed in the table below.

Table 7. Aboutness topics as nominal (DP), pronominal (pro) expressions and null arguments (null) with respect to their shifted or continued status in Monologues and Story-telling.

Informational status	**Aboutness topics in Scene-setting**			**Aboutness topics in Monologues**		
	DP	Pro	Null	DP	Pro	Null
Continued contexts	6% (71/270)	6% (67/160)	53% (618/741)	2% (10/99)	6% (27/70)	55% (268/315)
Shifted contexts	17% (199/270)	8% (93/160)	11% (123/741)	18% (89/99)	9% (43/70)	10% 47(315)

These results are contrary to the expectation of a straightforward influence of the test's pragmatic conditions on the linguistic production. On the contrary, it seems that extra-linguistic factors, such as the physical presence of an interlocutor, or the possibility of the signer to receive direct feedback from an addressee, are not significantly relevant for the management of information. Therefore, we can conclude that the two types of data from this point of view may be considered a unique corpus. From now on, they will be presented together as spontaneous data and used together in the prosodic, syntactic, and pragmatic analyses carried out in § 4, § 5 and § 6 respectively.

A distinct scenario, on the other hand, comes from the analysis of the inherent differences of the two types of narratives proposed, that is, the numerical variation of the entities in the Story-telling and in the Monologues, and the differing levels of complexity of the two plots. A different management of the shared knowledge, that isreflected in a distinct way to linguistically encode referents, arose from the comparison of the two types of data. Simpler narratives, such as Monologues, seem to have an impact on how information is reintroduced into the discourse with respect to the sentential distance allowed between an anaphoric reference and its antecedent. This distance is greater in the Monologues than in the Story-telling, and this split may be due to the different levels of plot complexity in the two types of data. Similar differences, however, can also be explained by the relatively small number of entities present in the Monologues, and the increased number of entities in the Story-telling.

Inherent variations are not only displayed with respect to the sentential distance, but are also related to the number of competitors arising within this distance. From the findings, it seems that Monologues allow more competitors than Story-telling does, and, again, this could be due to the fact that the entities involved in the Monologues are fewer in number than those involved in the Story-telling. It may be the case that linguistic contexts with fewer referents allow for the presence of more competitors across sentences, since each referent remains salient and easily retrievable. On the contrary, in a more complex plot, where referents are not all directly identifiable, there may be some restriction in the management of competitors at play, in order to guarantee the unambiguous retrievability of the referents. Such distinctions are presented and addressed in detail in § 6.3.

3.4.2.4 Elicited sentences

As previously mentioned, elicitation tasks are crucial for understanding what a language does or does not allow. Indeed, along with grammaticality judgments, elicitation is useful for qualitative consideration of the grammaticality of sentences. Sentences that have been collected through elicitation tasks total 269 items (of which there are 89 aboutness topics, 120 scene-setting topics and 60 contrastive topics). Two elicitation tasks were established: one for collecting aboutness and scene-setting topic items, and one with the purpose of triggering contrastive topic items. The first test was submitted to six signers, and the second to three signers.

The elicitation was completely based on a card game with pictures displaying subject, object, verb and temporal and locative information, all randomly distributed in a table. The signers were asked to produce a sentence by using the cards, and in the process any written or oral input was excluded. In all the productions, informants were also invited to use scene-setting topics in the form of temporal adverbs or locative phrases in order to be able to investigate their occurrences with the other topic types.

In the first test, the production of two types of sentence was stimulated: (i) sentences with subject aboutness topics, and (ii) with object aboutness topics. The signers produced 31 aboutness topic subjects and 28 aboutness topic objects, as well as 59 scene-setting topics of time and 42 scene-setting topics of location. In line with the goal of the test, two main characters were identified: Gianni and Maria, and signers were informed of details about their backgrounds and tastes. After their introduction, other cards were randomly displayed on the table showing an action, an object and an indication of time and place. The informants were told to produce two sentences based

on two different contexts, differentiating them with the letters A and B. The first context (A) was intended to trigger subject aboutness topics and the second context (B) was intended to stimulate the production of object aboutness topics.

In the first context, no particular information was provided and signers were invited to produce a sentence by using the character's description. The second context, on the other hand, was designed to trigger the production of objects, pictures representing the objects of the sentence were presented as if that entity was already well-known between the signer and the interlocutor. In so doing, signers were likely to restructure their sentences by realizing aboutness topic objects.

Figure (37) below presents some examples of the cards and the first sentences produced by the signers after the first (Example 130a) or second (Example 130b) context.

Figure 37. Cards for collecting elicited sentences

(130)

(a) Context A: *John is a bank clerk, he loves eating fish and he has a dog. He intends to buy a house.*

FINALLY TOMORROW JOHN HOUSE BUY

'Finally, tomorrow, John will buy a house'.

[Mi_el_2A]

(130)

(b) Context B: *For a long time Gianni wanted to buy a house. But he did not like any until now. Finally, during this week he found his perfect house. The house is big and bright, with a wonderful garden. He has no doubts, tomorrow he will go to the agency and buy it.*

HOUSE IX-3 FINALLY TOMORROW JOHN BUY

'As for the house, finally, tomorrow John will buy it'.

[Mi_el_2B]

The second elicitation task, on the other hand, concerned the production of contrastive topics and was submitted to three signers. Since each stimulus contained two contrastive items, 60 contrastive topics were produced in total. Of them, 30 were contrastive subjects and 30 contrastive objects. Since the stimuli also contained aboutness topics and scene-setting topic items, these were also included in the test, for a total of 15 aboutness topic objects and 15 aboutness topic subjects, 6 scene-setting topics of location and 11 scene-setting topics of time.

Once again, the signers were asked to produce sentences after observing the pictures distributed on the table. This time, the pictures were not randomly spread over the table; instead, the way in which they were placed was meant to provide the answer to the question.

The signers were therefore invited to answer ten questions about the two characters who were also introduced in the first elicitation task, namely Gianni and Maria. Two different types of question (again A and B) were asked in order to trigger, in the first case, a parallel contrast between the two subjects, and, in the second case, a parallel contrast between two objects. As the pictures (38) and (39) and the two examples (131a) and (131b) below respectively display:

Figure 38. Cards for collecting contrastive topic subjects.

(131)

(a) Question 1A: *As for the dog, what do John and Mary think?*

DOG J-O-H-N LOVE IN_CONTRAST M-A-R-Y HATE

‘John loves the dog while Mary hates it’.

[Ma_el_1C]

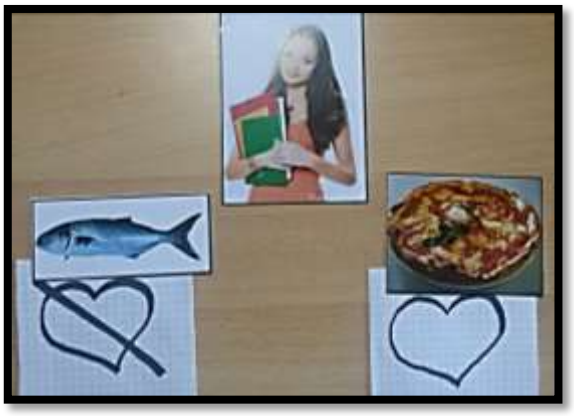


Figure 39. Cards for collecting contrastive topic objects.

(131)

(b) Question 6B: *What Mary think about the fish and the pizza?*

IX-3 FISH MARY HATE IN_CONTRAST PIZZA LOVE

‘As for the fish, Mary hates it, while she loves pizza’.

[Na_el_6C]

The experiment to elicit contrastive topics was considered a preliminary test for starting an investigation on these topics. In order to compare this with the remaining topic types, more data would need to be collected. Moreover, since this type of topic was not found in the spontaneous data, it is not comparable to aboutness and scene-setting topics from this point of view. This is why the contrastive topic items are only preliminarily addressed in the following analyses.

3.4.2.5 Grammaticality judgments

Concerning the syntactic section (§ 5.3), a preliminary test was carried out based on the grammaticality judgments of a signer with a high awareness of LIS. This test sought to verify the acceptability of a specific grammatical structure containing extraction from a strong island.

Strong islands are structures which create boundaries that are harder, or impossible, to cross without the sentence becoming ungrammatical, as previously addressed in § 2.2.2.3. An example of a strong island is a relative clause whose boundaries cannot be crossed by extracting an item from it. Relative clauses represent a reliable syntactic test for establishing the moved or base-generated nature of the investigated constituents (for further information about this, see Ross 1984).

As stated before, extraction of a constituent from a strong island leads to ungrammaticality. Therefore, this test is used as a diagnostic tool for movement, because if in the presence of an item occupying a position outside the relative clause (albeit being an argument of the verb of the relative clause) the sentence is still grammatical, then the constituent should be considered not moved from the internal part of the sentence, but base-generated in the left-periphery of the sentence.

In order to test the syntactic nature of aboutness topic objects that may occur in the initial part of the sentence, this test was established by creating ten contexts and associating them with ten possible answers. For the previously mentioned reasons, the whole test was conducted in LIS. The signer was asked to judge the grammaticality of these sentences. If the sentence was considered ungrammatical, the possibility of movement of the constituent was taken into account.

By contrast, if the proposed structures were considered grammatical, a reasonable assumption of the base-generated nature of aboutness topic objects was considered. If the signer considered the sentence grammatical, he was asked to reproduce each sentence on the basis of the provided context. However, acceptance alone is not enough to clearly interpret such structures as instances of left dislocation objects. Other cues have been considered: for example, the presence of prosodic boundaries separating the potential left-dislocated object from the remaining part of the sentence, or the specific use of non-manual markers.

The sentences were all judged grammatical, although the signer reproduced them using different structures. In the case of left-dislocated structures in which the topic aboutness object was reasonably base-generated in the left periphery of the clause, no doubt arose in their syntactic interpretation. Conversely, in the sentences whose structure could not be univocally interpreted, two possible analyses were considered. The paucity of the tested structures, however, does not exclude the possibility that they involved a different construction. The test should therefore be approached as a preliminary investigation into the syntactic nature of aboutness topic objects.

The ten proposed sentences and the respective contexts provided to the signer are reported below. Aboutness topics are highlighted in bold.

1) Context: There is a cat living in the street, but no one has ever seen it. Do you know someone who has seen it?

re eb+ re eb

CAT$_x$ IX-3$_x$ YESTERDAY CHILD$_i$ PE$_i$ SEE DONE IX-1 IX-3$_i$ KNOW

'As for the cat, I know the child who saw him yesterday'.

2) Context: The maths test scares everyone. Yesterday, students did not go to school in order to avoid it. I know the professor was very angry. Do you know anything about this test?

re eb+hn re eb+hn

TEST$_x$ PE$_x$ CHILD$_j$ DIFFICULT PROFESSOR STIMULATE$_j$ SAME

'As for the test, the professor yelled at the child who did not do it yesterday.'

3) Context: Everywhere people are speaking about a book for children, but children seem not to like it. Do you know someone who liked it, instead?

sq eb+hn re eb

BOOK$_x$ PE$_x$ CHILD$_j$ READ$_x$ DONE TOMORROW IX-2$_{pl}$ MEET

'As for the book, today I meet a child who read it yesterday'.

4) Context: The audience did not enjoy the movie. Have you met someone who has seen it?

re eb+hn re eb

MOVIE$_i$ IX-3$_i$ FRIEND$_x$ SEE$_i$ DONE PE$_x$ IX-1 TOMORROW WE MEET

'As for the movie, today we meet a friend who has seen it'.

5) Context: The cake for your sister's birthday is ready, but I do not know if someone has paid the pastry chef. Do you know if someone has paid for it?

re eb++

CAKE$_i$ IX-3$_i$ PERSON PREPARE$_i$ PE$_j$ MUM PAY$_j$

a: ‘As for the cake, today mum paid the pastry chef who prepared it yesterday’.
b: ‘As for the person who prepares the cake, mum has paid him/her’.

6) Context: The homework the English teacher sets is boring and the children never want to do it. Therefore, yesterday the teacher changed his methodology, hoping to better stimulate the students. Do you know what he did with respect to the homework?

sq re eb+hn

HOMEWORK$_i$ CHILD$_x$ DONE PE$_x$ PROFESSOR$_j$ ARWARD $_j$GIVE$_x$.

a. ‘As for the homework, the professor rewarded the children who did it’.
b. ‘As for the children who did the homework, the professor gave them an award’

7) Context: John has never kissed anyone. I know yesterday a girl probably kissed him for the first time. Do you know anything about John and this girl?

re eb sq eb+hn fe

JOHN GIRL IX-3 KISS DONE IX-3 PERSON WHO IX-1 KNOW NEG

a: ‘As for John, I do not know the girl who kissed him’.

8) Context: Yesterday you were wearing a beautiful shirt at the party, but a child spilled his ice-cream on it. I am so sorry! Do you know anything about the consequence of this accident with your shirt?

re eb re eb+hn

SHIRT$_x$ PE$_x$ CHILD$_i$ MAKE_DIRTY$_x$ CL:STAIN$_x$ MUM YELL_AT

‘As for the shirt, today the mum yells at the child who made it dirty’.

9) Context: At the festival yesterday someone stole a wallet, but then no one was ever kept updated about this. Do you have any news about the wallet and the thief?

sq eb+hn eb+hn

WALLET$_j$ IX-POSS1 STEAL$_j$ THIEF$_x$ IX-3$_x$ PE$_x$ POLICEMAN CAPTURE$_x$ DONE

a: ‘As for the wallet, the policeman found the thief who had stolen it yesterday’.
b: ‘As for the thief who had stolen the wallet, the policemen found him yesterday’.

10) Context: In the granny's basement the cheese is full of holes, I supposed it is a mouse. Do you know anything about how to solve the problem with this cheese?

sq re eb+hn

CHEESE$_i$ SASS:round MOUSE$_x$ EAT$_i$ PE$_x$ IX-1 CAPTURE DONE$_i$

a: 'As for the cheese, I have captured the mouse that ate it'.

b: 'As for the mouse who has eaten the cheese, I have captured him'.

In the sentences above, time adverbs were also used in some cases as clause boundaries, since, as can be seen in § 2.3.2.1.4, these elements in LIS function as scene-setting topics and are placed in the leftmost periphery of the clause. Further results and comments about this test are addressed in § 5.2.

3.4.2.6 Aboutness test

Among others, a test was submitted to two signers in order to better investigate aboutness topics. In so doing, five pairs of sentences for a total of ten sentences have been recorder together with another signer, and then displayed to the two expert signers by asking them which the main topic upon which the sentence predicated something new was.

The five pairs of sentences were randomly displayed in order to avoid any mechanical judgments. The test was composed in the following way: five sentences presented a subject in sentence-initial position, generally preceded by some scene-setting topics, while the other five sentences presented the objects in sentence-initial position, maintaining the same subject and verb of the equivalent pair. An example of these pairs of sentences is presented below in (132) and (133). Specifically, in the first sentence the aboutness topic is supposed to be DAD, while, in the second sentence, the aboutness topic is supposed to be TAX.

re eb eb

(132) TOMORROW DAD TAX PAY HAVE_TO NECESSARILY

'Tomorrow, as for the dad, he has to pay the tax necessarily'.

re eb

(133) TOMORROW TAX DAD PAY HAVE_TO NECESSARILY

'Tomorrow, as for the tax, the dad has to pay it necessarily'.

Interestingly, one of the two signers accepted three out of five sentences only after a syntactic and prosodic correction. In fact, he repeated the three sentences by using a different prosodic contour and a different use of the signing space, as displayed in the example below.

	sq	re	eb+hn
(134)	TODAY	TAX_a	DAD PAY_a

'Today, as for the tax, the dad paid it'.

The modifications concern the locus of the signing space, which in this case enhances the agreement between the verb PAY and the object TAX, and also concerns the use of squinted eyes as a marker for the time adverb TODAY. The change of the adverb from TOMORROW to TODAY, instead, should not be considered significant: in fact, it was accidentally used in place of the previous adverbs, as the signer also confirmed.

These tests provided evidence about the validity of linguistic theories which consider aboutness topics as the first elements addressed in a conversation. Moreover, the test turned out to be helpful in the identification procedure, which is investigated in detail in § 3.4.3.

The other sentences are presented in Appendix I.

3.4.3 Identification Criteria

The current section provides information about the identification criteria employed for the selection of the three types of sentences, and for describing how referent expressions were identified mainly with respect to the calculation of the sentential distance occurring between the antecedent and its anaphoric resumption.

Concerning the topic types, three macro-categories of topics were taken into consideration in the current study: aboutness topics, scene-setting topics and contrastive topics. As for aboutness topics, at this first stage of investigation, only prototypical topics were selected, namely, given aboutness topics following the definition of Gundel (1988) and Reinhart (1981, 1982) for spoken language and Sze (2008) for sign languages. In so doing, non-prototypical alignments, such as information which is probably familiar to the speaker, but not previously mentioned in the discourse, were excluded. Topics likely to be interpreted as aboutness topics were identified by selecting a DP or a NP whose referent was already present in the context, or a pronoun involving

an already shared entity and linked to the previous discourse. However, Reinhart (1981), Gundel (1988) and Sze's (2008) criteria were adapted, with personal improvements arising from specific situations addressed in the current study, and by following further advice found in Götze et al. (2007).

In light of the aboutness topic test and the aforementioned studies, the following conditions for topic identification, which contain both pragmatic and syntactic indications, were considered:

(i) If in the sentence-initial position there is an identifiable clause-external nominal expression (either a determiner phrase or a nominal phrase) which was previously mentioned and represents what the sentence is about, this noun is marked as an aboutness topic.

(ii) If there is no identifiable clause external topic, but the subject is definite and was previously introduced, it is considered a topic.

(iii) If only the object is old information, it is considered a topic.

(iv) If there are two definite nominal expressions (the subject and object), which are both given, and the object is fronted or separated from the rest of the sentence by a prosodic break, only the object is analysed as an aboutness topic, while the subject is encoded as another kind of topic.

(v) Aboutness topics can also be omitted from a sentence. In this case, in simple (S)-V structures no doubt arises on the choice of the omitted aboutness topic as the subject of the sentence. Other sentences with an O-V structure, however, require the establishment of the aboutness topic in order to choose between the omitted subject and the overt object. In most cases, the verb was clearly referred to as the subject (for example if the object was inanimate and the omitted subject was animate and the verb clearly referred to the subject). In similar cases, the surrounding linguistic context may also be helpful for understanding the function of the omitted subject as the aboutness topic of the sentence. However, in other cases, the object was likely to be the aboutness topic of the sentence, because it was particularly marked from a prosodic perspective, leaving doubts about its identification as aboutness, or because it triggered a change in the referring entity evident from the subsequent sentences. In these latter cases, it is possible to hypothesise a structure such as O-(S)-V, therefore the object is selected as an aboutness topic. Ambiguous cases have been excluded.

(vi) Temporal constituents, in the form of time adverbs, and locative adverbial constituents, in the form of temporal or locative propositions, adjoined to a main sentence are considered scene-setting topics.

(vii) When a scene-setting topic location represents the argument of the clause, referring to what the sentence is about, these elements are interpreted as aboutness topics. Some of the ambiguous cases were either first submitted to a native signer's judgment or were excluded from the corpus.

(viii) Aboutness topics can coexist with a scene-setting topic item in the same sentence, as well as with contrastive topics, but for definition only one aboutness topic per sentence is allowed.

(ix) Sentences without topics (sentences whose only purpose is to introduce new information) do exist, and they are defined as presentational sentences: for example, 'there is a dog', or as event reporting sentences, such as "Something very bad has happened".

The selected aboutness topics were then considered as referential expressions in the study about referentiality addressed in § 6. The same identification criteria also hold true for the selection of referring expressions in LIS.

For the study on referentiality, the methodology described in Kimmelman (2014) and Frederiksen and Mayberry (2016) was taken as a model. It differentiates continued topics (mantained topics) from shifted topics (reintroduced topics). The former represents the referents that remain salient across more than one sentence, as displayed in the abstract structure and the corresponding example in (135) and (136) below:

(135) …/S_x O V / S_x V / $(S)_x$ V /…

(136) DOG IX-3_x BONE CL:TAKE / IX-3_x BARK / BITE.
'The dog takes the bone / he barks / (and) bites.

On the other hand, topic shift is an entity which is reintroduced into the discourse at either a short or long distance from its antecedent. The two examples below (137) and (138) in which DOG IX-3 exemplifies a case of short distance, while BEAR IX-3 exemplifies a case of longer distance (the small number close to the / indicates the identification number of the sentence).

(137) S_y O V…/S_x O V / S_y V / S_x V /…

(138) .../ BEAR IX-3 NEWSPAPER THROW $_3$/ […] DOG IX-3 NEWSPAPER CL:TAKE $_{15}$/ BEAR IX-3 HANGRY $_{16}$/ DOG SPARK $_{17}$/…

Since the change in topic is also reflected in the linguistic context of the sentence, the terms shifted and continued contexts or reintroduced and maintained contexts is also

used in this dissertation, and always refer to the same linguistic phenomena of shifted and continued topics.

In the case of the overt realization of a referent, aboutness topics were identified in the form of both nominal and pronominal expressions. Nominal expressions without determiners are called nominal phrases and indicated as NPs, while nominal expressions with overt determiners are defined as determiner phrases and indicated as DPs. Only strong pronouns, which are not necessarily space-anchored, are considered in this dissertation. Indeed, as stated in § 2.3.4.1.2, only strong pronouns display the syntactic properties and distribution of nominal expressions, such as arising in isolation and being able to be dislocated in the left periphery of the sentence.

In the case of omitted subjects, several referential strategies were detected in relation to the verb types, such as agreeing verbs or plain verbs, or to other language-specific elements, such as predicative classifiers or role shift. The use of explicit clitics or weaker pronominal forms in some cases in LIS can also bear referential functions. Weaker pronominal forms are distinguishable from strong pronouns because they last for a shorter time. However, there were too few occurrences of weaker pronominal forms bearing resumptive functions in the spontaneous corpus and for this reason they have been excluded from the analysis. Moreover, since further studies on clitics and other weaker forms with referential function in LIS are required, at this stage of analysis these elements have only been considered in some elicited sentences.

For the purposes of the current research, five referential strategies occurring in the case of null arguments have been considered: null arguments with agreeing verbs, null arguments with plain verbs, predicative classifiers, role shift and the combination of agreeing verbs and predicative classifiers. Neither the sub-types of agreement, such as directional versus argumental agreement, nor the other combinations of referential strategies, such as role shift occurring with predicative classifiers, nor indeed the subdivision between semantic and handling predicative classifiers, are considered in the following analysis. Further distinction between referential expressions is left aside for future investigations.

3.4.4 Toolsets and methodology

In the present section, information about the recording processes (§ 3.4.4.1), data annotations (§ 3.4.4.2) and statistical analyses (§ 3.4.4.3) is provided. The annotation procedure was equally applied to both spontaneous and elicited data.

3.4.4.1 Data recording

The data recording took place in several locations: at the PhD office of Ca' Foscari University of Venice, at the University of Milan Bicocca, at the Deaf Association in Milan, at the "Senza Nome" Bar in Bologna and in other bars regularly frequented by the signers in Milan. The private office of one of the signers was also often used for data collection.

In the case of the Story-telling data collection, two signers sat one in front of the other and two cameras fixed to tripods were directed at them, in a slightly lower position than the signers, facing them at an upward angle. A schema of their positions is presented below.

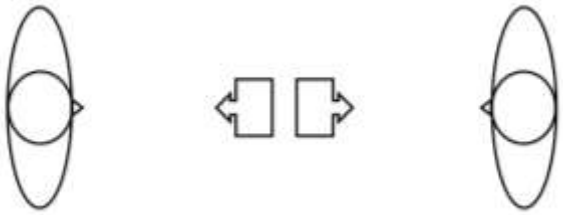


Figure 40. Signers' setting for Story-telling data collection.

In these types of recording, specific attention was paid to the brightness of the room, and the seats were positioned so that they were lit either by windows or lamps.
For the Monologues and Elicitation tasks, data collection was easier to set up, as only one signer was present in each session. Signers were invited to take a seat, paying attention to their background: in some cases, such as in the two universities, a green background was available for the recording, while in other cases a blank wall was preferred. The camera was kept positioned at a lower angle than the face of the signer, so as not to be too invasive.

A picture of the position assumed by the signer for these types of recordings is shown in (41) below.

Figure 41. Position of the signer in front of the camera.

As is usual practice, the first few minutes of the recording were excluded from the analyses. The following section addresses how the data was annotated.

3.4.4.2 Annotation of data

The data collected was exported onto a computer in the form of an MP4 file and specific folders were created in order to keep each type of data and each session. The data was then analysed through ELAN, a professional software developed by The Language Archive, a unit of the Max-Plack-Institute for Psycholinguistics (Nijmegen, The Netherlands, see Crasborn and Sloetjes 2008). Thanks to ELAN, a researcher can add unlimited annotations to audio and/or video files.

This software is particularly useful in the analysis of sign language corpora since it allows visual material to be annotated, and benefits from several functions, such as the ability to upload up to four video clips simultaneously, or to slow the speed of the video. This function is crucial for better analysis of prosodic markers, i.e. non-manual cues accompanying signs, which can sometimes be very hard to detect given the fast pace of the signed discourse.

Depending on the type of annotation, a linguist can create his or her own template, by establishing the annotation entries that refer to the investigated phenomena.
An annotation may consist of a sentence, a word or gloss, a comment, a translation or a description of the specific linguistic phenomena observed in the media. Once the template is established, it can be applied to the video tapes by uploading several videos. The annotations can be structured in multiple layers, which are called tiers.

The picture below in (42) illustrates an example of the ELAN interface.

Figure 42. ELAN interface

As visible in the picture (42) above, the first caption refers to the video uploaded in the software, Caption 2 refers to the tabs panel where many functions are available, such as the tools for setting the rate of a video, or the list of annotations made, which is divided according to tier. Caption 3 indicates where the tiers are displayed, along with their hierarchical relationships. Finally, Caption 4 captures the annotation panel in which signs can be annotated in coordination with the time-line above.

The small red pointer, which is highlighted by a red circle, indicates the position of the visualized frame in relation to the whole video. Similarly, the long, red line in the annotation panel points to the specific frame currently being viewed on the screen.
Glosses can also be inserted into a specific tier, which allows an identification label that exactly translates each sign to be established through a word or a combination of words and symbols.

Moreover, in each tier, it is possible to establish a fixed controlled vocabulary in order to easily choose the appropriate label. This is particularly useful in cases of macro-linguistic phenomena that need to be split into sub-categories, and subcategories can in fact be inserted as entries of controlled vocabulary.
In the current research, the coded tiers related to the topic types and their information statuses. A summary of the considered annotation entries is presented below:

(i) Clause: in which a sentential segmentation was annotated.
(ii) Glosses.
(iii) Types of topic: aboutness, scene-setting or contrastive topics.

(iv) Non-manual markers related to brows (raised, furrowed), eyes (squinted wide, blink), chin (up, down), head (right, left, forward, backward, nod) and body (right, left, forward, backward).

(v) Referential expressions: explicit (namely DP, NP, pronouns overtly realized) and implicit (null arguments with respective referential strategies: agreeing verbs, plain verbs, predicative classifiers, role shift, combinations of predicative classifier and agreement features).

(vi) Information status of constituent: shifted or continued.

This procedure schema was applied to all collected data, and I made the annotations myself. Doubtful cases were submitted to the judgment of native signers who were collaborating in the linguistic analysis.

3.4.4.3 Statistical analyses

Once the data was annotated, a specific file was created through the software Excel, a Microsoft program that uses spreadsheets in order to organize data by using several operational formulae and functions. The topic annotations were then exported from ELAN to Excel and, once there, were structured into a larger table. The columns of this table contain all of the entries and sub-categories previously presented in the tiers, while glosses of the topic sign were added in single rows, as displayed in the picture (43) below, which provides a view extracted from the full columns:

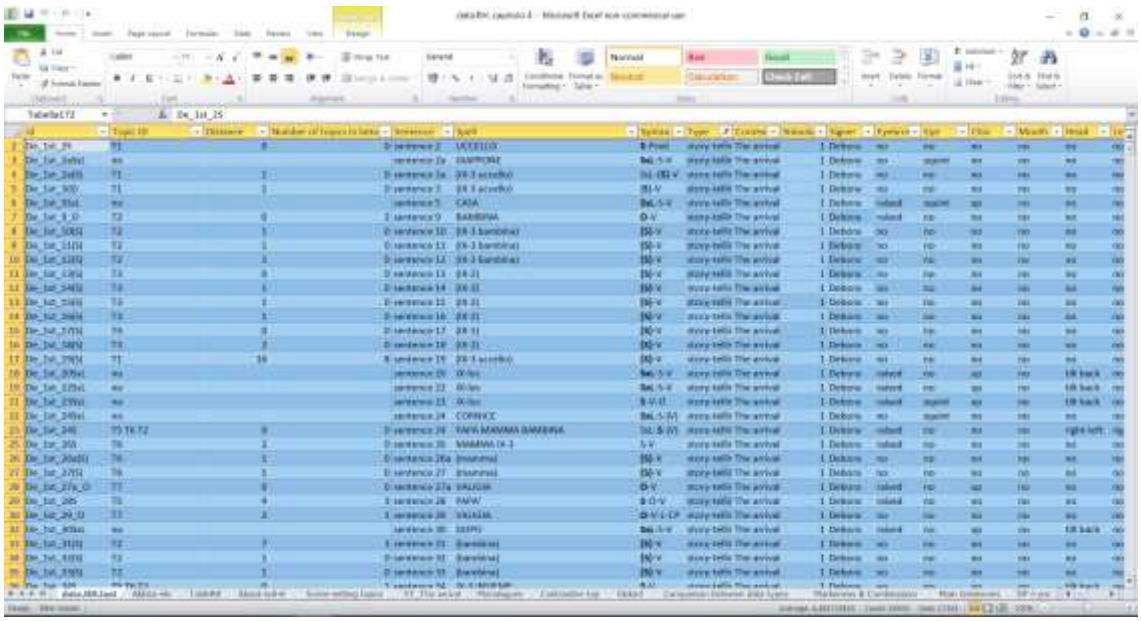


Figure 43. Dataset in Excel.

43 columns were established by starting from an ID-code that identified each gloss sign and combining this with another specific identification number used only for referential aboutness topics.

Functional information about the data types was distributed in a set of four columns indicating the identification of the signer, the type of data collected (namely Story-telling, Monologues or Elicited sentences), the visual text from which the data was triggered (the silent novel "The Arrival", the cartoon of "Bernard the Bear" or the elicitation cards), and the number of stimuli (the number of sections of narratives re-told by the signers). Other columns contain more technical information, such as the number of sentences to which the topic belongs, and the syntactic schematic structure of the sentence.

Finally, the remaining columns contain the core details of the annotation procedure: the type of topic (aboutness, scene-setting, contrastive), or the syntactic aspects of the item realized, such as their realization as DP, NP, pronouns, null arguments, or their syntactic description as subject or object aboutness and contrastive topics, or as time or locative scene-setting topics. Non-manual markers were then inserted into the columns, recalling the division of the ELAN entries. Finally, the displacement of the structures was considered by annotating the fronted position of objects or the moved position of subjects.

Other columns were added once some preliminary data results were available. For example, some specific combinations of non-manual markers that have proved to be commonly spread across the dataset were established as fixed prosodic entries, such as the pair of non-manual markers raised eyebrows and squinted eyes. Other sheets were then adjoined to the main one in order to deepen the analysis of specific phenomena. For example, the sheets were divided on the basis of the type of data.

The establishment of such datasets allows for the analysis to be carried out by a specific Excel statistic tool , the pivot table. This table summarizes and reorganizes the data from selected columns and rows in a table, and generates calculations and reports. Picture (44) below presents an example of a pivot table that analyses aboutness, scene-setting and contrastive topics with respect to the data.

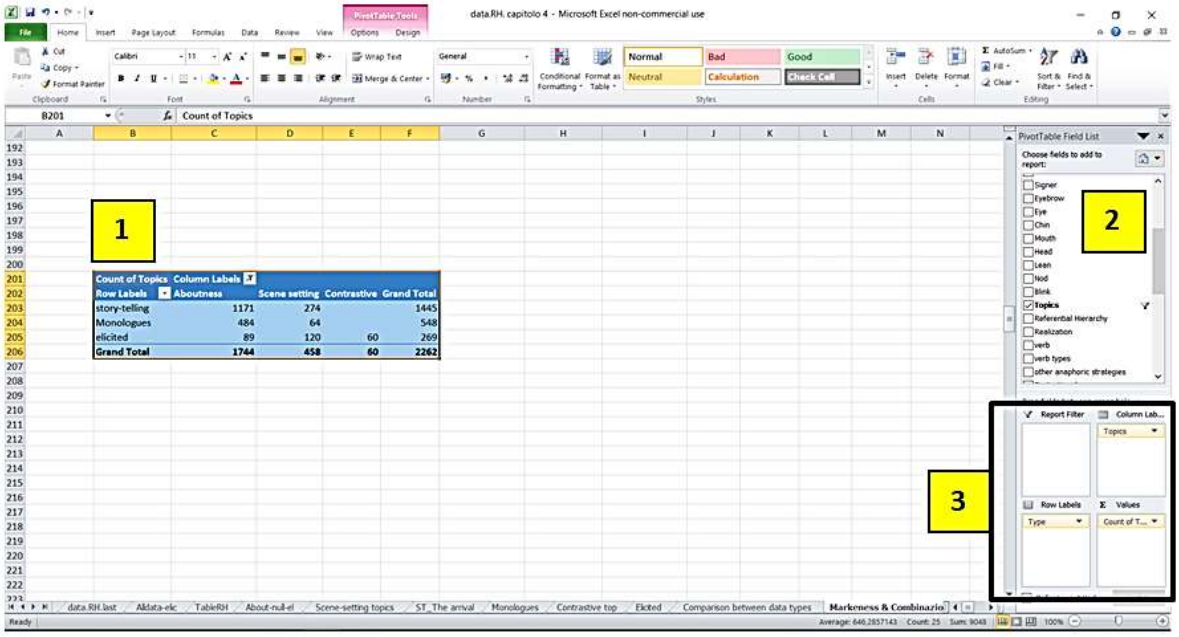


Figure 44. Pivot table

Caption 1 illustrates the pivot table. Caption 2 is the panel from which the column entries are visible and selectable. Caption 3 allows the establishment of relationships between entries which will then be operated via in the pivot table.

Excel was crucial for carrying out the initial analyses of the data, and for the results commented upon in § 4 and § 5. However, based on the analyses carried out thanks to these tools, a more complex statistical model was required. In response to this need, further analyses were carried out using a different program, the software R.

The software R is a programming language and free-access software which is used for statistical analyses and for creating graphics. It was invented as an implementation software in 1992 by Ross Ihaka and Robert Gentleman at the University of Auckland (New Zeland) after an initial project established by John Chamber in 1976 at Bell Labs (New Jersey). The software can run statistical and graphical analyses and has become quite popular in the last few years as a statistic tool.

It is possible to develop both linear and non-linear models besides the more traditional statistical tests and these can be used in combination with a set of packages. It turned out to be particularly useful for the purposes of the current dissertation. In our case, an integrated development environment for the software R was used, called Rstudio. This allowed the unification of several functions together, and its interface, which is more user-friendly, is shown below:

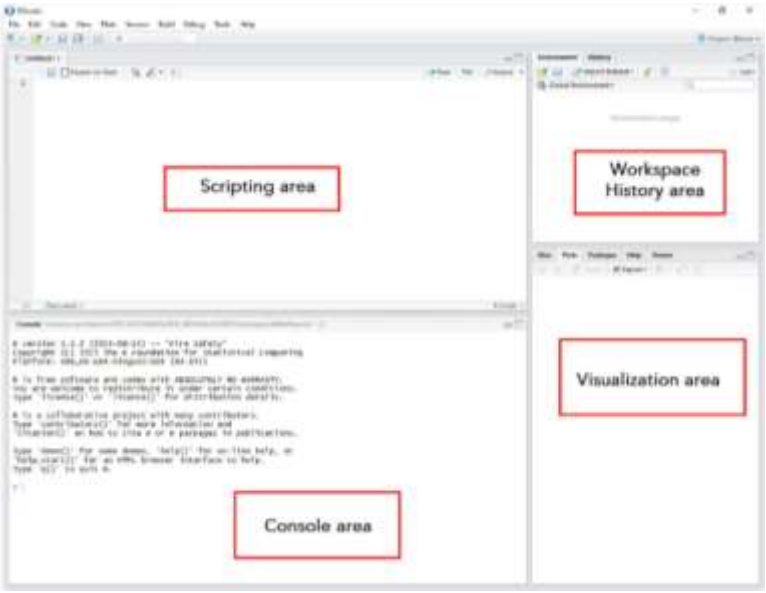


Figure 45. Interface of the software Rstudio.

(reported from Ciaburro Giuseppe. Web site "Programmare con"[23])

In the scripting area, it is possible to insert the formula and the script. In the console area, commands are run and visualized. In the workspace area, it is possible to see a list with all the created objects, and to import the dataset. Finally, in the visualization area, packages can be uploaded. In this area graphs are also visualized.

For the purpose of testing the correlation between all linguistic phenomena considered in the study, both dependent and independent variables had to be considered. An independent variable is the factor that the experiment voluntarily controls or changes in order to test its effect on the dependent variant, and it is placed on the x-axis. A dependent variable is affected when the independent variable is altered, and the dependent variable is the variable being tested or measured in a scientific experiment. It is set on the y-axis.

In a linguistic test, variables are not only numerical, but are generally also categorical. In order to investigate the correlation between the investigated elements, mixed-effect logistic regression models were developed, by considering both the categorical and numerical variables. The numerical variables in this study are the sentential distances between antecedent and anaphora and the number of competitors arising within this distance. The categorical variables that were considered, on the other hand, are the absence versus presence of non-manual markers, such as squinted eyes and head tilt back, the binary category shifted versus continued topic, which refers to the informational status of references, the syntactic realizations of referents, such as DP

[23] http://www.ciaburro.it/rstudio

versus pronouns or overt realizations (namely both DP and pronouns) versus null arguments, and a variable related to the type of data (monologue vs story-telling). In addition to the fixed predictors, the model also takes into account the random factor "signer".

The datasets were also established in accordance with the type of statistical analysis being run. Three types of dataset were employed:

LIS1: presents all the aboutness and scene-setting topic items occurring in the spontaneous data.
LIS2: presents a restriction of the data by only considering the aboutness topic items occurring in the spontaneous data and realized as overt (DPs and pronouns) and null arguments.
LIS3: presents a further restriction of the dataset by only selecting overt aboutness topic items, i.e. DPs and pronouns.

Other modifications of the dataset were completed in order to clean up the outliers within the data and to create a model with numerical variables. In fact, after having annotated the distance that elapsed between antecedent and anaphoric resumption and the number of competitors, a widespread range of these variables arose. Specifically, the sentential distance ranged from 0 to 639 and the number of competitors ranged from 0 to 59. However, these results cannot be considered to be representative of the behaviour in the majority of the cases. In fact, in cases of sentential distances, the larger quantity of data was distributed in a distance ranging from 0 to 15, and the occurrences which exceeded this range were rare and spotted. Similarly, the larger number of competitors was distributed within a range from 0 to 6, while the other occurrences (from 7 to 59) were mere outliers. Therefore, in order to maintain the accuracy of the results, two more datasets were created:

LISdist: in which all the outliers occurring as numerical measures of the sentential distance from 16 to 639 were excluded from the count.
LIScomp: in which all the outliers occurring as measures of the number of competitors from 7 to 59 were excluded from the count.

In order to calculate the significance of the correlation between prosodic syntactic and pragmatic phenomena, a mixed-effects logistic regression model was used. A mixed-effects logistic regression model can include both fixed and random effects. The term effect refers to a variable which can influence the dependent variable. An effect is considered fixed when its value cannot be changed across individuals unless it distorts

the factor: a common example of a fixed factor is gender. In contrast, a random effect displays variations across individuals, in the present study the random effect considered refers to those subjects involved in the study.

Before creating a mixed model, the function glmer is required. This function allows a generalized linear mixed-effects model that predicts response variables with no-Gaussian distribution to be created. Glmer is employed with categorical dependent variables and it considers binomial outcomes. In (139) below an example of the glmer formula employed in the current study is outlined:

(139) Model1<- glmer (dependent variable ~ independent variable$_1$ * independent variable$_2$ + (independent variable$_1$ * independent variable$_2$ | random effect), data=dataset_name, family=binomial)

A concrete example of this statistical model, which was run through the software R is presented in § 6.2 and images extracted from the analysis are provided in Appendix II.

By applying these models to the dependent and independent variables of the current research, it was possible to calculate the significance of the correlation between prosodic, syntactic and pragmatic factors. Moreover, once the value of significance was established, the model also allowed the odds ratio to be calculated; this is another way to refer to the probability that a particular phenomenon will happen. This model was crucial for the statistical analysis carried out in chapter 6.

3.5 Challenges and unresolved issues

The methodological procedures followed in a study are crucial since the means by which the data is collected and annotated may profoundly affect the results. The greatest challenge of an experimenter is to avoid a scenario where the theoretical assumptions made at the beginning of a study might restrict the observation of data. An ongoing process of questioning improves the experiment by addressing the phenomena investigated through a more objective lens. In the current section, issues related to the first steps of the study and subsequent issues are highlighted.

As already anticipated, in studies on sign languages, one of the first challenges is to find a sufficient number of native signers, possibly with some linguistic awareness, available to collaborate with the researcher. This is not always a trivial issue, since, as stated before, the Deaf Community is relatively small. For the purpose of the current investigation, nine signers were willing to collaborate, however, in a future study, it

would be preferable for this number to be greater. This would allow the results to be validated through a more reliable sample of the population.

The way the collection of data is structured constitutes another important step. For the current study, the Monologues were established first, but very soon a problem arose owing to the excessively simple plots of the story, and therefore the task was improved by employing a more complex story. The important intuition[24] was to make the signers build a story together, as they do in silent novels. In this way, signers were invited to keep track of the referents introduced into the discourse, and the length of the story provided a test of how this information was managed and recalled across larger sentential distances.

In addition, dealing with spontaneous data leads to more complex annotation challenges, since naturalistic corpora display linguistic phenomena in a more disperse way. The annotation procedure needs to deal with typical conversational problems, such as sudden interruptions or suspensions of the discourse, corrections, or syntactical inconsistencies due to hesitation. These elements are reflected in the syntax, for example, in some cases the segmentation of sentences was a difficult task. In the ambiguous situations, a signer's judgment was a precious tool for smoothing out any confusion.

The statistical analyses also contributed to the increased level of complexity of the investigation, especially for a beginner student of statistics like the author. In this case, the help of Dr. Vadim Kimmelman was crucial for establishing the statistical model in the correct way, and this is why the plural form 'we' is used in the chapter about statistical analyses.

Other issues arose directly from the application of identification criteria to the topic items, especially in analyses concerning the notion of accessibility. During the annotation of the sentential distances and the number of entities that elapsed between a previous mention of a referent and its anaphoric reintroduction, the handling of collective nouns was very challenging. Indeed, linguistic forms expressing plurality semantically contain two or more referential recalls, which can have different distances and different numbers of competitors. In these cases, only the one with the greater distance and the larger number of competitors was taken into consideration, but, again, this is a methodological choice which may have had tangible effects on the results.

[24] Thanks to Prof. Francesca Panzeri of the University of Milan Bicocca for her feedback and suggestions on this methodological issue.

Other issues related to how prosodic, syntactic and pragmatic phenomena were handled in the investigation are further discussed in the final part of each of the following chapters (§ 4.5 for issues on prosodic aspects, § 5.5 for issues on the syntactic analysis of topics, § 6.3.3 for issues related to the study of referentiality).

3.6 Conclusions

The first part of this chapter expresses the research questions and advances the hypotheses and predictions related to the three addressed aspects of topicality, namely, prosodic features (chapter 4), syntactic properties (chapter 5) and pragmatic relationships (chapter 6).

Some key information about the Deaf Community has also been provided in order to better establish the context of the study and outline some important characteristics of the linguistic status of LIS in Italy.

The chapter has also provided methodological information and descriptions: firstly, the three types of data collected for this study were presented, and their strengths and weaknesses have been illustrated. Secondly, the differences and comparisons directly bound to the nature of these three types of data have been specified. Moreover, two more tests employed during the investigation, namely, grammaticality judgments and aboutness tests, have been discussed. The criteria for data annotation and subsequent improvements have also been singled out. Finally, the statistical tools that were crucial for the current study have been described and commented upon, with the aim of familiarising the reader with the results presented in the next three chapters.

CHAPTER 4.
Prosodic features of sentence topic types in LIS

4.1 Introduction

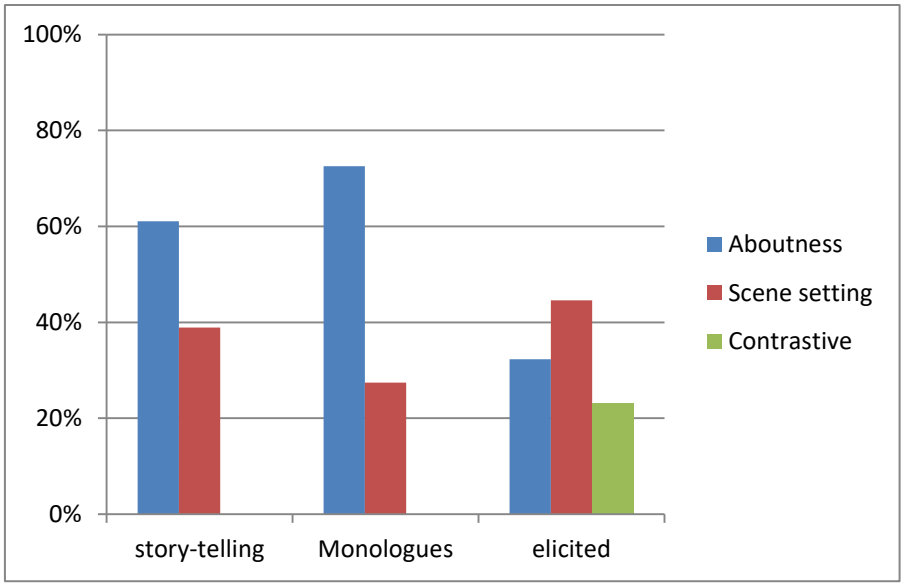
The data regarding sentence topics in LIS display interesting variations with respect to their combination with non-manual markers. Before addressing each type of topic in detail, a general overview of the proportions in which these topics are distributed across data types will be provided. If we consider the entire corpus of data, aboutness, scene-setting and contrastive topics account for 2,262 instances in total, which can be divided as follows: 1,742 aboutness topics, 458 scene-setting topics and 60 contrastive topics. The low number of instances of contrastive topics detected in the data means that the statistical analysis carried out for their prosodic contour is merely a preliminary investigation.

For the purposes of the current prosodic investigation, subject and object aboutness topics which were omitted across sentences (i.e. null arguments), have been eliminated from the corpus data. Since null arguments are excluded from the possibility of bearing any prosodic contour, their presence may have altered the results.
The table (8) and the chart (2) below present the percentages of the reduced data.

Table 8. Total instances of aboutness, scene-setting and contrastive topics in both spontaneous and elicited data.

Data	**Aboutness topics**	**Scene-setting topics**	**Contrastive topics**	**Total**
Story-telling	61% (430)	39% (274)	/	100% (704)
Monologues	73% (169)	27% (64)	/	100% (233)
Elicited data	33% (89)	45% (120)	22% (60)	100% (269)
Total	57% (688)	38% (458)	5% (60)	100% (1206)

Chart 2. Proportion of aboutness, scene-setting and contrastive topics in both spontaneous and elicited data.



In LIS, the topic types present in the three different sets of data are frequently accompanied by non-manual markings. However, 26% of the data is produced without non-manual markers. Of these instances, 28% are aboutness topics, 25% are scene-setting topics, while contrastive topics display only 6% of items not accompanied by non-manual markers. By focusing on the two types of spontaneous data, therefore excluding the elicited sentences, the overall proportions do not change especially: 31% are aboutness topics, and 28% are scene-setting topics. This means that aboutness and scene-setting topics in elicited sentences are more frequently combined with non-manual markers than in spontaneous data. If we consider the data that lacks co-occurring non-manuals in elicitation, the total instances decrease to 13% of the data (10% of aboutness topics, 18% of scene-setting topics and 6% of contrastive topics). Despite these variations, however, it is important to note that non-manual markers do not necessarily mark topics and non-manual markers alone cannot account for the existence of different topic types or topic projections.

The differences in the general proportions of aboutness, scene-setting and contrastive topics occurring in the total data or only in the spontaneous data are highlighted in the table (9) below:

Table 9. Comparison between the three different types of topic occurring in the whole corpus of data or in spontaneous data in isolation.[25]

Topic types	**All types of data (Story-telling,**	**Spontaneous data (Story-telling, and**

[25] Again, the percentages are calculated by eliminating aboutness topics annotated as null arguments.

	Monologues, and elicited data)	Monologues)
Aboutness	57% (688)	64% (599)
Scene-setting	38% (458)	36% (338)
Contrastive	5% (60)	/
Total	100% (1206)	100% (937)

As already anticipated in the methodological description, among the widespread number of non-manual markers, only a selected range was observed to appear in combination with topicality. A list of the detected non-manuals and their percentages of occurrence with respect to the total number of annotated topic items and to the topics found in spontaneous data is reported below.

Table 10. Types of non-manual markers occurring with respect to either the total quantity of data or only the spontaneous data.

Types of non-manual marker	Percentage of occurrence in the total quantity of data (1206)	Percentage of occurrence in the spontaneous data (937)
Squinted eyes	33%	35%
Raised eyebrows	28%	23%
Eye blink	29%	20%
Head nod	22%	16%
Chin down	12%	11%
Head tilt back	3%	4%
Lean rightward	1%	0%
Lean leftward	1%	0%

Despite the presence of isolated non-manual markers, some frequent combinations of markers arose from observing the data, such as the combination “raised eyebrows+squinted eyes” and the combination “squinted eyes+eye blink”. Their percentages are reported in the table below.

Table 11. Combination of non-manual markers with respect to the total quantity of data or the spontaneous data.

Combination of non-	Percentage of	Percentage of

manual marker	occurrence in the total number of data	occurrence in spontaneous data
Raised eyebrows-squinted eyes	9%	8%
Squinted eyes-eye blink	9%	7%

Indeed, as anticipated in the overview of previous studies on topicality in sign languages, there is a risk of drawing tautological conclusions on the prosodic and pragmatic functions of non-manual markers. In order to avoid this hazard, the following investigation has taken into consideration more linguistic aspects, including the prosodic, syntactic and pragmatic properties of topicality. The mere presence of non-manual markers was never assumed as a sufficient criterion for selecting a topic item.

In order to offer a systematic overview of the prosodic features related to the three topic types under analysis, the following section is divided into three subsections. The first one (§ 4.2) accounts for non-manual markers and prosodic boundary markers, which are realized in combination with aboutness topics in LIS. The second one (§ 4.3) addresses non-manuals and prosodic boundary markers accompanying scene-setting topics. Finally, § 4.4 considers a preliminary investigation of contrastive topic types in the current LIS data.

Some analyses carried out in the present chapter overlap with other linguistic spheres, such as syntax or pragmatics. Such overlaps are mentioned as part of this specific section and then further addressed in the corresponding chapters 5 and 6.

4.2 Prosodic markers of aboutness topics in LIS

The total number of aboutness topics in the entire amount of data is equal to 1,732. If we exclude the aboutness topics collected in the elicited data, the number decreases to 1,655. In fact, elicited sentences have been collected with a small number of signers and, for this reason, their results may display a lower degree of accuracy. In addition, elicitation seems to show greater internal variation in the use of non-manual markers with respect to spontaneous data and, as already pointed out in the methodology § 3.4.2, this could affect the findings. In order to keep the accuracy of the analyses high, only aboutness topics which have been collected in spontaneous data have been selected from the entire corpus of data. Furthermore, with the purpose of correctly addressing the prosodic functions of non-manual markers, only aboutness topic items which have been overtly realized are considered; their number is equal to 599. Those aboutness topics

which have been omitted as null arguments, as they lack the realization of a sign, did not demonstrate any possibility of being accompanied by a prosodic contour.

In this reduced data, 70% of aboutness topics are accompanied by non-manual markers; generally, two types of non-manuals accompany these topics: raised eyebrows (re) and squinted eyes (sq). 32% of aboutness topic items are accompanied by squinted eyes and 24% by raised eyebrows. Some variations do arise, however, depending on the type of data or the realizations of aboutness topics as DP or pronouns. The syntactic function of these types of topics, namely their being subjects or objects in case of aboutness and contrastive topics or temporal adverbs and locatives in case of scene-setting topics, also seems to play a role in the occurrence of one of these two markers. Further details about the prosodic contours accompanying aboutness topic items are provided in § 4.2.1.

In some cases, topics may be separated from the remaining part of the sentence by two prosodic markers: eye blink (eb) and head nod (hn). The marker of eye blink occurs in 20% of all analysed aboutness topics, while the marker of head nod arose in combination with aboutness topics in 16% of the cases. § 4.2.2 provides a more accurate analysis of the prosodic boundaries dividing aboutness topics from the remaining part of the sentence in LIS.

4.2.1 Manual and non-manual realizations in aboutness topics

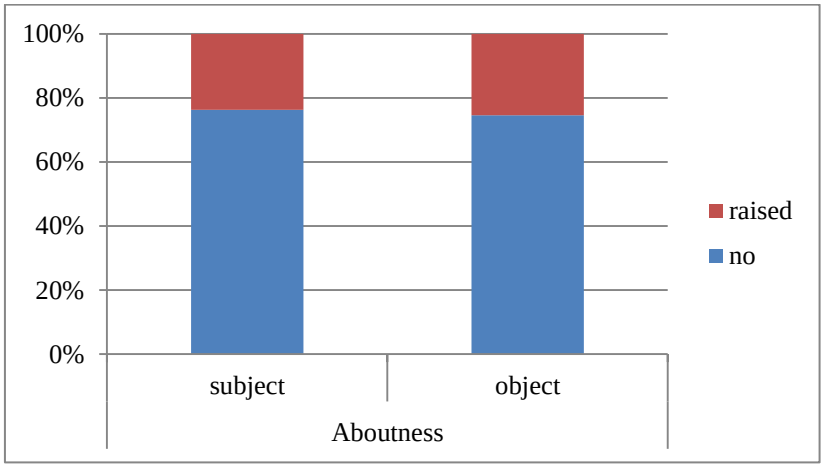
Findings show that, in LIS, the non-manuals raised eyebrows and squinted eyes are mostly involved in the production of aboutness topics. In particular, (i) the marker of raised eyebrows (re) accompanies aboutness topics in 24% of cases (143/599 items) and (ii) the marker of squinted eye (sq) accompanies the realization of aboutness topics in 32% of cases (193/599 items). If we consider the syntactic role of aboutness topics in the sentence, we find that raised eyebrows marks aboutness topic subjects (24%) and aboutness topic objects (25%) equally. The following table (12) and chart (3) display these results:

Table 12. Occurrence of the non-manual marker raised eyebrows with aboutness topics as subjects and objects.

Syntactic Roles	**Occurrence of the marker raised eyebrows**	**Non-occurrence of the marker raised eyebrows**	**Total**
Subject aboutness	24% (126)	76% (406)	100% (532)

topics			
Object aboutness topics	25% (17)	75% (50)	100% (67)
Grand Total	24% (143)	76% (456)	100% (599)

Chart 3. Non-manual marker raised eyebrows occurring with aboutness topics as subjects and objects.



Examples (140a)(140b) display the occurrence of raised eyebrows (re) with aboutness topic subjects, while examples (140c) and (140d) show an instance of aboutness topic object marked by raised eyebrows. The examples are followed by corresponding visual descriptions, which should be considered as indications of the main signs produced in the sentence.

(140)

re

(a) MAN BED SIT

'The man sits on the bed.' [Fi_st5_66]

Figure 46. ‘The man sits on the bed.’

re

(b) DAD MUM HAND-TAKE

‘The father takes the mother’s hand.’ [De_st1_28]

Figure 47. ‘The father takes the mother’s hand.’

re

(c) NEWSPAPER DOG_GRAB

‘The newspaper, the dog grabs it.’ [Ma_mo_12]

Figure 48. ‘The newspaper, the dog grabs it.’

re

(d) MONEY PUT_INSIDE

‘As for the money, (the man) puts it inside.’ [Fa_st10_43]

Figure 49. ‘As for the money, (the man) puts it inside.’

Topic subjects are always supposed to be moved into a specific topic position, however, sometimes this movement is not detectable since no syntactic differences arise in the structure. In other cases, topic subjects clearly occupy a different syntactic position or, more specifically, they have been considered as moved when they precede scene-setting topics. In instances where aboutness topics are realized as subjects that have been clearly moved from their original position, the occurrence of the marker of raised eyebrows was also detected. Specifically, this marker accompanies moved subjects in 21% of cases. The analysis of the data has proved that scene-setting topics are the first topic types to occur in the left periphery (see § 5.4 for further details about the syntactic hierarchy of topic types). (141) exemplifies an instance of moved subjects as aboutness topics marked by raised eyebrows:

re sq
(141) FAMILY TABLE SIT
‘The family sits down at the table.’ [La_5st_64]

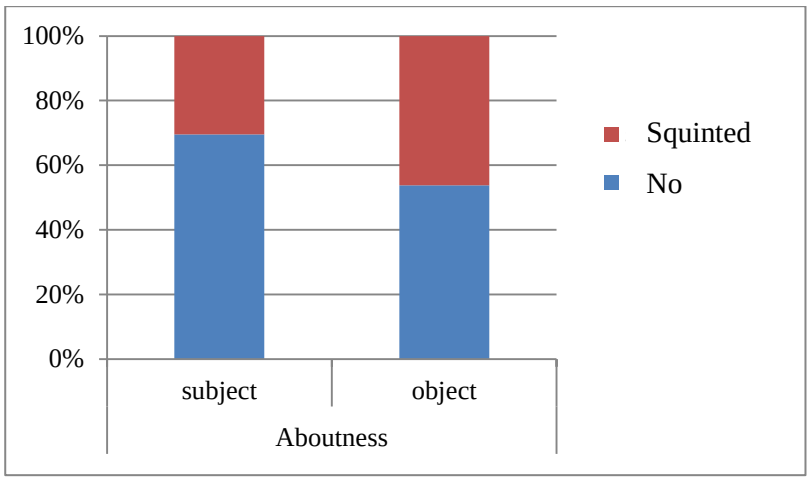
Figure 50. ‘The family sits down at the table.’

On the other hand, the marker of squinted eyes (sq) accompanies subjects in 30% of all instances of aboutness topic subjects, and objects in 46% of all instances of aboutness topic objects. Table (13) and Chart (4) summarise the findings presented above:

Table 13. Non-manual marker squinted eyes accompanying aboutness topic subjects and objects.

Syntactic Roles	Occurrence of the marker squinted eyes	Non-occurrence of the marker squinted eyes	Total
Subject aboutness topics	30% (162)	70% (370)	100% (532)
Object aboutness topics	46% (31)	54% (36)	100% (67)
Grand Total	32% (193)	68% (406)	100% (599)

Chart 4. Occurrence of the marker squinted eyes with aboutness topics realized as subjects and objects.



Some sentences exemplifying these data are provided below. Examples (142a) and (142b) display cases of subject aboutness topics, while examples (142c) and (142d) display object aboutness topics. All examples are followed by visuals.

(142)

sq

(a) DOG LITTLE CL:BITE

'The little dog bites (the bear).' [Ga_mo_51]

Figure 51. ‘The little dog bites (the bear).’

re sq

(b) LATER IX-3 MAN SAME HAT BOOK_OPEN

‘Later, the same man with the hat opens a book.’ [Na_st2_15]

Figure 52. ‘Later, the same man with the hat opens a book.’

sq

(c) NEWSPAPER GRAB

‘As for the newspaper, (the dog) grabs it.’ [De_st9_11]

Figure 53. ‘As for the newspaper, (the dog) grabs it.’

sq

(d) LEAF PE LEAF IX-3 BIRD CATCH

‘As for the leaf, the bird catches it’. [La_st7_60]

Figure 54. ‘As for the leaf, the bird catches it’.

In other cases, moved aboutness topic subjects are detectable since they occur in the left periphery of the sentence being marked by non-manuals, while a resumptive pronominal expression occupies the subject syntactic position with the function of recalling them, as the example (143) below illustrates.

Moreover, moved aboutness topic subjects that are accompanied by squinted eyes display a greater percentage of non-manual marking. Among the total number of moved subjects, 43% are realized in combination with the prosodic cue of squinted eyes, as in (143) and (144) below:

sq

(143) DAD IX-3 INSIDE WRITE

‘As for the dad, he writes inside the boat’. [Fa_st2_0]

Figure 55. ‘As for the dad, he writes inside the boat’.

re

(144) DOG LITTLE DOOR OPENING ENTER

‘The little dog enters through the doggy door’. [Ga_mo_36]

Figure 56. 'The little dog enters through the doggy door'.

Combinations of raised eyebrows and squinted eyes have also been found in the corpus in 4% of the total aboutness topic items. One of these cases is presented below.

re
sq

(145) PE DOG CHIWAWA HOUSE ENTER

'The chihuahua dog enters into the house'. [Ma_mo_28]

Figure 57. 'The chihuahua dog enters into the house'.

Interestingly, some of the referents accompanied by the marker of squinted eyes are not only bare nominal phrases, but more complex constituents conveying additional information about the nominal expression, such as genitives or restricted relatives. Pragmatically, it is likely that this information is conveyed in order to better specify the referent and to make its retrievability easier for the addressee.[26] Some of these uses are displayed in the examples below, accompanied by squinted eyes (sq) (146) and chin down (down) (147).

sq

(146) MAN WIFE POSS-3 PREPARE SUITCASE

[26] By explicitly asking a signer with a high linguistic awareness of his language about the use of squinted marking expressions, he confirmed that this marker is also employed in situations where an entity is considered part of the shared knowledge between the speaker and the interlocutor. While the current study only investigates previously mentioned referents when reintroduced into the discourse, the example provided by this signer includes referents that are first introduced into a discourse but are considered part of a shared, encyclopedic knowledge. As an example, he provided the following sentence:

squinted eyes

PASTA TYPE BARILLA $_y$, IX-1 LOVE IX-3$_y$

'As for the pasta Barilla (that you already know), I love it!'

‘The man’s wife prepares a suitcase’. [La_1st_18]

down

sq

(147) MAN$_1$ PE IX-2 WHITE TURBAN IX-3$_1$ SPEAK

‘The man you described with the white turban, he speaks’. [De_5st_0]

What has been considered so far leads us to delve deeper into the investigation of squinted eyes and to postulate that this type of marker is likely to bear a certain pragmatic function. Indeed, according to the compositional approach (Sandler 2005) previously addressed (§ 2.3.3), non-manual markers are linguistic elements that can create complex meanings when combined. Some previous studies (Engberg-Pedersen 1993, Dachkovsky 2005, Dachkovsky, Sandler 2009) associate the non-manual component of squinted eyes with the retrievability of constituents whose informational status is negotiated between the speaker and the interlocutor. Cross-linguistically, such markers seem to highlight mutually accessible information which is not currently prominent in discourse and has, therefore, been interpreted as a marker indicating the level of activation of shared knowledge. From this perspective, in LIS, the occurrence of squinted eyes also accompanies relative clauses, parentheticals, temporal clauses, conditional clauses and determiner phrases (Branchini 2014, Mantovan 2015) and may be considered a marker of presupposed information.

The present findings show that, from all aboutness topics extracted from the spontaneous data, those which are accompanied by squinted eyes mostly correspond to shifted topics (25%). The term shifted topics refers to entities which are reintroduced into the discourse after a previous mention. Depending on the distance between the previous mention and its reintroduction, and the presence of other entities which can function as competitors within this distance, shifted references may be considered less accessible from the speaker’s perspective. By contrast, continued topics, namely entities which remain consistent across adjacent sentences, are less commonly marked by squinted eyes (8%). Under the model we have proposed below, this could be explained by the fact that continued topics are already activated and salient in the hearer’s mind and therefore do not require any specific prosodic signal in order to be retrieved. The use of squinted eye marking both shifted and continued aboutness topics is summarized in Table (14) below:

Table 14. Grand total of the usage of squinted eyes with continued and shifted aboutness topics.

Aboutness Topics	**Squinted eyes**	**No squinted eyes**
Continued	8% (46/175)	22% (129/175)
Shifted	25% (147/424)	46% (277/424)
Total	32% (193/599)	68% (406/599)

Despite no straightforward correlation arising from the statistical analyses, it was proved that when the distance and number of competitors between an antecedent and its anaphoric referring expression is increased, the occurrence of squinted eyes increases.[27]

An interesting correlation arose between the syntactic categories of referential expressions and reintroduced contexts. This might be comprehensible if we consider the purpose of communicating successfully. A referent which is reintroduced into the discourse is more likely to be realized as a nominal expression, rather than encoded as a pronoun or a null argument. This finding is statistically significant (*estimated odd ratio* 3.86, $p<0.001$). For the sake of economy, many cross-linguistic studies about communicative exchanges in both modalities have proved that the more salient a referent is, the less linguistic material is needed for the speaker to codify it in order to make it clearly identifiable for the addressee (Givón 1983, Ariel 1988, Perniss & Özyürek 2014, Frederiksen & Mayberry 2016, Czubek 2017, Ahn 2019). Table (15) below shows the variation in such syntactic choices:

Table 15. Realization of shifted and continued aboutness topics as full DPs or pronouns.

Aboutness Topics	**DPs**	**Pro**
Continued	14% (81/175)	16% (94/175)
Shifted	48% (288/424)	23% (136/424)
Tot	62% (369/599)	38% (230/599)

Moreover, aboutness topic items realized in the form of nominal expressions are more frequently accompanied by the non-manual marker of squinted eyes (43%) than pronominal aboutness topics (14%). This asymmetry between full DPs and pronouns accompanied by squinted eyes is displayed and extensively discussed in § 6.2.1 and § 6.2.2, and the occurrence of squinted eyes with nominal expressions is statistically significant (*estimated odds ratio 7.55, $p<0.001$*). Moreover, the fact that a similar correlation is not displayed with other non-manual markers, such as raised eyebrows,

[27] For further details about referentiality and the pragmatic functions of non-manual markers, see § 6.6.2.

supports the retriever function played by the marker of squinted eyes. The table below reports the comparison between the usages of the two non-manual markers:

Table 16. Comparison of the prosodic markers of raised eyebrows and squinted eyes accompanying the realization of aboutness topics as DPs or as pronouns.[28]

Aboutness Topics	**Raised eyebrows**	**Squinted eyes**
DPs	26% (97/369)	43% (160/369)
Pronouns	20% (46/230)	14% (33/230)
Total	24% (143/599)	32% (193/599)

The disproportionate difference between the use of squinted eyes and raised eyebrows is the product of both phonological and pragmatic causes. The short phonological duration of pronominal expressions could reasonably represent difficulties in the complete realization and the clear alignment of prosodic markers with the pronominal item. From a more pragmatic perspective, if we conceive of certain non-manual markers, such as squinted eyes, as devices facilitating the retrievability of a constituent for the addressee, then pronominal items have a different informational status than that of nominal expressions. Pronouns are prototypically highly salient elements in the discourse (for other prototypical topics, see Brunetti 2009). Therefore, we can expect that they do not require the same prosodic signal in order to convey the pragmatic function of marking retrievability, as squinted eyes do in cases of nominal expressions.

Nonetheless, as well as this asymmetry, a specific prosodic marker seems to be employed predominantly in cases of pronominal aboutness topics. This marker consists of the head tilt back (htb) employed in 13% (30/230) of the total number of pronominal aboutness topics. Two example sentences are shown in (148) and (149) below:

htb

(148) IX-3 WALK

'He (the man) walks.'

[Fi_st3_12]

[28] The proportions are calculated by considering each percentage with respect to the total number of DPs and pronouns.

IX-3 WALK

Figure 58. ‘He (the man) walks.’

htb

(149) IX-3 POSTER_STICK

‘He (the man) sticks the poster.’ [De_st9_34]

IX-3 POSTER_STICK

Figure 59. ‘He (the man) sticks the poster.’

The marker of squinted eyes, (unlike other markers, such as eye blink) is a scalar marker, which means that it can be spread over the items with a different intensity. By observing the findings, it was also clear that the general intensity of squinted eyes may vary across the definite description increasing over the indices. According to Neidle et al. (2000), this prosodic use of non-manuals may support the correspondence between the head position of the modifier with respect to the nominal expression, which is placed in the specifier position. An example of this usage is reported below, however further analysis is required in order to better investigate the phenomenon. Variations in intensity are signalled by a stronger bold line.

sq

(150) MAN IX-3 GET_CLOSER

‘He (the man) gets closer (to the other man).’

[Fi_st7_35]

Figure 60. ‘He (the man) gets closer (to the other man).’

A final comment is due in order to provide an overview of the variation arising from the comparison of the two types of data (the spontaneous data composed by Monologues and Story-telling, and that from the elicited sentences). So far, only the spontaneous data has been considered, because, for the sake of accuracy, there is more of this data and it displays greater variation amongst signers. However, it is also important to provide a short account of aboutness topics produced through the elicited sentences. A total of 77 aboutness topic items were found in the elicited sentences. As anticipated in the introduction to this chapter, elicited sentences present a greater number of occurrences marked by a prosodic marker. This could be due to para-linguistic reasons, since they are produced in isolation in response to a previously provided context. This may affect the prosodic realization of signs.

The following table displays the percentage of aboutness topic items produced during the elicited sessions with respect to the two main non-manual markers employed: raised eyebrows and squinted eyes. No analysis can be carried out with respect to the proportion of nominal and pronominal expressions, since, in the case of elicited sentences, aboutness topics have always been produced as noun phrases.

Table 17. Raised eyebrows and squinted eyes marking aboutness topic subjects and objects extracted from the elicited sentences.

Aboutness Topics	**Raised eyebrows**	**Squinted eyes**
Subject	41% (19/46)	9% (4/46)
Object	70% (30/43)	63% (27/43)
Total	55% (49/89)	35% (31/89)

To sum up, aboutness topics as subjects and objects in LIS are mostly accompanied by two types of non-manual markers: raised eyebrows (which occur in 24% of the data) and squinted eyes (which arise in 32% of the data). In some cases, these markers can

occur in combination with one another (8%). The frequent overlapping between the marker of squinted eyes in cases of topic reintroduction (35%) leads to the hypothesis that such a marker also bears pragmatic functions, signalling the level of retrievability that the signer attributes to the reintroduced entity. Despite the lack of a straightforward statistical correlation between the use of squinted eyes and reintroduced contexts, the data presents an interesting chain of correlation. This consists firstly of significant interactions between aboutness topics (realized as nominal expressions) and the presence of squinted eyes (*estimated odds ratio 7.55, $p<0.001$*) and secondly a significant correlation between the occurrence of nominal expressions and reintroduced referents (*estimated odds ratio 3.86, $p<0.001$*). These two statistical interactions confirm a strong relationship between syntax and prosody, and syntax and pragmatic aspects.

Furthermore, a statistical test also confirms that the occurrence of the marker of squinted eyes increases when the distance between the antecedent and the anaphora, as well as the number of competitors in their distance, also increases. This discussion is further addressed in § 6.1. Aboutness topics that are realized in the form of pronominal expressions, instead, are less frequently accompanied by non-manual markers, except for the presence of the specific marker of head tilt back, which seems to spread with a statistical significance only in the case of pronominal forms (*estimated odds ratio 12.67, $p<0.01$*).

Finally, the data has been analysed depending on the way in which it was collected. Indeed, for purposes of accuracy, the previous analyses have been carried out by considering only spontaneous data. Elicitation sessions only involved a few signers. Analyses conducted on elicited data show a greater occurrence of prosodic markers, probably due to the peculiar conditions of the production of this type of data. Since these factors could have affected the general results, this type of data has not been used in the final analysis.

4.2.2 Prosodic boundary markers in aboutness topics in LIS

In LIS, prosodic markers such as eye blink (here repeated in Figure 61) and head nod (here repeated in Figure 62) generally mark the phonological utterance domain.

Figure 61. Eye blink

Figure 62. Head nod

However, these elements may also fulfil prosodic functions, by marking the boundaries of intonational phrases. In the current LIS data, the findings show that the marker of eye blink occurs as a boundary marker in 21% (124/599) of aboutness topics separating the aboutness topic phrase from the remaining part of the sentence. Eye blink separated 20% (110/532) of aboutness topics realized as subjects and 22% (15/67) as objects.

Examples of this usage are provided below, reporting the eye blink (eb) which separates the aboutness topic subject (IX-3 WIFE DAUGHTER) in the sentence (151) and the aboutness topic object (BIRD) in the sentence (152) below. Moreover, both of the sentences below display the presence of scene-setting topics of location. In the example (151), the signer's pointing provides the locative information(IX-loc), whereas in the example (152) the nominal phrase FOLDER provides the locative information.

		er		
		sq	sq	eb
(151)	IX-loc	IX-3 WIFE DAUGHTER		TABLE SIT

'There, the wife and the daughter were sitting at the table.'

[Fi_st5_60]

IX-3 WIFE DAUGHTER

TABLE SIT

Figure 63. ‘There, the wife and the daughter were sitting at the table.’

sq sq eb

(152) FOLDER, BIRD PUT_INSIDE

‘As for the bird, (he) puts inside it in the folder.’

[De_st11_09]

FOLDER BIRD PUT_INSIDE

Figure 64. ‘As for the bird, (he) puts it inside the folder.’

Beside the non-manual marker of eye blink, the marker of head nod was detected with the function of separating the topic phrase from the remaining part of the sentence. Aboutness topics are prosodically separated by head nod from the rest of the utterance in 16% (93/599) of all aboutness topics. In examining the syntactic roles of aboutness topics in the sentence, head nod is employed in 15% of aboutness topics as subjects (153), and in 19% of those cases where they carry out the syntactic role of objects (154).

hn

(153) IX-3 GO_INSIDE

‘He (the man) goes inside.’ [De_st5_04]

Figure 65. ‘He (the man) goes inside.’

hn

(154) IX-3 PICTURE IX-3 SASS:PICTURE IX-3 KID CHINESE HAIR SHORT PICTURE_GIVE

‘As for the picture, the Chinese kid with short hair gives it (to the man).’

[Mi_st6_36]

Figure 66. ‘As for the picture, the Chinese kid with short hair gives it (to the man).’

In 9% of cases, eye blink and head nod are combined together, marking the prosodic boundaries of aboutness topic items. Furthermore, the percentage of occurrences of both the prosodic markers of eye blink and head nod increases in cases where subjects are moved from their original position, or where objects which have been displaced in relation to the remaining part of the sentence, as displayed in the table (18) below:[29]

Table 18. Prosodic boundary markers occurring with moved and not-moved subjects and objects.

Aboutness topics	**Moved subjects**	**Not-moved subjects**	**Moved objects**	**Not-moved objects**
Presence of eye blink + head nod	17% (4/23)	9% (49/576)	12% (8/67)	8% (45/532)
Absence of eye blink				

[29] Percentages are calculated by considering the proportion within the whole number of moved subjects against not-moved subjects and moved objects against not-moved objects.

+ head nod	83% (19/23)	91% (527/576)	88% (59/67)	92% (487/532)

Consider the following sentences (155) and (156) below. The first case presents a subject (IX-3 CHILD IX-3 GIRL CHILD), which is addressable as a left-dislocated aboutness topic. In this situation, the presence of an overt pronominal resumption (IX-3_x) in the rest of the utterance at the right of the topic subject may attest to its dislocated syntactic nature, in line with the studies carried out in other sign languages and reported in § 2.3.2.1.2. The second example could be considered as a syntactic fronted complex object (PICTURE PE DAD MUM DAUGHTER PICTURE) which functions as an aboutness topic and which is separated from the null subject (he) and the remaining part of the sentence by the prosodic boundaries of eye blink and head nod.

down

sq eb+hn

(155) LATER IX-3 CHILD IX-3 GIRL $CHILD_x$ IX-3_x BED CL: LIE_DOWN WAKE_UP

'Later, the little girl, she who was lying in the bed woke up.'

[Fi_st1_29]

Figure 67. 'Later, the little girl, she who was lying in the bed woke up.'

sq hn+eb

(156) BED PICTURE PE DAUGHTER DAD MUM PICTURE CL: LOOK_AT

‘As for the picture with the daughter, the dad and the mum, (he) looked at it in the bed.’

[Na_st2_01]

Figure 68. ‘As for the picture with the daughter, the dad and the mum, (he) looked at it in the bed.’

Especially in the case of moved objects in combination with null subjects, the existence of a syntactic movement in the sentence is not always clear-cut, as already pointed out in existing literature on this phenomenon (Kimmelman 2014), which is addressed in § 2.3.2.1. A further test to verify the syntactic position of aboutness topics in LIS is conducted in § 5.3. In that case, attested syntactic movement is analysed and the prosodic cues employed confirm the use of eye blink and head nod as boundary marker signalling constituents, which have been displaced within the sentence.

When prosodic boundary markers are present, the data confirms the same asymmetry between nominal and pronominal aboutness topics. In other words, pronominal aboutness topics are not separated from the rest of the sentence by eye blink and head nod as often as nominal expressions are. Table (19) displays these findings:

Table 19. Prosodic boundary markers in aboutness topics that have been realized as DPs and pronouns.

Aboutness Topics	Eye blink	Head nod	Eye blink + Head nod
DPs	24% (93/369)	21% (79/369)	12% (45/369)

Pronouns	13% (31/230)	6% (14/230)	3% (8/230)
Total	21% (124/599)	16% (93/599)	9% (53/599)

A final note is required in order to address the different situation found in the elicited data. As in the other types of marker, such as raised eyebrows and squinted eyes, the occurrence of prosodic boundary markers also increases in the case of elicited sentences, as testified by the table (20) below. Again, extra-linguistic factors may have been responsible for the production of a greater number of prosodic strategies. In order to maintain the accuracy of the analysis this data has been considered seperately.

Table 20. Presence of eye blink, head nod and the combination eye blink + head nod occurring with determiner phrases in elicited sentences.

Aboutness Topics in elicited sentences	**Eye blink**	**Head nod**	**Eye blink + Head nod**
DPs	67% (60/89)	53% (47/89)	42% (37/89)

An example extracted from the elicited data is presented below. It displays a complex aboutness topic (RESEARCH MATH IX-3 PE IX-3) marked by chin down and squinted eyes and separated from the remaining part of the sentence by the prosodic boundary markers eye blink and head nod.

down

sq hn+eb

(157) RESEARCH MATH$_y$ IX-3 PE IX-3$_y$ IX-3$_x$ TODAY MARY$_x$ UNIVERSITY INSIDE DONE

'As for the research about mathematics, today, Mary did it inside the university.'

[Mi_elA_08]

Figure 69. ‘As for the research about mathematics, today, Mary did it inside the university.’

As seen before, aboutness topics can be divided from the remaining part of the sentence by the markers of eye blink and/or head nod. When produced together, the stronger occurrence of these markers with moved subjects or objects may enhance the hypothesis that prosodic boundary markers reflect the syntactic structure of constituents, signalling their displacement in the sentence. Finally, the variation between spontaneous and elicited data with respect to the frequency of non-manual markers co-occurring with aboutness topics adds a caveat based on data elicitation. Studies concentrating on pragmatic and prosodic phenomena are, in fact, very sensitive to the para-linguistic context and the way in which the data is collected. For further discussion about the methodological criteria employed in this study, see § 3.4.2.

4.3 Prosodic markers of scene-setting topics in LIS

The total number of scene-setting topics detected in all three types of data in LIS - Story-telling, Monologues and elicited sentences - consists of 458 items. 274 items are detected in Story-telling, 484 are found in Monologues and 120 have been annotated in the elicited sentences. By looking at the syntactic details of the total number of scene-setting topics, it is possible to divide them into expressions of time and location. Specifically, the entire corpus of data includes 287 items specifying a location, and 171 expressions of time. The table below summarizes the percentages of scene-setting topics of time and location according to the type of data.

Table 21. Occurrence of scene-setting topics of time and location with respect to the three different types of data.

Type of data	Scene-setting topics		Total
	Time	Locations	
Story-telling	35% (95)	65% (179)	100% (274)
Monologues	9% (6)	91% (58)	100% (64)
Elicited data	58% (70)	42% (50)	100% (120)
Total	37% (171)	63% (287)	100% (458)

The prosodic markers accompanying scene-setting topics in LIS are similar to those detected in aboutness topics, although their distribution varies. Like aboutness topics, scene-setting topic items are separated from the rest of the sentence by prosodic boundary markers. As for aboutness topics, elicited sentences have been excluded from the analysis and have been investigated separately. The elicited data displays a greater number of scene-setting topics. The contexts provided for collecting elicited data aimed at stimulating the production of scene-setting topics both as time and locative expressions within the same sentence. The presence of both types of scene-setting topics in the same sentence is, in fact, rare in spontaneous data. Elicited data is considered in the final part of each section, after spontaneous data. The elicited data has allowed a further analysis of the occurrence and distribution of scene-setting topics, which is addressed in detail in § 5. In order to avoid a less spontaneous use of non-manual markers, their analysis is based only on data coming from Story-telling and Monologues. § 4.3.1 provides detailed information about the main non-manual markers accompanying the realization of scene-setting topics. § 4.3.2 provides information and examples on the use of prosodic boundary markers occurring with scene-setting topic items.

4.3.1 Manual and non-manual realizations in scene-setting topics

In spontaneous data, scene-setting topics are accompanied by the same types of non-manual markers which also spread over aboutness topics, including raised eyebrows and squinted eyes. However, as anticipated in the previous section, their distribution is different. An overall analysis of both scene-setting topics of location and time shows that the marker of raised eyebrows spreads over scene-setting topics in 21% of the items, while the marker of squinted eyes accompanies scene-setting topics in 39% of cases. Other markers have been detected, such as the presence of chin up, which amounts to 16% of both scene-setting topics of time and location, and the presence of

chin down, which amounts to 9% of scene-setting topics of both time and location. As for other prosodic signals, their presence is negligible, for example, head tilt back only arises in 2% of the scene-setting items. The table below summarizes these findings, by analysing each marker with respect to its presence/absence among scene-setting topics.

Table 22. Presence and absence of the markers of raised eyebrows, squinted eyes, chin up and chin down, head tilt back with respect to scene-setting topics.

Type of non-manual marker	**Presence of the marker in scene-setting topics**	**Absence of the marker in scene-setting topics**	**Total**
Raised eyebrows	21% (71)	79% (267)	100% (338)
Squinted eyes	39% (133)	61% (205)	100% (338)
Chin up	16% (54)	84% (284)	100% (338)
Chin down	9% (29)	91% (309)	100% (338)
Head tilt back	2% (6)	98% (332)	100% (338)

The absence of the marker head tilt back in cases of scene-setting topics may be explained by considering that this marker almost exclusively accompanies pronominal aboutness topics in LIS, as already shown in § 4.2.1. Therefore, the lack of this prosodic cue in scene-setting topics is expected.

If we focus on squinted eyes and raised eyebrows, we can sketch a more detailed scenario. Squinted eyes and raised eyebrows mostly spread over scene-setting topics of location, respectively, squinted eyes is found in 46% and raised eyebrows in 22% of locative items. This distribution indicates that scene-setting topic items expressing temporal information are less frequently combined with these prosodic markers. As a matter of fact, squinted eyes accompany time scene-setting topics in 30% of the cases and raised eyebrows in 18% of the occurrences. Table (23) below summarises the findings extracted from the spontaneous data discussed above:

Table 23. Non-manual markers raised eyebrows and squinted eyes in scene-setting topics of time and location.

Scene- setting topics	**Raised eyebrows**	**Squinted eyes**
Time	18% (18/101)	30% (30/101)
Location	22% (53/237)	43% (103/237)
Tot	21% (97/338)	39% (133/338)

Examples (158a) and (158b) show the use of raised eyebrows (re) with a scene-setting topic of location (HOUSE) and time (BEFORE). Examples (159a), (159b) and (159c) show the use of squinted eyes with scene-setting topics of location (CABIN) (HOUSE INSIDE) and a scene-setting topic of time (LATER).

(158)

re

(a) **HOUSE** IX-3 PE ROOM SLEEP

'In the house, he (the man) slept inside a room.'

[La_st7_34]

Figure 70. 'In the house, he (the man) slept inside a room.'

re

sq re eb

(b) IX-3 **BEFORE** LOOK-AT

'He (the man), before, was looking at him (the other man).'

[Fa_st4_55]

Figure 71. 'He (the man), before, was looking at him (the other man).'

(159)

down

sq eb+hn

(a) **CABIN** MAN INSIDE ENTER

‘In the cabin, the man enters inside.’

[Mi_st4_03]

Figure 72. ‘In the cabin, the man enters inside.’

sq hn

(b) **HOUSE INSIDE** SASS: ROUND HAT CL:BE_AT

‘Inside the house, the hat was hanging.’

[De_st1_05]

Figure 73. ‘Inside the house, the hat was hanging.’

sq

(c) **BEFORE** FLOWER CL:TAKE

‘Before, (he) takes the flower.’

[Na_st6_114]

Figure 74. ‘Before, (he) takes the flower.’

Although rare (only 9% of occurrences in the entire corpus of data), these two non-manual markers may appear together in the same sentence marking scene-setting topics. They mostly occur with scene-setting topics of location (10% of all locative scene-

setting topics), and even less frequently with scene-setting topics of time (6%), as displayed in the examples (160a) and (160b) below.

(160)

er

sq

(a) **IX(loc)** SEE CLEARLY PICTURE

'There, you see clearly a picture.' [De_st1_23]

IX(loc) SEE CLEARLY PICTURE

Figure 75. 'There, you see clearly a picture.'

er

sq

(b) **LATER** CL:PICTURE_ZOOM

'Later, the picture is getting bigger.'

[Mi_6st_60]

LATER CL:PICTURE_ZOOM

Figure 76. 'Later, the picture is getting bigger.'

To sum up, in spontaneous data, both scene-setting topics of time and location are accompanied by two main prosodic cues, namely, the markers of raised eyebrows and squinted eyes. A more detailed observation of the percentages arising from the data confirms a prominent combination of these two non-manual markers with scene-setting topic of location to the detriment of scene-setting topics of time.

By looking at elicited data, however, the intonation contours of some markers is visibly more pronounced. For example, the percentage of the marker of raised eyebrows is

almost doubled in the elicited sentences, produced in 40% of the total number of occurrences. By contrast, the marker of squinted eyes arose with a slightly reduced frequency (22% of the total scene-setting topics are marked by squinted eyes). Except for a more relevant use of chin down in cases of scene-setting topics of locations (34%) the presence of the other markers is similarly negligible.

The table (24) below summarizes the comparison of the findings about scene-setting topics of time and of location extracted from elicited and spontaneous data, namely, the combination of Story-telling and Monologues.

Table 24. Comparison of scene-setting topics of time and location occurring in spontaneous and elicited data and marked by raised eyebrows and squinted eyes.

Type of non-manual marker	**Presence of the marker in scene-setting topics in spontaneous data**		**Total**	**Presence of the marker in scene-setting topics in elicited sentences**		**Total**
	Time	Locations		Time	Locations	
Raised eyebrows	18%	22%	21% (133/338)	43%	36%	40% (48/120)
Squinted eyes	30%	43%	39% (71/338)	10%	38%	22% (26/120)
Chin up	20%	14%	16% (54/338)	9%	/	5% (6/120)
Chin down	3%	11%	9% (29/338)	3%	34%	16% (19/120)
Head tilt back	3%	1%	2% (6/338)	/	/	0%

Despite this gradient use of non-manuals, the intonational tendencies detected do not change, at least in the types of non-manuals employed. Raised eyebrows and squinted eyes remain the two most common prosodic markers which spread over scene-setting topics. While temporal scene-setting topics are marked by raised eyebrows, scene-setting topics of location display a greater occurrence of non-manual markers.

Examples of scene-setting topics accompanied by raised eyebrows and squinted eyes are presented below. In (161a) a scene-setting topic of time is marked by raised eyebrows and in (161b) a scene-setting topic of location marked by raised eyebrows is shown. (162a) and (162b) display cases of scene-setting topics of time and location

respectively marked by squinted eyes. Every example is combined with the corresponding visuals.

(161)

re sq

(a) **TODAY** FISH FRESH MAN BUY SUDDENLY

'Today, the man suddenly bought fresh fish.'

[Na_elA_01]

Figure 77. TODAY

re

re sq

(b) TODAY **CINEMA** $MOVIE_a$ $IX\text{-}3_a$ MARY SEE

'Today, at the cinema, Mary saw a movie.'

[Ma_elB_10]

Figure 78. CINEMA

(162)

sq

(a) YESTERDAY **GARDEN** CAT JOHN DOG $POSS_3$ GROWL

'Yesterday in the garden John's dog growled at the cat.

[Mi_elB_06]

Figure 79. GARDEN

sq sq

(b) **TODAY** PARK JOHN DOG BRING_OUT

'Today, in the park John brings out the dog.'

[Ma_elA_04]

Figure 80. TODAY

Cases of combination of the marker of raised eyebrows and squinted eyes have also been detected, although admittedly in a very small percentage: 8% of scene-setting topics of location and 3% of scene-setting topics of time. An example of a locative scene-setting topic marked by both non-manuals is displayed below:

re

sq

(163) TOMORROW **CENTRE ESTATE AGENCY** JOHN HOUSE BUY

'Tomorrow, at the real estate agency, John will buy a house'.

[Ma_elA_02]

Figure 81. ESTATE AGENCY

We can therefore conclude that, in the same way as aboutness topics, elicited sentences present a different proportion of non-manual markers. Although the following results have to be validated by further research with a greater amount of elicited data, a preliminary comparison allows us to postulate that non-spontaneous contexts trigger a more pronounced use of prosody, especially in the case of raised eyebrows. The following section addressees the use of prosodic boundary markers by investigating their occurrence and behaviour with scene-setting topics.

4.3.2 Prosodic boundary markers in scene-setting topics

Prosodic boundary markers in LIS frequently occur after a scene-setting topic item with the function of separating it from the remaining part of the utterance. In the case of more than one scene-setting topic expression, prosodic boundary markers can also occur, either separating the two expressions, or at the end of the scene-setting topic domain. Among the spontaneous data, the marker of eye blink occurs in 20% (69/338) of the examples involving scene-setting topics, while the marker of head nod occurs in 17% of the total number of scene-setting topics (338). By focusing on scene-setting topic items, eye blink separated 20% of temporal expressions identified as scene-setting topics and 21% of the scene-setting topic of location. In contrast, the split between temporal and locative expressions accompanied by the marker of head nod is greater. In fact, it separates 21% of the scene-setting topics of location and only 7% of the scene-setting topics of time. Table (25) below shows the occurrences of both these prosodic boundary markers:

Table 25. Prosodic boundary markers in scene-setting topics.

Scene-setting topics	**Eye blink**	**Head nod**
Time	19% (20/101)	7% (7/101)
Location	21% (49/237)	21% (49/237)
Total	20% (69/338)	17% (56/338)

Sentences (164-166) below, exemplify the occurence of these prosodic boundary markers in the data. Specifically, example (164) displays eye blink produced after the scene-setting topic of time and location, while examples (165) and (166) display head nod marking the boundaries of the scene-setting topic of time and location. Pictures are shown in order to demonstrate the production of the relevant markers.

eb eb

(164) LATER IMAGE IX_{3pl} DAD MUM BOTH_OF_THEM SIT

'Later, in the picture, the father and the mother are both sitting together.'

[Fi_1st_23]

LATER PICTURE DAD MUM

BOTH_OF_THEM SIT

Figure 82. 'Later, in the picture, the father and the mother are both sitting together.'

hn

(165) THEN THE_FOUR_OF_THEM EAT TOGETHER

'Suddenly, some months later, (he) receives a letter and looks at it.'

[Mi_st8_61]

THEN THE_FOUR_OF_THEM EAT TOGETHER

Figure 83. 'Suddenly, some months later, (he) receives a letter and looks at it.'

hn

(166) WALL THERE-IS SASS:PICTURE_SQUARED

'On the wall, there is a squared picture.'

[La_st7_48]

Figure 84. ‘On the wall, there is a squared picture.’

In some rare cases (9%, 31/338), eye blink and head nod may also be found together separating a topic constituent from the remaining part of the sentence. They are produced in 4% (27/237) of temporal scene-setting topics and in 11% (4/101) of locative scene-setting topics. The examples below exemplify these possibilities:

eb+hn

(167) SUDDENLY MONTH LATER CL:LETTER_TAKE / CL:LOOK_AT

‘Suddenly, some months later, (he) receives a letter and looks at it.’

[Fa_st10_54-55]

Figure 85. ‘Suddenly, some months later, (he) receives a letter and looks at it.’

eb+hn

(168) CITY AREA BE STATUES TWO

‘In the city area, there are two statues.’

[Mi_2st_31]

Figure 86. ‘In the city area, there are two statues.’

By comparing these analyses with the elicited data, it is possible to confirm the previously mentioned scenario which also holds true for the other prosodic markers. Indeed, the occurrence of such boundary markers separating scene-setting topics is amplified in the case of the elicited data. The proportions are doubled with respect to the spontaneous data, and the cases of co-occurrence of eye blink and head nod as a percentage are four times higher than that found in the spontaneous data. Such results are displayed in the table (26) below:

Table 26. Comparison between eye blink and head nod occurring with scene-setting topics of time and location in spontaneous and elicited data.

Type of non-manual marker	**Presence of the marker in scene-setting topics in spontaneous data**		**Tot**	**Presence of the marker in scene-setting topics in elicited sentences**		**Tot**
	Time	Locations		Time	Locations	
Eye blink	19%	21%	20% (69/338)	50%	60%	54% (65/120)
Head Nod	7%	21%	17% (56/338)	37%	48%	42% (50/120)
Eye blink-head nod	4%	11%	9% (31/338)	33%	36%	34% (41/120)

Representative examples of elicited sentences showing eye blink and head nod as boundary markers are reported below in (169) and (170):

(169) TODAY, FEMALE STUDENT, INSIDE UNIVERSITY CALL MUM
re eb+hn eb eb

'Today, the female student, inside the university, calls her mum.

[Na_elA_07]

(170) YESTERDAY, RESTAURANT INSIDE, PIZZA IX-3 MARY EAT DONE […]
re eb+hn

'Yesterday, at the restaurant, Mary ate the pizza'.

[Mi_elC_08]

Interestingly, when more than one scene-setting topic occurs in a single sentence, prosodic restructuring effects may appear: the scene-setting topics form a single intonational phrase. This means that only the most internal boundary between the rightmost scene-setting topic and the rest of the sentence is marked, while, in contrast, the boundaries between the scene-setting topic types are left unmarked. This is shown in (171), in which the scene-setting topic of time (TODAY) and the scene-setting topic of location (PARK) are combined into a single prosodic phrase. In this exemplary situation, the combination of both prosodic markers (eye blink + head nod) only appears to mark the rightmost scene-setting topic (PARK).

	er		er	
	sq	eb+hn	sq	
(171)	TODAY, PARK,		$JOHN_i$ DOG $POSS_i$	CAT GROWL

'Today, in the park, John's dog growls at the cat'.

[Ma_elA_06]

Figure 87. 'Today, in the park, John's dog growls at the cat'.

Such prosodic uses might confirm the hypothesis advanced by Benincà and Poletto (2004) regarding the existence of broader topic fields composed of similar topic types. In this case, the scene-setting topics of time and location are merged into a single prosodic block before the aboutness topic, mirroring the syntactic structure. This discussion is further addressed in § 5, when the syntactic position of topic types is considered in detail.

In conclusion, scene-setting topic types are more frequently accompanied by both the prosodic markers of squinted eyes and raised eyebrows than aboutness topics. Moreover, scene-setting topics are more prominently separated from the remaining part of the sentence than aboutness topic items. By comparing the different types of data, elicited sentences present a greater percentage of non-manual markers than that found in spontaneous data, despite the similarity of the markers employed. These results seem to confirm the proposal advanced by some scholars for both signed and spoken languages (Benincà & Poletto 2004 for spoken Italian, Jacobs 2001, Kimmelman 2014 for NGT and RSL) of the existence of different topic fields, such as scene-setting topics and aboutness topics, sharing common prosodic and semantic features.

In the next section, an overview of the prosodic features accompanying contrastive topics in LIS is provided.

4.4. A first insight into the prosodic markers of contrastive topics in LIS

Unlike aboutness topics and scene-setting topics, contrastive topics in LIS have been exclusively elicited through specific contexts. No occurrences of contrastive topic items have been detected in the spontaneous data. As already pointed out in the literature (§ 2.2.1.3, § 2.2.3.3, § 2.3.1.3 and § 2.3.3.2.3) and in the methodology (§ 3.4), contrastive functions can be found both with topic and focus items. However, given the semantic nature of contrast (Krifka 2008, Navarrete in prep.), only parallel contrast can be analysed as a contrastive topic construction. Therefore, in line with these analyses, only topic items expressing parallel contrast are taken into account and considered in this preliminary study.

The corpus of contrastive data collected from elicited sentences consists of 60 items. Contrastive topics present a more homegeneous scenario for the use of non-manual markers. Indeed, almost all contrastive topic items (93%, 56/60) were accompanied by non-manuals. In line with other studies on contrastivity in sign languages (Sze, 2008, Kimmelman 2014, Navarrete, in prep.), in LIS contrast is marked by specific prosodic and syntactic strategies. Regarding prosodic cues, one of the most frequent non-manual markers is the left and right movement of the body through space, even though other non-manuals did arise, such as the use of raised eyebrows and squinted eyes. Syntactically, the use of the rightmost versus the leftmost portion of the signing space or the backward versus the forward part of it is a common way in which signers encode contrastivity among entities.

The following sections present a more specific account of the prosodic realization of contrastive topics in LIS (§ 4.4.1) and provide some observations about the use of eye blink and head nod in cases of contrastive topic items (§ 4.4.2).

4.4.1 Manual and non-manual realization in contrastive topics

As specified in the section above and in the methodology (§ 3.4), the elicitation task was established in order to trigger the realization of topic expressions related to each other by parallel contrast. This means that neither correction nor selection should have been triggered as a function of contrast, otherwise contrast would have overlapped with the focus domain. All three signers who took part in the elicitation task were asked to answer a question about two different entities which had already been introduced into the discourse. Moreover, the elicitation task aimed to study both subject and object items expressing parallel contrastivity. Subject items were produced in 30 sentences and object items in another 30. In so doing, it was possible to preliminarily explore how contrastivity is prosodically codified with respect to different syntactic functions. Examples of subject contrastive topic items and object contrastive topic items are provided below in (172a) and (172b):

(172)

(a) Context: What do John and Mary think about the dog?

	eb+hn	eb		eb	
	er		body-right		body-left
DOG_a	IX-3_a	$JOHN_{3b}$	$LOVE_a$	$MARY_c$	$HATE_b$

'As for the dog, John loves him while Mary hates him.'

[Mi_elC_01]

(b) Context: Yesterday, at the restaurant, what did Mary do with the pizza and the cauliflower?

			eb+hn			eb+hn	
			re			body-right	
YESTERDAY	RESTAURANT	INSIDE		PIZZA	IX-3_a	$MARY_b$	EAT DONE

eb+hn	
body-left	
IX-3	$CAULIFLOWER_c$ IX-3 IMPOSSIBLE

'Yesterday, at the restaurant, Mary ate the pizza, but she left the cauliflower.'

[Mi_elC_08]

With regards to the realization of contrastive topics, these show a widespread variety of non-manual markers, but the displacement of the body leans to the left and right arose as a specific signal of contrast. Table (27) below displays the percentage of non-manual markers occurring with contrastive topics found in the elicited data:

Table 27. Non-manual markers accompanying contrastive topic items as subjects and as objects in elicited data.

Type of non-manual marker	**Presence of the marker in contrastive topics in elicited data**		**Total number of data**
	Subject	Objects	
Raised eyebrows	43% (13/30)	63% (19/30)	53% (32/60)
Squinted eyes	17% (5/30)	27% (8/30)	22% (13/60)
Lean-head right	30% (9/30)	10% (3/30)	20% (12/60)
Lean-head left	30% (9/30)	17% (5/30)	23% (14/60)
Head forward	2% (1/30)	2% (1/30)	4% (2/60)

Some sentences exemplifying the use of prosodic non-manuals are provided below. Specifically, (173) displays a case of raised eyebrows and squinted eyes marking contrastive topic objects, while (174) and (175) display a case of body displacement marking subjects and objects in contrastive topics. Example (176) shows a unique case of forward and backward head/body lean marking the contrastive topic items:

(173) Context: What does John think about the theatre and the cinema?

eb+hn eb+hn eb+hn
sq
er re
THEATRE JOHN HATE IN_CONTRAST CINEMA LOVE
'John hates the theatre, while he loves the cinema.'
[Na_elC_10]

Figure 88. ‘John hates the theatre, while he loves the cinema.’

(174) Context: What do John and Mary think about the cat?

eb+hn		eb+hn		eb	
	body-right			body-left	
re	re			re	
sq				sq	
CAT_a	G-I-A-N-N-I_b	$LOVE_a$	IN_CONTRAST	$MARY_c$	$HATE_c$

‘As for the cat, John loves him, in contrast Mary hates him.’

[Ma_elC_03]

Figure 89. ‘As for the cat, John loves him, in contrast Mary hates him.’

(175) Context: Yesterday, at the restaurant, what has John done with the pizza and the fish?

		eb	hn		eb		
		re		body-right		body-left	
YESTERDAY	RESTAURANT INSIDE	$JOHN_a$	$FISH_b$	EAT	DONE	$PIZZA_c$	EAT NEG_O

‘Yesterday, at the restaurant, John ate the fish and left the pizza.’

[Mi_elC_07]

Figure 90. ‘Yesterday, at the restaurant, John ate the fish and left the pizza.’

(176) Context: What does Mary think about the pizza and the fish?

hn	hn		eb
er	body-forward		body-backward
$MARY_a$	$PIZZA_b$	$LOVE_b$	$FISH_c$ HATE

‘Mary loves the pizza and hates the fish.’

[Ma_elC_06]

Figure 91. ‘Mary loves the pizza and hates the fish.’

As shown in the examples (174) and (175) above, some contrastive items can be marked by the sideward movement of the body to the right and left. Such movements in other SLs (see Kimmelman 2014 for NGT and RSL, Navarrete in prep. for LSC, and Wilbur 2012 for ASL) have been detected for every type of contrast involving the contrastive relationship between two or more different entities (§ 2.3.3.2.3). Moreover, these body movements often spread over the verb of the contrasted sentence in which the contrastive item is contained. Interestingly, in those cases where body displacement was not spatially displayed, a manual sign indicating the contrast (IN_CONTRAST) was produced, and this action highlighted the parallel opposition. Some examples have been provided above. One of them (173) is repeated here for clarity in (177):

(177) Context: What does John think about the theatre and the cinema?

eb+hn	eb+hn	eb+hn
sq		

er re

THEATRE JOHN HATE IN_CONTRAST CINEMA LOVE

'John hates the theatre, while he loves the cinema.'

[Na_elC_10]

Figure 92. 'John hates the theatre, while he loves the cinema.'

In the case of contrastive topic objects, the contrastive constituents may be fronted and occupy a clearly different syntactic position, i.e., between the scene-setting topic and the preverbal subject, as displayed in the example (178) below:

(178) Context: Yesterday, what did John do with his mum and his dad?

eb+hn hn eb+hn eb+hn eb+hn

sq sq

re

YESTERDAY MUM JOHN CALL ANSWER

eb eb+hn

sq

re

IX-3 DAD CALL ANSWER IMPOSSIBLE

'Yesterday, John called his mum and received an answer, while he called his dad but it was impossible to contact him.' [Ma_elC_09]

It is reasonable to assume that a similar movement may also appear in the case of subject contrastive topics. However, the movement of contrastive topic subjects is harder to detect, since no elements can be used to trace back the moved position, except for the use of scene-setting topics. Unfortunately, only a restricted number of contrastive topic subjects have been found to occur before scene-setting items. Further analysis is required to better understand cases of contrastive topic subjects displaced in the structure.

In line with the purpose of the current study, the issue of the existence of an independent category of contrast that is combined with topicality is not addressed. However, the analysis of prosodic data suggests that two non-manual markers are widespread across all three types of topics (aboutness, scene-setting and contrastive topics), and consist of the markers raised eyebrows and squinted eyes. These unitary occurrences of this intonational contour lead us to postulate the possibility of a pragmatic function conveyed by the presence of these two prosodic markers which may arise in isolation or in combination, marking the sentential information that is considered as presupposed by the signer. On the basis of this prosodic function, other markers with specific pragmatic roles may overlap, as in the case of the left and right displacements of the body, which seem to signal contrastive parallel functions, or head tilt back, which only spreads over pronominal referents.

The small amount of elicited data collected in this study limits the analysis of contrastive markers to a preliminary stage, however, an initial insight seems to indicate that prosodic markers spread over the presupposed information and mark topicality, on top of which other non-manual markers with a contrastive function can be layered thanks to the visual-gestural nature of SLs. The following section addresses the presence and use of prosodic boundaries, separating contrastive topic items from the remaining proposition.

4.4.2 Prosodic boundary markers in contrastive topics

Contrastive topic constituents are very frequently separated from the remaining part of the sentence by eye blink (47%) and head nod (40%). Combinations of both eye blink and head nod have also been detected in the data in 27% of cases, as shown in Table (28) below:

Table 28. Prosodic boundary markers in contrastive topics.

Contrastive topics	**Subject**	**Object**	**Total**
Eye blink	58% (12/30)	48% (16/30)	47% (28/60)
Head nod	29% (8/30)	48% (16/30)	40% (24/60)
Eye blink + head nod	16% (5/30)	32% (11/30)	27% (16/60)

As displayed in the table above, the marker of eye blink prominently accompanies contrastive topic subjects (58%), although contrastive topics realized as objects are also

often marked by this non-manual strategy. On the other hand, the marker of head nod seems to display a preference when occurring with contrastive topic objects (48) at the expense of contrastive topic subjects, which are less commonly accompanied by this marker (29%).

Examples of these tendencies are reported below. Specifically, Example (172a), repeated here in (179), displays a case of eye blink occurring as a marker with the function of separating the two contrastive topic subjects (JOHN) (MARY) from the remaining proposition. Example (180), instead, displays a case of head nod separating a contrastive topic object (FISH). Moreover, in Example (174), repeated here as (181), the combination of eye blink and head nod separates subject contrastive items (JOHN and MARY) from the verb.

(179) Context: What do John and Mary think about the dog?

	eb+hn	eb		eb	
	er		body-right		body-left
DOG_a	IX-3_a	$JOHN_{3b}$	$LOVE_a$	$MARY_c$	$HATE_b$

'As for the dog, John loves him while Mary hates him.'

[Mi_elC_01]

(180) Context: Yesterday, at the restaurant, what did John do with the pizza and the fish?

	eb+hn	eb+hn	hn				
	re	sq	sq				re
YESTERDAY	RESTAURANT	$FISH_b$	$JOHN_a$	EAT	DONE	IN_CONTRAST	$PIZZA_c$ LEAVE

'Yesterday, at the restaurant, John ate the fish and left the pizza.'

[Na_elC_07]

(181) Context: What do Mary and John think about the cat?

	eb+hn	eb+hn		eb		
		body-right		body-left		
	re	re		re		
	sq			sq		
CAT_a	G-I-A-N-N-I_b	$LOVE_a$	IN_CONTRAST	$MARY_c$	$HATE_c$	

'As for the cat, John loves him, in contrast Mary hates him.'

[Ma_elC_03]

A small difference in the use of prosodic boundary markers was detected with respect to their spread over the first or second contrastive constituent. As displayed in the table (29) below, there is a small preference for the prosodic marker of eye blink to mark the

second contrastive item in a contrastive sentence, while such tendencies are not detected in the case of head nod. By contrast, the presence of the combined marker of eye blink + head nod predominantly arises after the first constituent. Such tendencies may lead us to postulate that the first contrastive constituent is prosodically more strongly separated from the remaining part of the proposition than the second constituent, as displayed in the table below:

Table 29. Comparison between the first and second topic contrastive constituent with respect to the occurrence of prosodic boundary markers.

Contrastive topics	**Only eye blink**	**Only head nod**	**Eye blink + head nod**
First constituent	7% (2/30)	13% (4/30)	33% (10/30)
Second constituent	30% (9/30)	10% (3/30)	20% (6/30)
Total	18% (11/60)	12% (7/60)	27% (16/60)

However, given the small number of contrastive items collected, the current analysis is only an introductory study. Further investigation is required in order to better understand the phenomenon.

4.5 Challenges and unresolved issues

The prosodic investigation of topic types was not a trivial task. Analytic criteria for the annotation of data differ depending on the definition of topicality. Therefore, the selection process was intrinsically bound to the theoretical assumption made in the initial part of the study. It can be argued that although theories are required for any type of analysis, at the same time they also reduce the possibility of a broader and freer investigation. Furthermore, the annotation of spontaneous data increases difficulties in analysis, since spontaneous dialogues present constructions which are more complex to analyse, issues such as the identification of sentence boundaries, or of constructions in which the predicate is repeated twice. In order to confront such issues and avoid mistakes in the selection process, the annotated sentences have been randomly submitted to a native signer, who is an LIS expert, for verification. This has allowed a more accurate analysis of the data, and has provided interesting insights for setting the analytic procedure. Regarding the specific analysis of aboutness and scene-setting topics, one issue at stake is the problematic identification of some items with locative values realized as DP, which could be ambiguously interpreted as either aboutness or

scene-setting topics in the sentence. In the same vein, similar cases were collected and submitted to the judgment of a signer with advanced skills in linguistics. Depending on the situation, they were either annotated as locatives or, in cases of persistent ambiguity, excluded from the corpus.

Leaving aside the methodological and annotation challenges, other issues were related to the syntactic properties of sentences containing null arguments. For example, null arguments may occur with explicitly mentioned objects which are produced in the initial part of the sentence. In these cases, it was difficult to distinguish objects used as aboutness topics from those situations where the aboutness topic was in fact the null argument. Simply put, the null argument was considered as an aboutness topic in the majority of cases, except for some contexts where the introduction of the sentence initial object was particularly prominent from a pragmatic point of view, and was also prominent in the following sentence. The linguistic context was always taken into consideration as a litmus test for validating doubtful cases.

The pragmatic identification of aboutness topics was mainly based on pragmatic properties, such as the necessary existence of a previous first introduction of the analysed entity into the discourse, and the requirement that the subsequent proposition stated something new about that entity. Of course, these criteria limited the selection of information considered by the signer to be presupposed or shared with her/his addressee on the basis of certain encyclopedic knowledge. However, these reductions were necessary for remaining within a comfort zone, and avoiding the selection of entities that would otherwise have been completely unidentifiable. Unfortunately, similarly defined criteria could not be applied to the selection of scene-setting topics, since their informational status is theoretically either new or given. Indeed, this information sets the ground on which the following proposition holds and, for the purpose of frame setting, a previous mention of temporal or spatial directions is not necessary because these elements are by default assumed to be shared. This lack of a precise pragmatic identification of a scene-setting topic increases the difficulties in recognizing these elements from bare locative indications. Either the syntactic position of this information or the presence of boundary markers have aided the distinction, however, as already stated in the methodology (§ 3.4.3) prosodic cues have never been taken as unique requirements for identifying topics, in order to avoid any tautological identification.

As for contrastive topics, the small quantity of data means that this analysis is only a preliminary investigation. In addition, overlapping between aboutness and contrastive topics is not completely excluded, despite the fact that, in this investigation, the two elements have usually been annotated separately in order to avoid any confusion.

Finally, the fact that contrastive topics were only collected through elicited sentences weakened the analysis with respect to the other topic types that have also been studied in the spontaneous data.

Future research should therefore increase the quantity of data and seek to find contrastive occurrences of topic types in more spontaneous contexts in order to validate or invalidate the observations made in the present study.

4.6. Conclusions

The innovation of undertaking a prosodic analysis regarding the existence of different topic types in LIS has required a cautious approach in both selecting and annotating the data. Nevertheless, the opportunity to compare more than one type of data allowed for more reliable results. Indeed, the prosodic tendencies detected in the elicited sentences confirmed those found in the spontaneous data, despite a small difference in the proportion of uses of non-manual markers.

In answer to the research question (RQ) 4.1 about the prosodic contour which accompanies the three topic types, it is possible to state that although no direct relationship between form and function was detected in the data, two main prosodic tendencies - raised eyebrows and squinted eyes - prominently mark aboutness and scene-setting topics, showing internal variation in their occurrences. Aboutness topics are accompanied in 32% of cases by squinted eyes and in 24% of cases by raised eyebrows. Other markers have been detected in the data, such as the presence of chin down and head forward, but these accompany aboutness topics in a negligible quantity. As expected, the analyses concerning the pragmatic use of the prosodic marker of squinted eyes show that this marker appears most often in aboutness topics realized as nominal expressions. Pronominal aboutness topic elements are not significantly accompanied by non-manual markers, except for the presence of head tilt back, a marker that only spreads over pronouns. This answers the research question 4.1.2, concerning the variation of prosodic markers with respect to the syntactic roles or the syntactic categories of topic types. Moreover, depending on the syntactic role of aboutness topics realized as subjects or objects, the occurrence of non-manual markers may vary. It seems that objects are more frequently accompanied by squinted eyes, while no significant difference was detected in the case of raised eyebrows.

The answer to the research question 4.1.3, concerning the pragmatic role of some non-manual markers, is that the analysis of the shifted and continued types of aboutness

topic items across sentences has highlighted a significant correlation between nominal aboutness topics and reintroducing contexts. Therefore, it is possible to suppose a specific role for the syntactic category of nominal expressions that encodes both prosodic and pragmatic information. In this case, although no significant correlation was found between the occurrences of squinted eyes with shifted transitions, it seems that this marker conveys a pragmatic function related to the retrievability of introduced entities. In this investigation, due to the nature of aboutness topics, no previously introduced referents have been considered. However, there are some cases in which even newly-introduced referents are assumed already to be shared between the signer and the interlocutor. A clear example of this situation comes from the following expression, takenfrom the corpus and displayed in (182) below:

(182) KNOW AS BREAD
'Do you know, something like bread'.

[Fi_07_20]

This and other similar occurrences, along with the explicit confirmation of a linguistically trained signer, have led us to consider such markers in LIS as linked to the degree of retrievability of information. This discussion is addressed in further detail in § 6.

Despite the presence of squinted eyes and raised eyebrows in both aboutness and scene-setting topics, the latter are more frequently accompanied by these non-manual markers. This is particularly true with respect to the locative expressions establishing the setting in which the sentence takes place. Scene-setting topics of location are accompanied in 22% of cases by the marker of raised eyebrows and in 43% by the marker of squinted eyes. In contrast, temporal information is less commonly marked by prosodic signals (18% with raised eyebrows and 30% with squinted eyes). The fact that both aboutness and scene-setting topics are accompanied by the same types of prosodic contour, despite them having a different percentage, may lead us to consider these topics as pragmatically related to a macro-category of presupposed information.

Beside the prosodic markers spreading over aboutness and scene-setting topic expressions, other types of prosodic cue have been produced to separate the topic constituents from the remaining part of the sentence, namely, eye blink and head nod. These markers, which have also been detected in other SLs (see §2.2.3), frequently accompany all topic constituents in LIS, although the percentage differs depending on the topic type. In answer to the research question 4.1.1 about boundary markers, in line with the results it is possible to claim that aboutness and scene-setting topics are

intonationally separated from the rest of the sentence by a similar number of prosodic boundaries. Aboutness topics are separated by the non-manual marker of eye blink in 21% of cases and by head nod in 16%, while scene-setting topics use this marker in 20% and 17% of cases respectively. These markers – eye blink and head nod - may arise in isolation or in combination, depending on how firmly the constituent is separated from the rest of the sentence from a prosodic point of view. However, if we look at the percentage calculated for elicited sentences, the proportion increases. Eye blink separates aboutness topics from the rest of the sentence in 67% of cases in elicited sentences, while head nod does so in 53% of cases. Scene-setting topics are separated from the rest of the sentence by eye blink in 54% of cases and in 42% by head nod in elicited sentences.

Finally, a preliminary account of contrastive topics is provided, since only items elicited from three native signers have been considered. The paucity of participants necessitates further investigation and validation, although some general tendencies have been detected. In particular, the two main non-manual markers, raised eyebrows and squinted eyes, which spread over aboutness and scene-setting topic items optionally, also spread over contrastive topics. Their presence confirms the function that both non-manuals carry out as markers of presupposed information. Contrastive topics display the presence of another non-manual: the rightward versus leftward displacement of body lean. This marker can optionally occur with contrastive topics, overlapping with the other two non-manuals and probably adding a contrastive function. When the contrastive prosodic contour is missing, the manual sign glossed IN_CONTRAST is produced, compensating for the absence of the prosodic contrastive non-manuals, i.e. the rightward and leftward body leans. It is thus possible to suppose the existence of isolated prosodic markers that, when combined, may fulfil several pragmatic roles, such as marking presupposed or shared information, or addressing opposition among constituents.

Although further research is needed to investigate the prosodic cues activated in this domain in LIS, this study represents a first step towards an understanding of topicality, and contributes to shedding some light on the complex prosodic, syntactic and pragmatic aspects of this phenomenon. The next section addresses the syntactic properties of the three different topics investigated.

CHAPTER 5.
Syntactic properties of sentence topics in LIS

5.1 Introduction

The following chapter focuses on the syntactic aspects of the previously analysed topic types. Specifically, the next section (§ 5.2) provides an overview of the syntactic constructions used for encoding the aboutness topics found in the LIS data, with a particular focus on their realization as subjects, left dislocation and hanging topic constructions. The third section (§ 5.3) provides a preliminary hypothesis regarding the syntactic nature of left-dislocated aboutness topics, through the strong islands test. The fourth section (§ 5.4) addresses the syntactic distribution of aboutness, scene-setting and contrastive topics in LIS, in order to better account for the syntactic modifications allowed under topicality conditions. Finally, the last sections (§ 5.5) discuss the challenges and unresolved issues arising from this type of investigation and (§ 5.6) draw some conclusions.

5.2 Syntactic types of sentence topics

As previously introduced in § 2.3.2.1, aboutness topics have been identified in the LIS corpus because of their pragmatic features. From a syntactic point of view, however, these elements can be codified through different constructions. Within the spontaneous data, four main types of linguistic structure have been detected as aboutness topic expressions: subjects of the sentence which express an entity about which the proposition adds new information (§ 5.2.1); subject or object left-dislocated constructions (§ 5.2.2); and hanging topic expressions (§ 5.2.3). As for this latter typology, further research is required in order to validate the results, since hanging topic constructions did not arise frequently in the data. As for scene-setting topics and temporal and locative expressions, these topics have been identified either as simple adverbs or determiner phrases, and as more complex constructions such as propositions expressing time or place information (§ 5.2.4). Examples of these categories are reported below.

5.2.1 Subjects as aboutness topics in LIS

Aboutness topics found in spontaneous data are mostly realized as subjects expressing the entity about which the remaining part of the proposition establishes something new,

regardless of their syntactic categorization as determiner phrases (DP), pronouns or null arguments. In cases of their overt realization, especially as determiner phrases, aboutness topics are accompanied by prosodic markers, such as raised eyebrows (re) and squinted eyes (sq), as discussed in the previous chapter (§ 4.2). However, aboutness topics can also be realized without non-manual markers and this leads us to suppose that their intonational contour is not categorical, but optional. Two examples of aboutness topics accompanied by non-manual markers employed with topicality are provided in (183) and (184) below. Examples (185) and (186) show the lack of non-manual markers over aboutness topic subjects.

eb+hn
re
sq sq

(183) **DOG LITTLE** DOGGIE_DOOR CL:GO_INSIDE
'The little dog walks through the doggie door.'

[Ga_mo_36]

Figure 93. 'The little dog walks through the doggie door.'

re
sq

(184) **LATER IX-3 BEAR** CL:LOOK_AT
'Later, the bear looks at (the dog).'

[Ma_mo_14]

Figure 94. ‘Later, the bear looks at (the dog).’

(185) **DOG LITTLE** WAKE UP
‘The little dog wakes up.’

[Ga_mo_89]

Figure 95. ‘The little dog wakes up.’

(186) **IX-3 DAD** CL:SIT
‘The dad takes a seat (on the train).’

[De_st1_51]

Figure 96. ‘The dad takes a seat (on the train).’

In line with previous research carried out on SLs (Kimmelman 2014, Kimmelman & Pfau 2016), it is possible to hypothesise that marked topic subjects are syntactically placed in a different structural position, and this is the reason why specific prosodic contours which are linked to topicality accompany these items. However, in the case of unmarked topic subjects, their syntactic position is difficult to demonstrate, as it coincides with the unmarked position of subjects in LIS, namely, the sentence-initial position. The situation changes in scene-setting topics. These elements, which generally precede the subject, can signal the movement of the aboutness topic item. This is displayed in the example below where the nominal aboutness topic IX-3 MAN is placed between the two scene-setting topics of location HOUSE and ROOM. This mediating position can be considered to demonstrate the syntactical movement of the aboutness

topic. Indeed, in the standard distribution, as we will see in § 5.4, the aboutness topic follows the scene-setting topic of location.

The pictures displayed below and in the remaining examples intend also to provide a visual overview of the sentence, by singling out the main signs of the glosses.

	re		sq		
(187)	HOUSE	**PE MAN**	ROOM	SLEEP	

'In the house, the man sleeps in a room'.

[La_st7_34]

Figure 97. 'In the house, the man sleeps in a room.'

In other cases, the aboutness topic has been produced as a pronominal expression, encoding the entity about which the proposition adds some new information. Pronominal expressions used as aboutness topics, as already seen in § 4.2 and § 6.2.2, are less frequently accompanied by non-manual markers, except for the presence of a head tilt back (htb). For the purposes of the current investigation, only strong pronominal forms have been selected. In fact, since clitic pronominal forms are much harder to identify, at this stage of the study, the consideration of strong pronouns only was preferable. Two examples of sentences displaying a strong pronoun marked as an aboutness topic (in bold) are reported below:

	htb	
(188)	**IX-3**$_a$	HAPPY

'He (the bear) is happy'.

[Mi_mo_92]

Figure 98. ‘He (the bear) is happy’.

re

(189) **IX-3**$_a$ BE_SCARED IX-3$_b$[30]

‘He (the bear) is scared by him (the dog)’.

[Ro_mo_64]

IX-3 BE_SCARED IX-3

Figure 99. ‘He (the bear) is scared by him (the dog)’.

Syntactically speaking, the sentential contexts in which aboutness topic expressions are salient in the discourse license their omission, as in the example (190) displayed below, where the aboutness topic in the coordinated sentence is omitted, since it was previously mentioned in the sentence before.

re eb

(190) **MAN** BED CL:LAY_DOWN $_{42}$/ **Ø** PICTURE SEE $_{43}$/

‘The man lies on the bed and he looks at the picture’.

[La_st7_42-43]

These strategies represent the most common way in which aboutness topic expressions are encoded in the signers’ production. However, other syntactic constructions, such as left-dislocated constituents or hanging topics, have been produced, and were most probably triggered by particular communicative purposes or discourse-related needs.
In the next section, left-dislocated structures with the syntactic role of subject and object are presented.

5.2.2 Subjects and objects as left-dislocated aboutness topics in LIS

Since the early studies on SLs (Aarons 1994, Sze 2011, Kimmelman 2014), topic items left adjoined to the left periphery of the clause were considered to be left-dislocated structures. A subject or object in sentence-initial position is reported to optionally co-

[30] The pronominal expressions refers to the dog, as displayed in the picture under the translated sentence.

refer with a pronominal element inside the clause. Such descriptions adhere to the syntactic construction of left-dislocated structures.

Left-dislocated topic constructions have been detected in the LIS data co-occuring with the displacement of subjects and objects. In some cases, the overt presence of a resumptive pronoun which syntactically takes the role of the displaced item in the main clause provides validation for such an interpretation. In place of the pronominal resumptive element, the repetition of the nominal phrase can also be used as a resumptive strategy, as displayed in (191) below:

re hn

(191) **MAN CL PE** IX-3 MAN SLEEP

'The man, he, the man sleeps'.

[Mi_st6_03]

Figure 100. 'The man, he, the man sleeps'.

Several examples of left-dislocated subjects resumed by pronominal expressions found in the spontaneous corpus are presented in (191-193). Interestingly, the pronominal function of the resumptive element can be confirmed by the fact that similar pronouns are left outside the scope of the prosodic contour accompanying the dislocated element, as in the example (192), where the dislocated topic item is accompanied by raised eyebrow (re), but not the following resumptive pronoun.

re

(192) **IX-3 WIFE** IX-3 PREPARE

'The wife, she prepares herself.'

[Mi_st8_58]

Figure 101. ‘The wife, she prepares herself.’

sq
re

(193) **IX-3 ANIMAL** IX-3 CL:TAKE HAT
‘The animal, he takes the hat.’

[Mi_st12_08]

Figure 102. ‘The animal, he takes the hat.’

In some cases, the dislocated elements may also consist of more complex nominal expressions, containing, for example, a relative clause, as in (194) and (195), or a parenthetical structure, as in (196) below:

eb+hn
sq
re

(194) **MAN OLD IX-3 HAT SASS:POINTY PE** IX-3 THINK WORK TOGETHER IX-3
‘The old man who wears the pointy hat, he works together (with the other man), I think.’

[La_st7_01]

Figure 103. ‘The old man who wears the pointy hat, he works together (with the other man), I think.’

eb+hn

re sq

(195) **IX-3 MAN PE** **HAT** DETACH_SHEET

‘The man who wears the hat, he detaches a sheet’.

[Mi_st8_72]

Figure 104. ‘The man who wears the hat, he detaches a sheet’.

eb+hn

sq

(196) LATER **IX-3 CHILD IX-3 FEMALE CHILD** IX-3 BED LIE_DOWN, Ø WAKE UP

‘Later, the child, namely the little girl, she was lying in the bed, and woke up.’

[Fi_st1_29]

Figure 105. 'Later, the child, namely the little girl, she was lying in the bad, and woke up.'

Moreover, although rarer than subject left dislocation, cases of object left dislocation may also be found in the corpus. In this case, a referential strategy, such as the classifier which refers to the leaf, may fulfil the syntactic function of the dislocated constituent, bearing the syntactic role of the object, as displayed in the example (142d) repeated below as (197):

		sq	eb+hn
(197)	d.h.	**LEAF PE LEAF IX-3**	BIRD CATCH
	n.d.h.		CL: LEAF

'As for the leaf, the bird catches it'.

[La_st7_60]

Figure 106. 'As for the leaf, the bird catches it'.

According to some studies (Aarons 1994), syntactic dislocated structures might also be licensed in case of the postulated presence of an empty category (the so-called little *pro*)

which could bear the case and the typical features of an overt resumptive pronoun, as reported in the example (198) below. In this case, it is possible to hypothesise the left dislocation of the subject for several reasons: (i) the scope of the non-manual marker of squinted eyes only accompanies the left-dislocated subject, (ii) the presence of an eye blink functioning as a prosodic boundary with the remaining part of the sentence and (iii) the position of the temporal adverb NOW, which could be considered as a scene-setting topic. Indeed, in non-dislocated structures, the scene-setting topic generally precedes the position of the aboutness topic (as further explained in § 5.4). The fact that in the example the scene-setting topic follows the aboutness topic, together with the other mentioned cues, allows us to suppose that the aboutness topic is placed in a dislocated position.

	eb	eb
	sq	

(198) **DOG KIND_OF DOG** NOW *pro* CL:WALK

'The dog, I mean that kind of dog, now, he walks'.

[Na_st8_30]

Figure 107. 'The dog, I mean that kind of dog, now, he walks'.

In light of these analysed constructions, it is possible to conclude that LIS also displays cases of dislocated topic structures which hold true for both subject and object constituents.

5.2.3 Hanging topics as aboutness topics in LIS

As previously mentioned in the literature on SLs (§2.3.2.1), hanging topics are identified with clause-external topic constituents that are placed sentence-initially. Moreover, hanging topics are not syntactically related to the main verb, but these types of topic create semantic or pragmatic relationships either with the subject of the sentence, or with the whole proposition. Given the very small number of hanging topic occurrences in the data, however, a more detailed investigation would be required in order to analyse the phenomenon further. The following results and discussion should

therefore be taken as a preliminary step toward a syntactic account of these constructions in LIS. An example of a hanging topic which can be considered an aboutness topic is reported below:

sq

(199) ANIMAL EXAMPLE BIRD IX(loc) NEG

'As for the animal, for example, the bird was not there.'

[Mi_st4_18]

Figure 108. 'As for the animal, for example, the bird was not there.'

Despite these expressions pragmatically fitting the function of an aboutness topic for the sentence, cases like this have not been included in the linguistic analyses. Indeed, since these analyses require a clear distinction of the syntactic role of the aboutness topic as either subject or object of the main clause, further consideration of these rare structures, which are neither subjects nor objects, would have altered the results. In fact, these types of element are related to the clause only through semantic relationships. In the case presented above, the relationship is one of hypernymy and hyponymy, since the name ANIMAL is the hypernym of BIRD and BIRD is the hyponym of ANIMAL.

5.1.4 Time and locative expressions as scene-setting topics in LIS

From a syntactic point of view, scene-setting topic items can appear in several forms, either as simple time adverbs, as locative phrases, or as more complex expressions, such as temporal or locative propositions. For the purposes of the current investigation, both simple and complex forms found in relation to a main clause have been considered. Examples of simple time and locative expressions, which were also the most frequent structures detected in the data, are presented in (200-203) and reported here with highlights in bold for clarity:

sq

(200) **BEFORE** FLOWER CL:TAKE

‘Before, (he) takes the flower.’

[Na_st6_114]

Figure 109. ‘Before, (he) takes the flower.’

eb+hn

(201) **SUDDENLY MONTH LATER** CL:LETTER_TAKE / CL:LOOK_AT

‘Suddenly, some months later, (he) receives a letter and looks at it.’

[Fa_st10_54-55]

Figure 110. ‘Suddenly, some months later, (he) receives a letter and looks at it.’

re

(202) **HOUSE** IX-3 PE ROOM SLEEP

‘In the house, he (the man) slept inside a room.’

[La_st7_34]

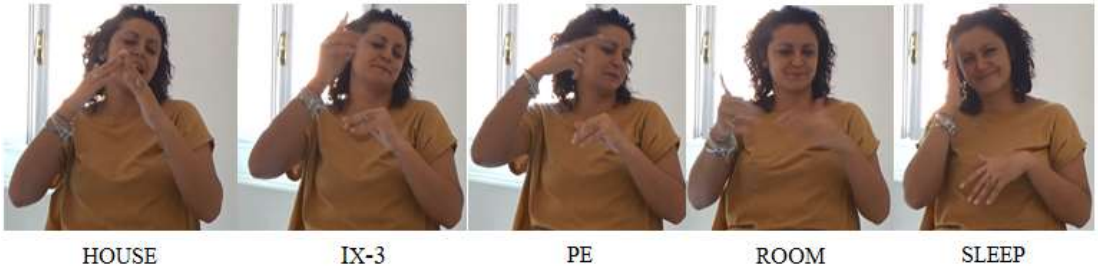


Figure 111. ‘In the house, he (the man) slept inside a room.

down

sq eb+hn

(203) **CABIN** MAN INSIDE ENTER

'In the cabin, the man enters inside.'

[Mi_st4_03]

Figure 112. 'In the cabin, the man enters inside.'

An example of a more complex temporal structure fulfilling the same scene-setting function is reported below in (204).

eb+hn

re

sq

(204) **ONE_YEAR DONE,** IX-3 SNOUT ANIMAL IX-3 SEE

'One year later, you see the animal with his snout.'

[De_st11_27-28]

Figure 113. 'One year later, you see the animal with his snout.'

5.3 Base-generated or moved aboutness topics in LIS

In this section, the moved or base-generated status of aboutness topics is verified through a diagnostic tool traditionally employed to detect syntactic movement: strong islands. Islands are domains able to make a relationship of dependency ungrammatical, or at least less acceptable (Ross, 1986). This is in line with the principle of subjacency (Chomsky 1973, 1977), according to which syntactic boundary-nodes, such as clause boundaries or nominal phrase boundaries, exist and cannot be simultaneously crossed by wh-expressions or moved items (see § 1.2 for further details).

In the literature, scholars have detected two types of island. The first type is a weak island, which licenses the extraction of some phrases without yielding to an ungrammatical sentence; the second type is a strong island, which does not allow any type of extraction. These structures are however accepted as grammatical, in those cases where constituents are resumed by appropriate pronouns. Strong islands are, therefore, able to determine the moved or unmoved nature of some types of topic. When the topicalized item does not lead to an ungrammatical sentence, we may suppose that the topic is neither moved nor extracted from the inner part of the sentence. Instead, it may be considered to be base-generated in a dedicated position.

As previously mentioned in § 2.3.2, (according to Branchini 2006, Donati & Branchini 2009, Branchini 2014), LIS relative clauses are said to be generated as the internal argument of the matrix clause and then raised to the left periphery of the structure. Relative clauses, as we have seen, may land in a position dedicated to presupposed information, i.e. a topic position. Indeed, these structures share the same prosodic markers as topic elements: squinted eyes and raised eyebrows. Certain studies (Branchini 2014, Brunelli 2011) have supported this hypothesis, claiming that lower topic positions may be occupied by a relative clause, if a syntactic movement occurs.

In order to better understand the syntactic nature of the topics appearing in the higher left periphery of the structure, a test triggering strong islands was developed and presented to a native signer with a high metalinguistic competence (see § 3.4.2.5). For the purposes of this preliminary experiment, 10 sentences were proposed to the native signer, who had to judge their grammaticality and eventually reproduce them. As already described in the methodology, the test was conducted in LIS, in order to avoid any influence from spoken language. All the proposed sentences were judged as grammatical, and some examples are provided below (205-209), however it seems that not all of them have then been realized with the same structure.

An example of some sentences extracted from the corpus is provided here and commented on below.

(205) Context: *The homework given by the English teacher is boring and the children never want to do it. Therefore, yesterday the teacher has changed his methodology hoping to better stimulate the students. Do you know what he did with respect to the homework?*

sq re eb+hn

$HOMEWORK_i$ $CHILD_x$ DONE PE_x $PROFESSOR_j$ AWARD $_jGIVE_x$

a: 'As for the homework, the professor gave an award to the children who had done it'.

b: 'As for the children who have done the homework, the professor gave them an award'.

Figure 114. 'As for the homework, the professor gave an award to the children who had done it'.

The linguistic element PE, as attested in previous studies (Cecchetto et al. 2006), is analysed as a demonstrative-like element with the function of linking the CP of the relative clause to the matrix CP. A different proposal (Branchini 2006; Branchini e Donati 2009; Branchini 2014) suggests PE to be a determiner originating next to the NP head univocally identifying it. PE endows the relative clause with nominal features, moving to the head position of the relative CP and turning it into a DP.

The linguistic determiner PE is placed in a syntactic position higher than Negation, Aspect and Modality. In this position, the element can project its categorical determiner status over the entire clause with the effect of nominalizing it. In cases of restrictive relative clauses in LIS, such as those analysed in §2.3.1.1, PE marks the boundary of the clause.

In the structure above, and in other structures like it, PE marks the boundary of the restrictive relative clause ('the children who have done the homework').
In another example, PE fulfils the role of a resumptive clitic pronoun, since it belongs to the matrix clause identifying the person who has prepared the cake, as indicated by co-indexation in the glosses.

(206) Context: *The cake for your sister's birthday is ready, but I do not know if someone has paid the pastry chef. Do you know if someone has paid for it?*

re eb++

$CAKE_i$ $PERSON_j$ $PREPARE_i$ PE_j MUM PAY_j

a: 'As for the cake, mum has paid the person who has prepared it'.

b: 'As for the person who prepared the cake, mum has paid him/her'.

Figure 115. 'As for the cake, mum has paid the person who has prepared it'.

By looking at how the two sentences above were produced, it is possible to suppose the existence of two different translations: in the first case (a), the object occupies a position outside the relative clause. As previously seen in § 3.4.2.5, no extractions from complex NP - such as the relative clause are grammatical, therefore, it is reasonable to suppose

that this is a case of left dislocation in which the topic aboutness object is base-generated in the leftward periphery of the sentence. In the second case (translation b), the object is scrambled inside the relative clause, but it still occupies a position within the relative clause.

In order to clarify the correct interpretation, other linguistic signals, such as the occurrence of non-manual boundary markers, are required, which may attest the presence of syntactic boundaries, or of clearer prosodic contours, which could lead to enhance the hypothesis of a left-dislocated topic.

In the examples (207) and (208) reported below, the sentences offer a clearer demonstration that the interpretation of a left-dislocated topic object can be sound. In these cases, in fact, the position of the object is clearly divided by an eye blink and a head nod which signal a prosodic break. Therefore, the interpretation of the object as base-generated in the leftmost position of the structure is supported by the function of the prosodic pause arising between the object and the relative structure, which might reflect the presence of a syntactic boundary.

In the two sentences below (207) and (208), the aboutness topics CAT and MOVIE are similarly separated from the remaining part of the sentence by the prosodic boundaries eye blink and head nod and by a change in the non-manual markers. These elements, indeed, seem to enhance the existence of a base-generated object in the extreme leftward periphery of the sentence, occupying a higher position with respect to the relative clause.

(207) Context: There is an alley cat in the street, noone has ever seen it, but many people are looking for it. Do you know someone who has seen it?

re eb+ re eb

CAT$_x$ IX-3$_x$ YESTERDAY CHILD$_i$ PE$_i$ SEE DONE IX-1 IX-3$_i$ KNOW

'As for the cat, I know a child who saw him yesterday'.

(208) Context: The audience did not enjoy the movie. Have you met someone who has seen it?

re eb+hn re eb

MOVIE$_i$ IX-3$_i$ FRIEND$_x$ SEE$_i$ DONE PE$_x$ IX-1 TOMORROW WE MEET

'As for the movie, today we met a friend who has seen it'.

Five sentences out of ten point toward the same possible interpretation, displaying the presence of prosodic boundary markers placed between the object and the relative clause.

By looking at the type of aboutness topics placed in the higher topic position, it is possible to suppose that these topics are base-generated outside the relative clause and correspond to cases of left-dislocated (LD) topics. This hypothesis is also confirmed by the presence of the same prosodic contour marking these elements as that one which was detected in left-dislocated topics, as seen in the previous section (§ 5.2.2), namely the presence of squinted eyes and raised eyebrows. However, these are also the non-manuals marking relative clauses in LIS. It is consequently possible to suppose that relative structures occupy a topic position marked by the same prosodic contours, or to consider these markers as multi-functional cues which can mark both relatives and topics.

An interesting insight into this issue is provided by the sentence (209) below, in which the use of the two types of marker is more clearly separated: the NMM of squinted eyes accompanies the aboutness topic object, while the NMM of raised eyebrows is produced during the remaining part of the sentence.

(209) Context: *Everywhere people are speaking about a book for children, but children seem not to like it. Do you know someone who liked it instead?*

sq eb+hn re eb

$BOOK_x$ PE_x $CHILD_j$ $READ_x$ DONE TOMORROW IX-2_{pl} MEET

'As for the book, tomorrow I will meet the child who has read it'.

BOOK PE CHILD READ

DONE TOMORROW IX-2 MEET

Figure 116. ‘As for the book, tomorrow I will meet the child who has read it.’

The example above leads us to suppose a specific linguistic role for the markers of squinted eyes and raised eyebrows. In particular, the use of the marker of squinted eyes seems to be specific to the aboutness topic, while the marker of raised eyebrows is specific to the relative clause.

Restrictive relative clauses in LIS are often marked by both squinted eyes and raised eyebrows, and have been assumed to be placed in a topic position. However, differentiating between the restrictive role and the topic function is not an easytask, since these markers generally overlap. The present sentence could provide evidence for a detailed analysis of the two non-manual markers, singling out the topic function (marked by squinted eyes) from the relative function (marked by raised eyebrows). Unfortunately, the paucity of examples collected in this investigation prevents us from generalizing on this question. Further research is therefore required for validating this hypothesis.

Another crucial point in the interpretation of left-dislocated structures is the presence of a resumptive pronoun or a pronominal expression in the main clause licensing the left-dislocated item. Indeed, such structures have also been defined in the literature as clitic left-dislocated constructions. This point was extensively addressed in § 2.2.2.1.2. Similarly, the elicited sentences collected here display the presence of resumptive linguistic forms licensing the interpretation of the supposed left-dislocated structures. Five examples produced provide a set of different linguistic strategies which could possibly be compared to the clitic pronominal expressions surfacing in spoken languages.

The proposal I am advancing here is that one resumptive function is fulfilled by the presence of agreement verbs. The agreement features, overtly realized throughout the direction of the verbal sign toward the position of the lexical item to which a locus has been previously assigned in the signing space, would license its base generation in the left periphery of the sentence. In the sentences (208) and (207), repeated for clarity below as (210) and (211), these verbal functions are indicated by subscripts, which explicitly link the verb to the dislocated object position.

(210) Context: The audience did not enjoy the movie. Have you met someone who has seen it?

re eb+hn re eb

MOVIE$_i$ **IX-3**$_i$ FRIEND$_x$ SEE$_i$ DONE PE$_x$ IX-1 TOMORROW WE MEET
'As for the movie, today we meet a friend who has seen it'.

(211) Context: There is an alley cat in the street, noone has ever seen it, but many people are looking for it. Do you know someone who has seen it?

re eb+ re eb
CAT$_x$ **IX-3**$_x$ YESTERDAY CHILD$_i$ PE$_i$ SEE DONE IX-1 IX-3$_i$ KNOW
'As for the cat, I know the child who saw him yesterday'.

A second strategy for licensing topic items that are base-generated outside the clause boundary is the phenomenon known as the 'weak hand hold' (Kimmelman 2014). In (212), the signer keeps the topic sign BOOK, which was supposedly base-generated outside the relative clause, salient by holding it with the non-dominant hand throughout the relative clause.

(212) Context: *Everywhere people are speaking about a book for children, but children seem not to like it. Do you know someone who liked it instead?*

sq eb+hn re eb
n.d.h. BOOK$_x$----------

d.h. PE$_x$ CHILD$_j$ READ$_x$ DONE TOMORROW IX-2$_{pl}$ MEET
'As for the book, tomorrow I will meet the child who has read it'.

Another language-specific strategy I am proposing as a means to license the externally base-generated topic object is the use of a size and shape specifier according in space with the topic object, as displayed in the example (213) below.

(213) Context: *Yesterday you were wearing a beautiful shirt at the party, but a child has spilled his ice cream on it. I am so sorry! Do you know anything about the consequence of this accident with your shirt?*

re eb re eb+hn
SHIRT$_x$ **PE**$_x$ CHILD$_i$ MAKE_DIRTY$_x$ **CL:STAIN**$_x$ MUM YELL_AT$_i$
'As for the shirt, the mum yelled at the child who made it dirty with a stain'.

In this case, the presence of the classifier is directed toward the signing space in which the shirt was produced, thereby creating an overt recall to the left-dislocated entity.

Since all of the contexts presented to the signer contained an agreeing verb, future investigations should test similar structures with non-agreeing verbs and without resumptive elements, in order to more thoroughly investigate the restrictions at play in such constructions.

The acceptability of these leftmost object constituents suggests that they be considered as syntactically base-generated in the higher topic projection within the left periphery. Indeed, if these topics were moved from their base position inside the clause the sentences would have been judged ungrammatical. As stated before, in fact, strong islands are sensitive diagnostic tools for movement because extraction of material from relative clauses that are strong islands leads to ungrammaticality. Therefore, we should assume that these left-dislocated objects were already base-generated in the left periphery of the sentence and that the following agreeing features of the verb could have licensed the use of left-dislocated items.

In line with the syntactic interpretation of a left-dislocated object, the aboutness topic seems to occupy a position higher than the relative clause. By using the example (214), the figure 117 shows a preliminary syntactic tree which presents a lower topic position occupied by the relative clause and a higher topic position occupied by the object that was base-generated in the left periphery of the sentence.

(214) CHEESE$_i$ SASS:ROUND MOUSE$_x$ EAT$_i$ PE$_x$ IX-1 CAPTURE DONE$_i$
sq re eb+hn
'As for the cheese, I have captured the mouse who ate it'.

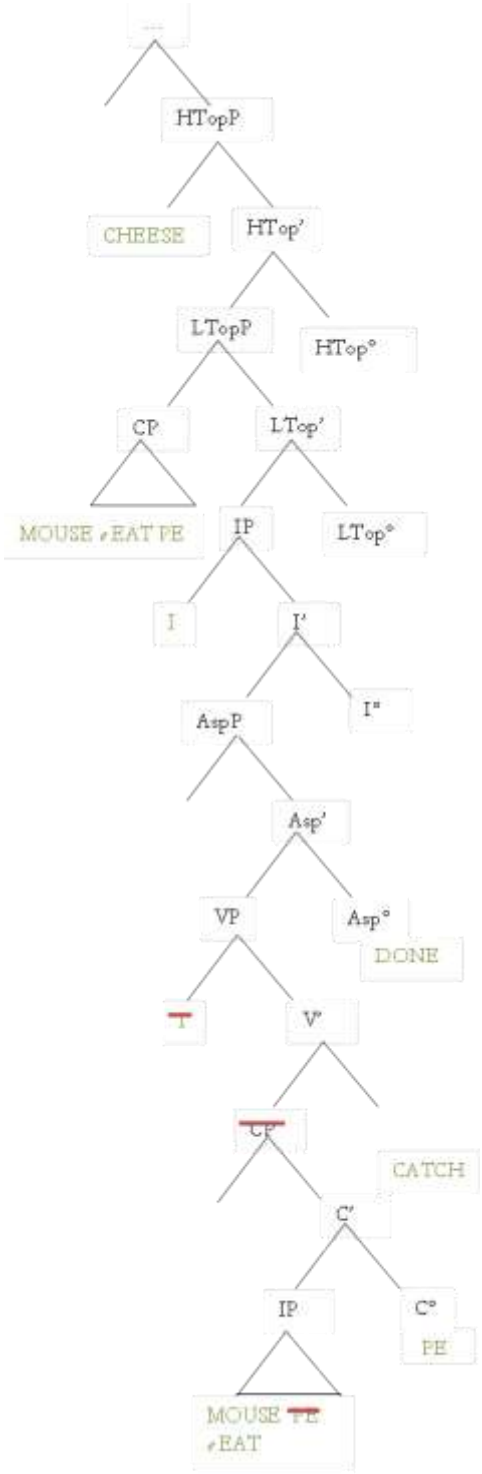


Figure 117. The first account of the base-generated nature of left-dislocated aboutness topics in LIS.

A similar analysis can be applied and extended to the other sentences discussed above. We can therefore conclude that, although the current research needs further investigation, and although a theoretical generalization from only one signer must be carefully considered, the aboutness topic object dislocated in the left periphery of the

sentence can be interpreted as base-generated in the leftmost part of the structure, rather than moved from its original position. The scope of this base-generated interpretation, however, should not be used as a widespread generalization for explaining all types of aboutness topics; rather, it is possible to state that it holds true at the very least when the relationship between the topic item and its trace is distributed across boundary islands.

This research represents the first step toward a better understanding of the syntactic properties of some aboutness topic constructions and, at the same time, it aims to shed light on the complex phenomenon of topicality in LIS. Based on the analyses conducted, the next section addresses the most common distribution of the three investigated topic types in LIS by considering both spontaneous and elicited data.

5.4 Sentence topic distribution in LIS

As previously addressed in the literature (§2.3.2.2.2), LIS is consistently a verb-final language, namely the unmarked word order is SOV. In addition, temporal adverbs typically precede locative descriptions (both adverbial or NPs) and such tendencies in previous studies have been used as signals for indicating the left boundary of the sentence.

One of the cross-linguistic strategies for realizing certain types of topicality is the syntactic manipulation of a sentence, something that languages also use for expressing focality. After the prosodic and syntactic analysis of different types of topic in LIS, it is possible to sketch a preferred distribution that takes into account the three topics object of my investigation: aboutness, scene-setting and contrastive topics. For the purposes of the current investigation, elicited sentences are also taken into consideration alongside the spontaneous data. Elicited data represents a valuable litmus test for validating the position of topics within the sentential boundaries.

In the examples (215) and (216) below, the most frequently used order of topics detected in the spontaneous data is as follows: the scene-setting topic of time (Sst-Time) precedes the scene-setting topic of location (Sst-Location) which, in turn, precedes the aboutness topic (Abt).

(215) Sst-time Sst-location Abt
LATER PICTURE FLOWER CHANGE
'Later, across the pictures, the flower changes'.
[De_st11_22]

(216) Sst-time Sst-location Abt

THEN PAINTING IX-3 FATHER MOTHER THE_TWO_OF_THEM SIT

'Then, in the painting, the dad and the mum take a seat.'

[Fi_st1_23]

The example (217) below, confirms the order presented above. Moreover, elicited sentences allow a better investigation of the position of sentence topic types, since they allow a more complex combination of topic types, something that is unusual in spontaneous discourse, despite not being ungrammatical. In the example below, this order was produced after the first piece of context, which introduced the life of a man called John and a young lady named Mary. In this case, the subject of the sentence (MAN) is the aboutness topic (MAN). Moreover, in the sentence both scene-setting topics of time and location play a role in setting the frame in which the proposition is held.

down

er hn+eb sq hn+eb er hn+eb

(217) TODAY IX-loc ESTATE AGENCY MAN_x $HOUSE_i$ $_xBUY_i$

'Today, at the estate agency, the man buys a house'.

[Na_el_2A]

The findings also display examples of syntactic modification through the fronting, or, rather, the base-generation of topic objects in the left periphery of the sentence, as shown in the elicited example (218) below. The context (B) presented for the elicitation of the following sentences considered the topic items as previously mentioned between interlocutors. They are, however, no longer salient in the discourse.

(218) Context B: *Gianni has wanted to buy a house for a long time. He has not liked any house until now. Finally, during this week, he found the perfect house for him. The house is big and bright, with a very nice garden. He has no doubts, tomorrow he will go to the agency to buy it.*

down

sq eb

$HOUSE_i$ IX-3_i FINALLY TOMORROW $JOHN_x$ $_xBUY_i$

'The house, finally, tomorrow Gianni will buy it'.

[Mi_el_2B]

In the same context, the objects were also produced between the scene-setting topics and the subject of the sentence, as displayed in (219) below.

	er	hn+eb	er	eb
(219)	TODAY	ESTATE AGENCY	$HOUSE_i$	MAN_x $_xBUY_i$

'Today, in the estate agency, the house the man buys'.

[Na_el_2B]

The syntactic placement of aboutness topics and scene-setting topics in LIS is almost always sentence-initial. The occurrence of topic objects in a clause-initial position preceding the subject confirms that aboutness topics occupy a syntactic position which is different from that of unmarked preverbal subjects.

On the basis of previous analyses carried out on spoken languages (Rizzi 1997; Benincà, Poletto 2004, Frascarelli, Hinterhölzl 2007) and sign languages (Kimmelman 2014), a syntactic hierarchy for aboutness and scene-setting topic types is proposed in (220). Examples (221) and (222), from my data, exemplify the hierarchy in (220):

(220) Scene-setting Topics of Time> Scene-setting Topics of Location>Aboutness Topics> [IP]

(221) Context: *Everyone knows the cat of the public park, he is very famous. Gianni's dog cannot bear him and yesterday he growled at him!*

	Sst-time	Sst-location	Abt		
	YESTERDAY	GARDEN	CAT_k IX-3_k	$JOHN_i$ DOG $POSS_i$	$GROWL_k$

'Yesterday, in the garden, John's dog growls at the cat'.

[Mi_elB_06]

In the example above, the aboutness topic item CAT is a left-dislocated topic object and precedes the subject of the sentence, while in the example below the aboutness topic item corresponds to the subject of the sentence.

	Sst-time	Sst-location	Abt		
(222)	YESTERDAY	GARDEN	$MARY_k$ CAT $POSS_k$	$MOUSE_j$	$BEAT_j$

'Yesterday, in the garden, Mary's cat beat a mouse'.

[Ma_elA_09]

Moreover, scene-setting topics both of time and location can be recursive within the same sentence, as shown in the following examples extracted from the spontaneous data:

Sst-time Sst-time
(223) SUDDENLY MONTH-LATER CL:LETTER-TAKE
'Suddenly, some months later, (he) takes the letter.

[Fa_10st_54]

Sst-location Sst-location
(224) ROW FACTORY CL:PRODUCT-TAKE
'In the row, inside a factory, (people) take the products.

[De_9st_49]

In line with the theoretical account, the sentential aboutness topic is assumed to be unique. Indeed, by definition, a sentence containing an aboutness topic can only convey additional information about that topic.

In both the spontaneous and elicited data that were collected for the present research, some exceptions with respect to this hierarchy were found: the aboutness topic precedes the scene-setting topic of time, or the scene-setting topic of location, as in example (225); or the aboutness topic follows the scene-setting topic of time, but precedes the scene-setting topic of location, as in example (226) below:

Ab-top Sst-time
(225) IX-3 BEFORE GO_AWAY
'He (the dog), before, was gone away'.

[Mi_mo_50]

Sst-time Ab-top Sst-time
(226) TODAY MARY UNIVERSITY INSIDE TEST MATH DONE
'Today, Mary, at the university, (she) did the mathematics test'.

[Mi_elA_08]

Despite these variations, the most preferred order of topic types remains the one presented in (220). We can therefore suppose that previous studies in LIS (Brunelli 2011, Branchini 2014), which detected the existence of higher and lower topic positions, were correct, despite that fact that their accounts were not comprehensive regarding the total number of topic positions allowed. In light of the current analysis, it is possible to propose the existence of three dedicated topic positions which are

respectively filled with the scene-setting topics of time and location, and the aboutness topic. However, as postulated by Benincà and Poletto (2004), there also potentially exists a macro-domain, reserved for scene-setting topics and further divided into temporal and locative information. The scene-setting domains seem to be higher than the aboutness topic domain, as better illustrated below, through a consideration of both the syntactic and pragmatic properties of topic types.

(227) [Scene-setting topics [Aboutness topics [Focus Field]

[Temporal [Locative expressions[LD Topics[Subject topic[Focus Field]

| FRAME || THEME || FOCUS |

(adapted from Benincà & Poletto 2004:27, ex. 58)

However, if contrastive topic items are also considered, the hierarchy is enriched, and the following word order holds true in LIS.

(228) Scene-setting Topics of Time> Scene-setting Topics of Location>Aboutness Topics> Contrastive (parallel) topics[IP]

The examples (229-231) below display the distribution of aboutness and contrastive topics.

Context: *What do Mary and John think about the cauliflower?*

Abt Contr-top1 Contr-top2

(229) CAULIFLOWER IX-3 IX-3 MARY LOVE IX-3 JOHN HATE

'As for the cauliflower, Mary loves it, while John hates it.'

[Mi_elC_08]

Context: *What do Mary and John think about the dog?*

Abt Contr-top1 Contr-top2

(230) DOG JOHN LOVE INSTEAD MARY HATE

'As for the dog, John loves him, whereas Mary hates him.'

[Ma_elC_01]

Context: *Yesterday there was a little cat in trouble in the street. What did Mary and John do with him?*

Abt Contr-top1 Contr-top2

(231) CAT IX-3_k JOHN IGNORE$_k$ INSTEAD MARY SAVE$_k$
'As for the cat, John ignored him, but Mary saved him.'
[Na_elC_02]

In the case of contrastive topic objects, it is interesting to note that their position may vary, allowing the contrastive object to be placed before the aboutness topic constituent (Abt), as displayed in the examples (232) and (233) below:

Context: *What does John think about the theatre and the cinema?*

Contr-top1 Abt Contr-top2
(232) THEATRE JOHN HATE INSTEAD CINEMA LOVE
'John hates the theatre, while he loves the cinema.'
[Na_elC_10]

Contr-top1 Abt Contr-top2
(233) FISH MARY IX-3 HATE PIZZA IX-3 LOVE
'The fish, Mary hates it, while she loves pizza.'
[Mi_elC_06]

In the case of the preponed position of a contrastive topic object with respect to the aboutness topic, some doubts may arise, as the signer may have interpreted it as an aboutness topic. However, the use of non-manual markers specifically pertaining to contrastive topics, i.e. the rightward and leftward body leans, allows for an interpretation of these elements as contrastive topics.

Although there is some variation in the data, contrastive topics are more often produced after aboutness topics, as shown in (234) below:

Abt Contr-top1 Contr-top2
(234) MARY PIZZA LOVE FISH HATE
'Mary loves pizza, while she hates fish.'
[Ma_elC_06]

Except for some variations, the hierarchy displayed in (234) above is the preferred one, and is based on the most common word order produced by signers. Although the small number of elicited contrastive topic items did not permit a more comprehensive account for this distribution, which could perhaps vary in further investigations, this analysis is

still useful for sketching a preliminary distribution of topics in LIS. Future research should increase the quantity of data on contrastive topic subjects and objects, in order to better investigate this syntactic phenomenon.

5.5 Challenges and unresolved issues

The current study conducted a more detailed analysis of the three types of topic considered - aboutness, scene-setting and contrastive topics - from a syntactic point of view.

Moreover, this study has focused on a specific syntactic construction related to the aboutness topic: the left-dislocated structure. Although the diagnostic test of strong islands shows the base-generated nature of left-dislocated objects in the left periphery of the sentence, it would be interesting to repeat a similar linguistic test with sentences involving subject aboutness topics.

A litmus test should be designed to verify the soundness of the proposal advanced here, namely, that based-generated topic objects are allowed in LIS relative constructions only in the presence of licensing strategies (such as agreeing classifiers, agreeing verbs and the weak hand hold within the relative clause). In the absence of the licensing strategies outlined above, this test should submit relative clauses displaying a left-dislocated object to the signers' judgement.

In addition, syntactically speaking, several phenomena related to the three topic types investigated, such as hanging topic constructions, remain unaccounted for. These structures have been excluded from the current investigation, as they fulfil a syntactic role different from the sentence subject or object and the many variables at play might have complicated the data analysis. In this sense, the present study must be considered as a preliminary step towards a more comprehensive approach through which topichood can be understood.

The test conducted on aboutness and scene-setting topics has allowed us to sketch an initial hierarchical distribution of such elements within the boundary of the LIS sentence. Nonetheless, many areas, such as contrastive constructions, still need to be syntactically explored. In cases of contrastive topics, spontaneous data is particularly important in order to compare their distribution with scene-setting and aboutness topic items. Contrastive topics, in fact, could be part of an intermediate domain between aboutness topics and focus items. In order to test these phenomena, however, syntactic research on focus items is also required. Further investigation on focus in LIS would

also enrich the hierarchy concerning the position of scene-setting and aboutness topics proposed in the current study.

Although much work remains to be done in order to further understand these complex phenomena, the current study represents a first step towards achieving a clearer understanding of the syntactic phenomena related to topicality in both sign and spoken languages.

5.6 Conclusions

In answer to the research question 5.1, the current study has investigated the syntactic realizations of three sentence topic types: aboutness topics, scene-setting topics and contrastive topics. The first type, aboutness topics, represents what the sentence is about and conveys information that has already been shared between the speaker and the addressee. In LIS, these types of topic may be encoded by different linguistic items, such as the sentential subject, which are assumed to occupy a topic syntactic position and can be optionally marked by the topic contour or separated from the rest of the sentence by prosodic boundaries, or by subject and object being left-dislocated in the left periphery of the sentence. In this latter case, the left-dislocated object in particular seems to be base-generated in the leftmost part of the sentence rather than moved from an original position.

Scene-setting topics are frame-setters which established the background information within which the main sentence takes place. Despite the debated nature of scene-setting topics in the literature, these elements do seem to exist in LIS and convey temporal or locative information that can restrict and limit the interpretation of the whole sentence. From a syntactic point of view, these topics seem to be divided from the remaining part of the sentence by syntactic boundaries. These boundaries may be reflected in the structure through prosodic contours, such as eye blink and head nod, which correspond to the pauses detected in oral language after a topic item. In the LIS sentential structure, scene-setting topics generally occur in the initial part of the sentence, before aboutness topics. Although variations from this order are possible, this distribution seems to be the preferred one for signers. Finally, the third type of topic which has been investigated, the contrastive topic, seems to occupy a syntactic position lower than that of scene-setting and aboutness topics.

By considering the research question 5.3, it is possible, therefore, to sketch an initial syntactic hierarchy for these types of topic that holds true in LIS: scene-setting topic of time > scene-setting topic of location > aboutness topic > contrastive topic. This account seems to confirm the hypothesis put forward by Benincà and Poletto (2004)

regarding the management of the left periphery. The hypothesis is in line with theories that establish a communicative progression from older to newer information. This way of proceeding in communication may be mirrored in the subdivision of the macro-fields arising in the left periphery of the sentence. According to Benincà and Poletto's hypothesis, the aforementioned hierarchy may be subdivided into three main macro-spheres: frame (containing both scene-setting topics of time and location), theme (containing the aboutness topic projection in several syntactic forms), and the contrastive field, which is in between the topic and the focus field, or within the focus field. In fact, although they have not been investigated in this piece of research, contrastive topic items might occupy the lower position of the theme field, a position in contact with the focus field. This could explain the hybrid nature of contrastivity, which can arise between the topic and the focus field, involving both topicality and focality values (as also stated by other scholars for both spoken and signed languages (Krifka 2008, Navarrete in prep).

The analysis of the syntactic features displayed by several aboutness topic constructions was first illustrated with a particular insight into the moved or base-generated nature of left-dislocated structures. In this regard, it is possible to answer research question 5.2 by hypothesing a base-generated nature of aboutness topics encoded as left-dislocated items of complex structures, as extensively shown in § 5.3.

In light of the above, the study proposes syntactic analyses which have never been addressed in LIS before, even though much work remains to be done, especially regarding the application of the syntactic analysis to other structures (such as hanging aboutness topics, which are neither subjects, nor objects of the sentence) and an increase of the quantity of data concerning contrastive topics.

Having addressed the prosodic and syntactic feature of topics, the following chapter focuses on the pragmatic aspects related to topichood. In the next chapter, aboutness topic items are investigated for the first time as referential expressions related to the complex system of the retrievability of information in LIS. The chapter also sketches out a preliminary referential hierarchy, taking into account the informational status of these constituents, as well as other factors related to the notion of accessibility.

CHAPTER 6.
Referential expressions, referential hierarchy and topicality in LIS

6.1 Introduction

In line with the main tendencies revealed in previous studies of ASL, the results for LIS confirm the expectations concerning the management of syntactic categories that are clearly related to the informational status of discourse referents, as well their intonational contours. Some unexpected results arose, however, concerning these correlations, which do not seem to represent a triangulation; rather, the data supports a bidirectional model where prosodic and pragmatic properties are encoded by syntactic forms, and does not display a direct relationship with one another.

The following sections report on the findings, showing in detail how different referential expressions are distributed among the two different sets of data, and how their distribution is meaningful with respect to their assumed accessibility and the prosodic cues for retrievability.

In order to better understand the results, the average of the propositions, their length in minutes, and the number of signs produced, are briefly discussed and exemplified in the table below. The data displays an average number of propositions for each LIS story of 60.15 (Min=50; Max=75,4) and an average number of propositions for each LIS monologue of 90 (Min=52; Max=125). However, if we consider the average number of propositions for each of the three sessions of stories, the results show that there are 51.95 propositions for the first session, 66 propositions for the second session, and 62.70 propositions for the last session.

Each section retold by the signer in the Story-telling has a mean length of 1.73 minutes, reaching a total of 52 minutes. In contrast, each monologue has a mean length of 2.60 minutes, while the sum of all six Monologues lasts for a total of 16 minutes. A random analysis of 3/30 transcriptions of the stories displays an average of 133 signs per narrative. Meanwhile, a random analysis of 2/6 Monologues displays an average of 240 signs.

Table 30. Number of propositions, length in minutes and number of signs per piece of production in the two spontaneous data: Monologues and Story-telling.

Type of data	Number of propositions per piece of production	Length in minutes per piece of production	Number of signs per piece of production
Story-telling	60.1	1.7	133
LIS Monologues	97	2.6	240

In order to offer a better account of the referential expressions and the communicative system in which they were produced, the contents of the next sections are allocated as follows: § 6.2 focuses in detail on referential expressions and, more specifically, checks the relationships between shifted contexts and the occurrence of referential expressions. § 6.3 addresses the relationship between activation and referential expressions. It investigates the referential hierarchy resulting from the relationships that the referential expressions create with one another with respect to their pragmatic and prosodic characteristics. § 6.3.1 considers a variety of nominal forms assumed to be full informative categories, such as DPs, NPs or modified DPs. Indexical expressions that fulfil pronominal functions are analysed in § 6.3.2 with reference to their distribution and the context of their occurrence. Finally, § 6.3.3 discusses cases of subject omission, specifying the difference according to the type of verb (i.e. agreeing or plain), or the correspondence with language-specific strategies, such as role shifts and predicative classifiers.

6.2 Referential expressions in LIS

All types of expected reference expressions (§ 3.2.2) were found in the LIS data, although the prominent strategy used for referring to previously mentioned entities remains the omission of the argument, as was also stated by recent studies on LIS (Santoro et al. 2017) and other sign languages (Perniss & Özyürek 2014 for DGS, Frederiksen & Mayberry and Czubek 2017, Ahn 2019 for ASL).

Before addressing each referential form detected in the data in more detail, a brief overview of the average number of referential expressions in the two types of production (LIS Story-telling and LIS Monologues), will be given along with the average number of references and competitors. These numbers are important to better understand the following analyses. In fact, the number of references presented in the

different types of dataset may represent a crucial factor in the variation of the way information is managed in a communicative system.

Story-telling displays an average number of referential expressions equal to 16.13 referential items per story. The total number of referring expressions in the stories is 1172. On the other hand, the average count of referential expressions in the Monologues is 80.66, while the total count of referential expressions in the Monologues is 484.

As already pointed out in the methodology (§ 3.4.2), the number of referents strongly varies between the two types of data and depends on the signers' productions. The Story-telling produced by the three pairs of signers displays a number of referents much higher than the number of entities involved in the Monologues. Indeed, the average number of referents in each of the LIS Story-telling cases is equal to 25.5 for a total number of 153 entities, while by contrast the number of referents in the Monologues is 5.5 for a total quantity of 33 entities. The management of information, however, does not appear to have been as heavily influenced by these variations as one might have expected, except for some small differences. This may confirm that, after a certain number of competitors, information is similarly set up between speaker and addressee, despite the distinct textual complexity. This topic is further addressed in § 6.3.1. The table (31) below displays how referential expressions were distributed among the two types of data with respect to the informational status they encoded.

Table 31. Numbers and proportions of referred expressions occurring in the two types of data with respect to their informational status (shifted/continued) in the present study.

Type of data	**Topic Continued**	**Topic Shifted**	**Total**
Story-telling	65% (756)	35% (415)	(1171)
Monologues	63% (305)	37% (11%)	(484)
Total	64% (1061)	36% (594)	100% (1655)

The referential forms that display a mantained status across sentences are almost double the number of referential expressions reintroduced (shifted) in the discourse. Although similar results confirm the asymmetry between mantained and reintroduced contexts, which has also been pointed out by other cross-linguistic investigations in SLs (Perniss & Özyürek 2014 for DGS; Frederiksen & Mayberry 2016 and Czubek 2017 for ASL), it is interesting to note that in a more detailed comparison this asymmetry is weaker in LIS. The table (32) below provides a cross-linguistic comparison between LIS and the two studies conducted for ASL.

Table 32. Proportions of the total number of referring expressions by informational status in the current study in LIS, compared with the three re-proportioned[31] studies in DGS (Perniss & Özyürek 2014) and ASL (Frederiksen & Mayberry 2016, Czubek 2017).

Type of data	**Topic Continued**	**Topic Shifted**	**Total**
Current study in LIS	64% (1061)	36% (594)	1655
DGS (Perniss & Özyürek 2014)	23% (22)	77% (74)	96
ASL (Frederiksen & Mayberry 2016)	91% (310)	9% (31)	341
ASL (Czubek 2017)	77% (306)	23% (89)	395

The clear asymmetry displayed in Frederiksen & Mayberry's study between reintroduced and mantained references may be due to the simplicity of the story line and the small number of competing entities. Czubek's study increases the number of competitors and the complexity of plot in the stories. This may have affected the increase in reintroduced (shifted) topics. Indeed, the simplicity of the stories may have resulted in fewer chances to reintroduce referents into the discourse, thereby enhancing the use of mantained (continued) topics.

As for Perniss & Özyürek's study (2014), the asymmetry between mantained and reintroduced referents is reversed. This is due to their selection of referential expressions. Indeed, for the purposes of their analysis, only overt realizations of referential expressions (namely nominal and pronominal forms) were considered. The lower value of maintained references in their data could be explained by the lack of null arguments in the analysis. In fact, null arguments are expected to be used frequently in maintained contexts, so the absence of this linguistic strategy in their study might have affected the results.

The lower discrepancy between continued and shifted topics in the present study is likely a consequence of the increased complexity of narratives and the large numbers of competitors. An analysis of their detailed behaviour is provided in § 6.3. The table (33) below offers a general overview of the occurrences of topic expressions with respect to their informational condition as either continued or shifted topics:

[31] The percentage is re-proportioned in order to be adapted to the current study and, in fact, both studies of ASL considered newly introduced referents occurring for the first time.

Table 33. Occurrence of referential expressions DPs, pronouns and null arguments with respect to their shifted or continued status.

Referential Expressions	**Topic continued**	**Topic shifted**	**Total**
DP	22% (81)	78% (288)	100% (369)
Pronouns	41% (94)	59% (136)	100% (230)
Null arguments	84% (886)	16% (170)	100% (1056)
Total	64% (1061)	36% (594)	100% (1655)

The table above is ranked according to how the referential expressions occur in discourse in cases of mantained and reintroduced contexts. In line with previous cross-linguistic studies, DPs are mostly used in reintroduction contexts (78%), while, by contrast, null arguments are mainly employed in cases of continued context (84%), i.e. when the reference is kept constant across multiple sentences. Pronominal expressions seem to occupy an intermediate position. Indeed, these elements may be used in both mantained (41%) and reintroduced (59%) contexts, with a slight preference for reintroduced ones.

By comparing these results with those from previous studies, cross-linguistically DPs are undisputedly used in reintroduced contexts. The percentage of pronominal expressions is comparable and aligned to Czubek's study on ASL, which presents 8% of pronominal occurrences in maintained contexts and 7% of pronominal occurrences in reintroduced contexts. However, the comparison of other strategies is made more complex owing to the taxonomic differences in categorizing referential structures.

Frederiksen & Mayberry's study, for example, condensed the agreeing verbs and role shift into a unitary category (which they define as constructed action) and documented classifier constructions differently. By contrast, in the present study, the null category contains and is categorized depending on the type of verb (plain or agreeing) and the presence of other language-specific anaphoric strategies, such as classifier predicates and role shift (this category is addressed in detail in § 6.2.3).

Similarly, a detailed comparison with Czubek's study is excluded, because he distills referential expressions which are here considered in a more unitary manner, as seen in his codification of three different types of classifier (semantic classifiers, instrument classifiers and descriptive classifiers)[32] into separate categories. For the purposes of the current study, only semantic and handling classifiers are placed together as predicative

[32] For a more detailed account of the methodology adopted in the two studies on ASL, see Frederiksen & Mayberry (2016:8-11) and Czubek (2017, chapter 3).

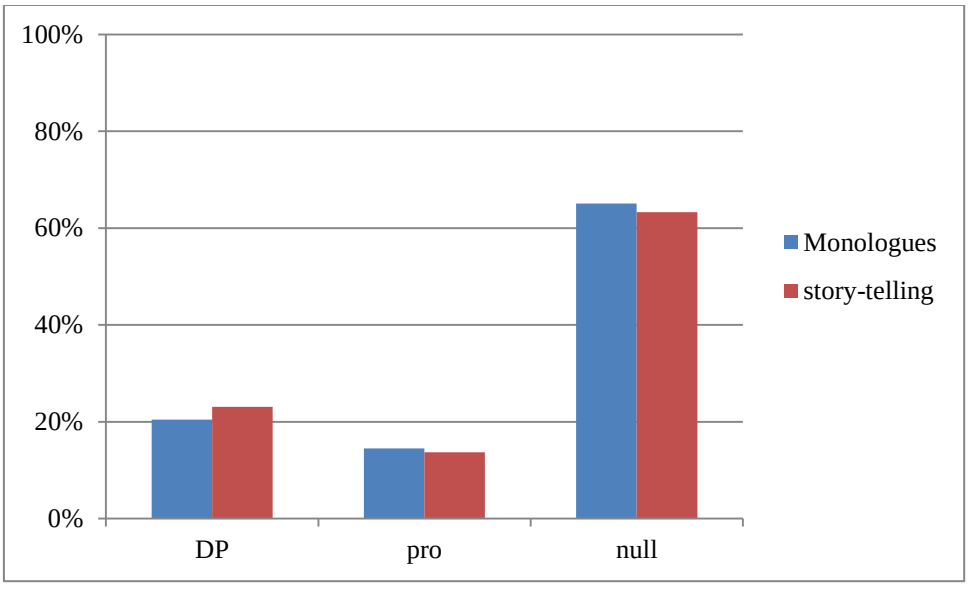
classifiers. As stated in § 2.2.4.1.3, since the categorization of descriptive classifiers as anaphoric strategies is a debated issue in the literature (Zwitserlood 2012), these strategies have been left aside for future investigations of LIS.

Finally, a comparison of the findings with respect to the two different data sets points out that Story-telling presents a slightly greater percentage of referential expressions than Monologues, except for null arguments, which display a slightly reversed proportion. This small discrepancy is visible in the table (34) and the chart (5) below:

Table 34. Distribution of referential expressions in Monologues and Story-telling in the LIS data.

Referential Expressions	**Monologues**	**Story-telling**
DPs	20% (99)	23% (270)
Pronouns	15% (70)	14% (160)
Null arguments	65% (315)	63% (741)
Total	100% (484)	100% (1171)

Chart 5. Distribution of referential expressions in Monologues and Story-telling in the LIS data.

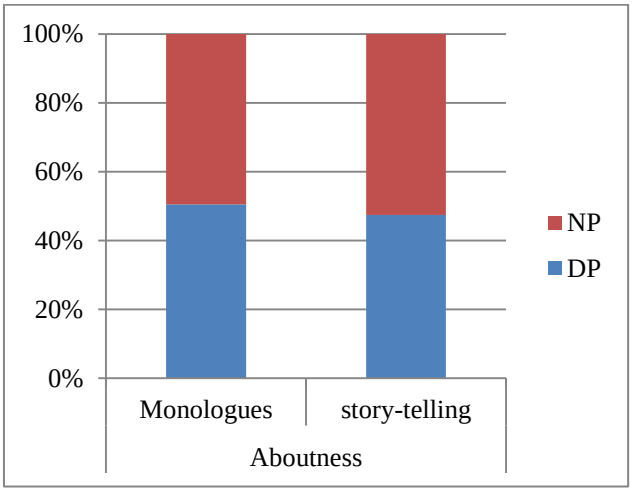


The next section offers a more detailed account of the selected and analysed referential categories in relation to their function in encoding informational status.

6.2.1 Nominal Phrases (NP) and Determiner Phrases (DP) in LIS

The total occurrence of DPs and NPs in the two types of data was 369: 99 items (27%) were found in the Monologues and 270 items (73%) were present in the Story-telling. Within this data, there were a total of 178 DPs and 191 NPs. In particular, the Monologues show a split of 51% of DPs (50) and 50% of 49 NPs (49); similarly, within the Story-telling 47% were DPs (128) and 53% were NPs (142), as displayed in the bar chart (6) below. Therefore, the proportion of DPs and NPs for each type of data are nearly equal, standing at almost 50% each.

Chart 6. Proportion of DPs and NPs with respect to Monologues and Story-telling in the LIS data.



Examples of both referential expressions (DPs and NPs) extracted from the present data set are offered in (235) and (236) below. In the first example, the DP is accompanied by the markers of chin down (down) and squinted eyes (sq) and divided from the rest of the sentence by the markers of eye blink (eb) and head-nod (hn). In the second example, the NP is marked by squinted eyes (sq).

down
sq eb+hn

(235) LATER IX-3 CHILD IX-3 GIRL $CHILD_x$ $IX\text{-}3_x$ BAD CL:LIE-DOWN WAKE UP

'Later, the little girl, she, who was lying in the bed, woke up.' [Fi_1st_29]

sq

(236) NEWSPAPER TAKE

'The newspaper is taken.' [De_9st_11]

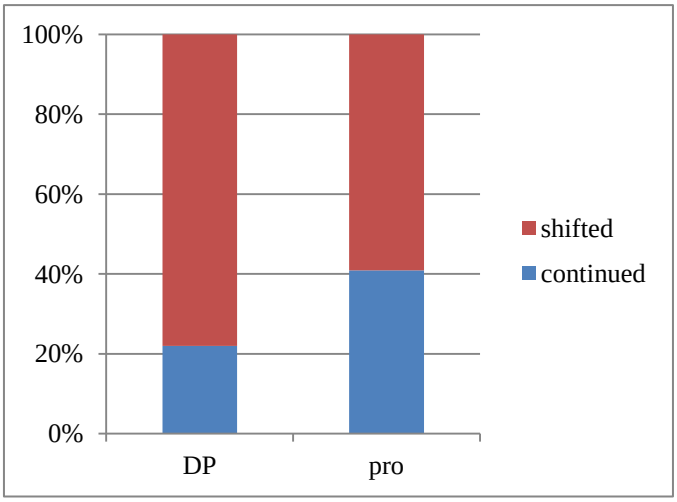
As observed in Table (33) displayed above in the previous section, nominal and pronominal expressions are mainly used for encoding shifted entities in the discourse whileother strategies, by contrast, are infrequent. This asymmetry is present in both types of data. Therefore, by focusing on the occurrences of nominal and pronominal expressions together, the findings show that referents that have been reintroduced into the discourse are more likely to be realized as full DPs or NPs, rather than pronouns. This is in line with previous studies on spoken languages (Givón 1983, Ariel 1988), which state that the less accessible the referents are, the more linguistic material is required in order to make them retrievable, and vice versa (the more salient a referent is, the less linguistic material is needed for encoding it).

These choice preferences are detectable by observing the asymmetric proportion of data between the referents encoded as nominal or pronominal expressions in the table (35) below. The same percentage is more visibly exemplified in the bar chart (7), where the data is counted with respect to nominal expressions (DPs) or pronouns (pro).

Table 35. The data on the occurrence of shifted and continued aboutness topics as DPs or pronouns.

Aboutness Topics	**DPs/NPs**	**Pronouns**
Continued	22% (81/369)	41% (94/230)
Shifted	78% (288/369)	59% (136/230)
Grand Total	22% (369/1655)	14% (230/1655)

Chart 7. The graphic realization of shifted and continued aboutness topics as DPs or pronouns.

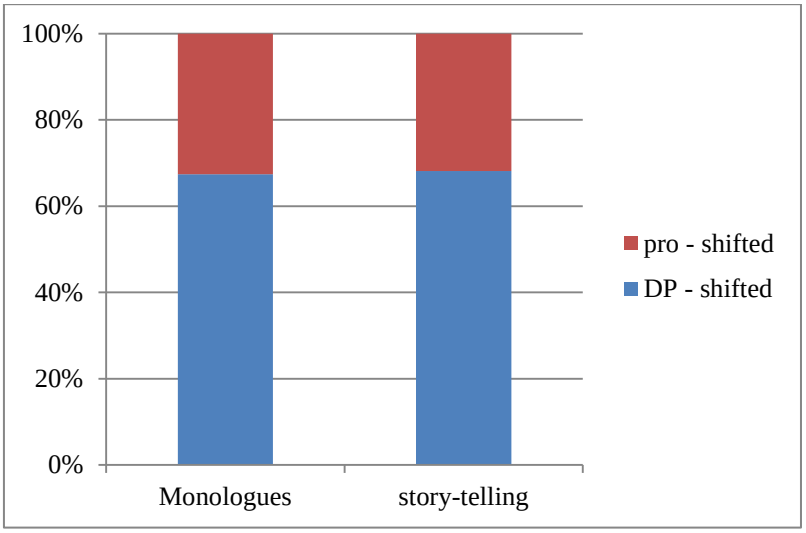


By focusing on their function as reintroduced referents, and by carrying out a similar analysis with respect to the difference between the two types of data, it is evident that the proportion of nominal and pronominal expressions in reintroduced contexts is almost the same within the different data sets, as demonstrated by the table (36) and the chart (8) below:

Table 36. The occurrence of shifted nominal and pronominal expressions with respect to Monologues and Story-telling.

Aboutness Topics	**Shifted DPs/NPs**	**Shifted pronouns**
Monologues	67% (89/132)	33% (43/132)
Story-telling	68% (199/292)	32% (93/292)
Grand Total	68% (288/424)	32% (136/424)

Chart 8. The percentage of shifted nominal and pronominal expressions with respect to Monologues and Story-telling.



A more detailed account of pronominal expressions is provided in § 6.2.2.

In order to conduct a more reliable analysis of these findings, a test was run with the R software for analysing whether there are significant correlations between shifted transitions and overt realizations of topics, or between shifted transitions and nominal or pronominal expressions. In other words, a test was carried out with the purpose of better understanding whether the realization of reintroduced topics through overt syntactic categories, such as nominal and pronominal referential expressions, was statistically significant. In addition, the model shows us the preference for nominal or pronominal expressions in shifted transitions.

We predicted that there would indeed be a significant correlation between topic shift and overtness. The null hypothesis (H_0) is that no correlation exists between these phenomena, while the alternative hypothesis (H_1) is that topic overtness and shifted topic are significantly correlated in LIS. Moreover, we predict a stronger correlation between shifted transitions and nominal expressions, than between shifted transitions and pronominal expressions. In order to carry out this analysis, we first restricted the topic type to aboutness topics (LIS2=1655 items), as displayed in Picture (128) in the Appendix.

We then created a mixed effects logistic regression model for testing these correlations, establishing a set of contrasts for indicating (i) the overtness of the referents, i.e. the realization as nominal or pronominal expressions of aboutness topic versus null arguments (+overt;-null), and (ii) the orthogonal contrast for nominal versus pronominal forms (+DP-pro), (iii) the context of occurrence, namely their shifted or continued informational status (+shifted;-continued), and (iv) the data types as fixed effects (+monologues;-story); These contrasts are displayed in Picture (129) in Appendix II.

Two statistical tests were conducted to carry out this analysis, one with random slopes and one with random intercept without the interaction. Both displayed significant results. The first, more complete model was considered, as has already been explained in the methodology § 3.4.4.3. The created model is displayed in the Appendix, Picture (130).

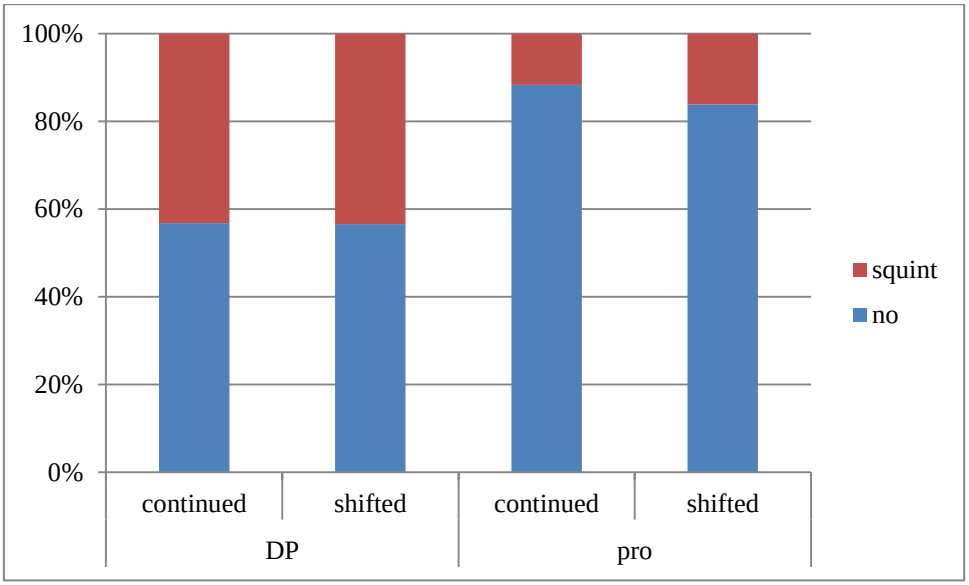
The statistical model shows that the correlation between the overt realization of topics and their informational status as a reintroduced (shifted) reference is significant (estimated *odds ratio* 15.56, $p<0.001$). We can therefore conclude that shifted topics are more likely to be overt (realized as nominal or pronominal expressions) than they are to be omitted as null arguments. In this light, we can state that the occurrence of nominal expressions as reintroduced topics is not random, and that reintroduced referents are more likely to be overtly realized in an LIS discourse.

The results of the analysis show that nominal expressions are more likely to be used in reintroduced contexts than pronouns, and this is in line with expectations (*estimated odd ratio* 3.86, $p<0.001$). A picture of the results is displayed in the Appendix, Picture (131).

We can conclude that the choice between nominaland pronominal expressions is not arbitrary, but it correlates with shifted contexts. Moreover, we can affirm that these correlations hold in both types of data in which they were produced, although they seem to be stronger in the Monologues than in the Story-telling.

Interestingly, the analysis of the data also reveals a frequent occurrence of nominal expressions accompanied by non-manual prosodic signals, as described in detail in § 4.1. Among others, the most frequently used non-manual marker is the presence of squinted eyes. Although this marker accompanies nominal expressions in both reintroduced and mantained contexts, as displayed in the chart (9) below, it spreads over nominal expressions more often than pronouns.

Chart 9. The realization of continued and shifted nominal and pronominal expressions accompanied or not accompanied by squinted eyes.



In addition, the table below offers an account of the general proportion of nominal and pronominal expressions with respect to the continued and shifted transitions and the occurrence of the non-manual marker of squinted eyes. From the table below, it is possible to notice that the marker of squinted eyes generally arises in cases of nominal expressions. By contrast, pronominal expressions are accompanied by this marker less frequently, as displayed in the cell highlighted below:

Table 37. Grand total of the distribution of nominal and pronominal expressions arising in continued and shifted contexts, with respect to the presence of squinted eyes.

Referential expressions with respect to contexts	**Squinted eyes**	**Lack of squinted eyes**	**Total**
Nominal expressions	43% (160)	57% (209)	100% (369)
Continued	9% (35)	12% (46)	21% (81)
Shifted	34% (125)	44% (163)	78% (288)
Pronominal	14% (33)	86% (197)	100% (230)

expressions			
Continued	5% (11)	36% (83)	41% (94)
Shifted	9% (22)	50% (114)	59% (136)

Another logistic regression with a variable mixed effect model was developed in order to provide clearer evidence that, in line with expectations, nominal expressions in LIS are significantly correlated with the prosodic marker of squinted eyes. For the purpose of running the test, omitted topics were excluded from the corpus and only overt realizations of referents were considered (LIS3= 599 items[33]), as displayed in the Appendix, Picture (132).

The investigation yielded similar contrasts to those of the previous model, such as the contrast between Monologues and Story-telling (+monologues;-story-telling) for creating an average between the two types of data; the contrast of shifted and continued transitions (+shifted; -continued), and the contrast between nominal and pronominal expressions (+DP; -pro). These contrasts are reported in the Appendix, Picture (129).

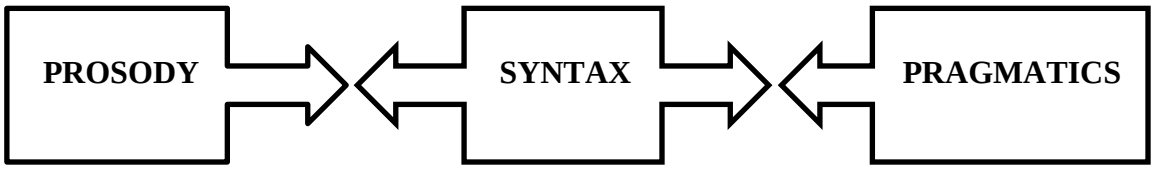
The null hypothesis (H_0) is that no correlation exists between the non-manual marker of squinted eyes, the reintroduced contexts and the realization of topics as DPs or pronouns. By contrast, the alternative hypothesis (H_1) supports the existence of these correlations. As in the previous analyses, two tests were conducted, one with random slopes and one with random intercept without interactions. Again, both turned out to be significant, and therefore the more complex model has been taken into consideration.

The model shows that DPs are significantly more likely to be marked by squinted eyes (*estimated odds ratio* 7.55, $p<0.001$). The effect of topic shift is not significant, nor is the interaction between DP-pro and topic shift. It means that the possibility of squinted eyes as marker of a nominal expression is almost 8 times higher than that of this marker occurring with pronominal items. No straightforward correlation was found between squinted eyes and shifted topic, but there was a significant correlation between this marker and the realization of aboutness topics as DPs. If we recall that a significant correlation was also found between the choice of nominal expressions and the occurrence of shifted contexts, it is possible that the use of nominal expressions plays a role in triggering the prosodic marker of squinted eyes alongside pragmatic shifted transitions.

The data shows a direct relationship between the realization of referential expressions and the topic shift, as well as between the encoding of referential expressions and the

[33] The number corresponds to the sum of nominal and pronominal expressions found in the spontaneous data.

presence of squinted eyes. The fact that no straightforward relationship arose between squinted eyes and shift might indicate that syntax plays a crucial role in encoding both prosodic and pragmatic functions in LIS. We could therefore postulate a model in which prosodic and pragmatic functions converge in the syntactic codification, since no direct interaction between prosody and pragmatic contexts has been detected in the current analysis. A scheme of the bidirectional correlations of the syntactic category of nominal expressions is provided below:

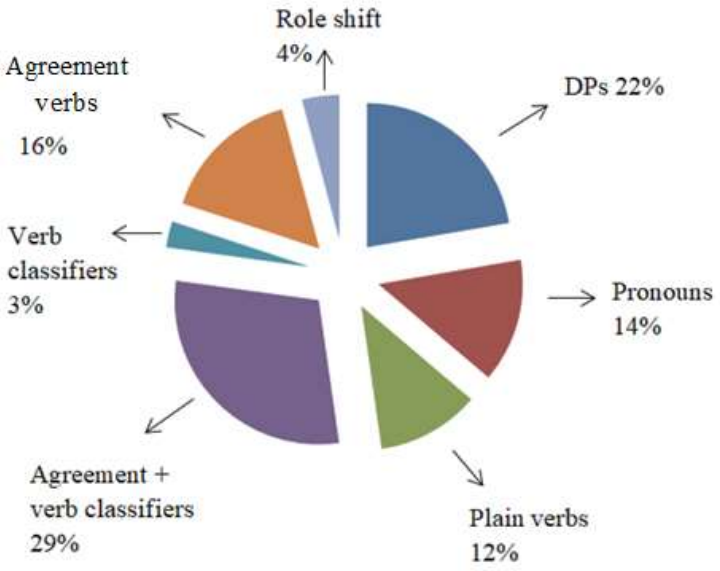


We can therefore conclude that the syntactic category of nominal expressions serves a mediator function between the prosodic and pragmatic layers, and may be considered as reflective of the accessibility condition of both the intonational and informational status of referents. The absence of a significant straightforward correlation between prosody and the informational status of topics suggests the crucial mediator function of syntax in discourse.

6.2.2 Pronouns in LIS

Indexical elements are referential expressions that denote a previously mentioned entity by pointing the finger towards a particular location in space. Among the total number of referential expressions, there are 230 instances (14% of the cases) of indexation being used with pronominal functions in the two types of data. Of these, 70 (30%) items appear in the Monologues and 160 (70%) in the Story-telling. This is displayed in Chart (10) below, which shows how the different types of referential expression are distributed in discourse.

Chart 10. Distribution of referential expressions with respect to the total number of the LIS data: both Monologues and Story-telling.



Two examples of pronominal referential expressions have been extracted from the current LIS data and reported below in (237) and (238). In the first example, the pronominal expression is separated from the rest of the sentence by a head nod (hn), while, in the second example, the pronoun is accompanied by the non-manual marker of backward head tilt (bht).

hn

(237) IX-3 GO INSIDE

'He (the man) goes inside.' [De_5st_04]

bht

(238) IX-3_X HAVE_TO SAME

'He (the man) has to do the same.' [Na_6st_65]

Unlike Frederiksen & Mayberry's (2016) study of ASL, the proportion of pronouns arising in the current study into LIS is greater. As already stated in § 2.2.4.1.2, the almost total absence of pronominal expressions in their study may be attributed to the extreme simplicity of the narrative plot in the stories and to the paucity of entities functioning as competitors. The proportion of indexation in the present study on LIS is, however, comparable to the study conducted by Czubek (2017) for ASL, which averaged 15% in *the Balloon Stories*.

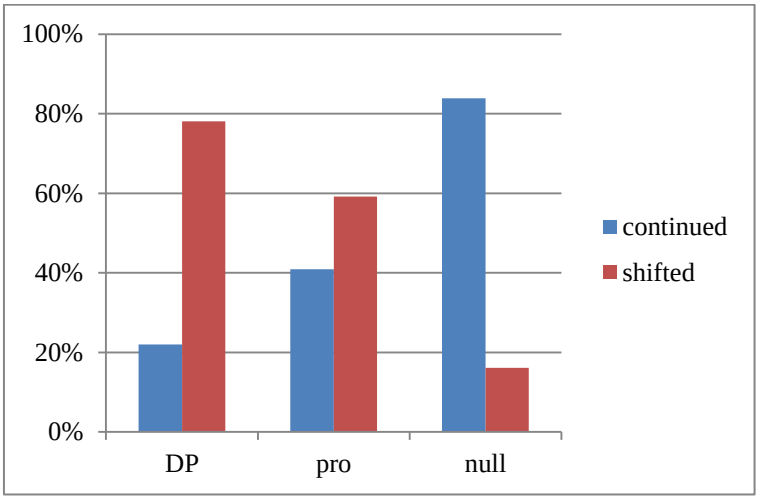
Moreover, the LIS data shows that pronominal expressions occupy a mediator position with respect to their accessibility status, as displayed in the table (38) and graphically represented in the chart (10) below. For the sake of clarity, the previously mentioned

referential strategies, which are mostly used with maintained contexts such as agreeing verbs, plain verbs, or classifier verbs, are grouped together under the label of null arguments in the table below:

Table 38. Proportion of nominal expressions (DPs), pronouns and null arguments with respect to their maintained (continued) or reintroduced (shifted) contexts.

Referential expressions	**Continued contexts**	**Shifted contexts**	**Total**
DPs	22% (81)	78% (288)	100% (369)
Pronouns	41% (94)	59% (136)	100% (230)
Null arguments	84% (886)	16% (170)	100% (1056)
Total	64% (1061)	36% (594)	100% (1655)

Chart 11. Proportion of nominal expressions, pronominal expressions and null arguments with respect to their continued or shifted contexts.



The data on pronominal forms in LIS correlates with expectations, which were formed on the basis of previous studies in both spoken and signed languages (Prince 1981, Ariel 1990, 1991, 2013, Gundel 2003, Gundel et al. 2019, Perniss & Özyürek 2014, Czubek 2017). Indeed, pronouns occupy a mid-position between referential expressions used for encoding both low and highly accessible information. In reintroduced contexts, information is meant to be less prominent, and therefore requires fuller informative expressions, such as DPs. In contrast, in maintained contexts the referential expressions codify salient information, so as to license their omission. Despite the intermediate position of pronominal referential forms, it is important to note that a difference between the two types of context arises, thus making indexical elements more frequent in shifted contexts than maintained contexts (the asymmetry is equal to 10% of the data

concerning pronouns). The fact that indexation is prominently used in cases of reintroduced entities was also statistically confirmed by the test carried out in the previous section (§ 6.2.1) on the correlation between the overt realizations of referents and null elements. This test significantly showed that pronominal elements, along with nominal expressions, play an important role in reintroducing referents into the discourse.

Another important topic to address regarding pronominalization is the use of prosodic markers accompanying indexical forms. As shown for DPs in the previous section, referents realized as DPs are more frequently accompanied by non-manuals than referents realized as pronouns. This asymmetry between nominal and pronominal arguments can be explained through phonological and pragmatic reasons. Phonologically, due to the short duration of pronouns, it is reasonable that the complete realization and the clear alignment of prosodic markers with pronominal items would be more difficult for signers. Indeed, these elements are held by signers for a very short amount of time and may affect the intonational contour accompanying these forms. On the other hand, it is pragmatically possible to consider non-manual markers as devices which facilitate the retrievability of a constituent for the addressee. In this vein, pronouns are prototypically highly salient elements in the discourse (see Brunetti 2009 for other types of prototypical topics). Therefore, for reasons of economy, we may expect the absence of markers in their realization, especially if we consider the pragmatic function of some non-manual markers, such as squinted eyes which serve as a prosodic cue for retrieving non-accessible information. The comparison between non-manual markers accompanying DPs and pronouns is reported in the table (39) below:

Table 39. Prosodic markers accompanying the realization of nominal and pronominal referential expressions.

Referential expressions	**Raised eyebrows**	**Squinted eyes**	**Eye blink**	**Head-nod**
DPs	26% (97/369)	43% (160/369)	25% (93/369)	21% (79/369)
Pronouns	20% (46/230)	14% (33/230)	13% (31/230)	6% (14/230)
Total	24% (143/599)	32% (193/599)	20% (124/599)	15% (93/599)

The asymmetry among markers accompanying nominal and pronominal forms is evident in the table above, in which non-manual markers display a large discrepancy, especially for squinted eyes, eye blink and head nod. Importantly, the short duration of pronominal expressions does not prevent eye blink, since they are boundary markers

and not domain markers (see § 4.2.2 for further details about prosodic boundary markers). Beside these markers, however, LIS has another marker which seems to predominantly accompany referential expressions encoded as pronouns: the head tilt back. This marker arises with a pronominal form in 13% of the cases (30/230) and does not seem to be regularly combined with other referential expressions.

In order to test the significance of these occurrences, the previous mixed-effect logistic regression model was readapted. Again, omitted topics were excluded from the corpus and only the overt realization of referents was taken into account (LIS3= 599 items). The null hypothesis (H_0) was that no correlation exists between the non-manual marker of backward head tilt and the realization of topics as pronouns. In contrast, the alternative hypothesis (H_1) supported the existence of a correlation. The results show that the possibility of having a backward head tilt as a marker for a pronominal expression is 13 times higher than the possibility of having this marker in occurrence with nominal items (*odds ratio* 12.67, $p<0.01$). The established model and the results are presented in the Appendix, Picture (133).

We can therefore conclude that, despite the reduced function of prosodic markers with respect to pronominal expressions, these elements display a specific non-manual strategy: the head tilt back. The presence of this marker has never been detected before in LIS, and further studies are required in order to test its linguistic value and investigate a potential pragmatic function.

6.2.3 Null arguments in LIS

The significant number of null arguments employed as referential strategies in the dataset (64%) suggests the possibility that this syntactic category appears more frequently in Italian Sign Language. However, such a large quantity of data requires more thorough investigation, since not all the null arguments may be grouped as a unitary class of referents in terms of informational status. Indeed, as in spoken languages, referents can be omitted depending on the linguistic context and the linguistic conditions within which they occur. In particular, the sub-classification of these linguistic conditions in LIS relates to cross-linguistically widespread strategies, such as the types of verb, and to modality-specific strategies, such as the presence of classifier verbs and role shift.

Moreover, if we consider that the visual modality is likely to present multiple pieces of information simultaneously produced through the encoding of their relations in space, then referential expressions may co-occur together. This observation calls for a further classification of null arguments, resulting in a subdivision which takes into account

more referential strategies brought together by the lack of an overt referential expression. The common absence of an overt argument is the reason why, unlike previous studies in other sign languages (Federiksen & Mayberry 2016; Czubek 2017, Ahn 2019 for ASL), such referential strategies have been grouped and analysed as part of a larger class of null arguments.

Following the definitions of the verb types presented in § 2.3.4.1.3 and briefly repeated here, the current study focuses on agreeing and plain verbs, classifier verbs, and role shift. Agreeing verbs are intended as a macro-class which groups together verbs that can spatially agree with an argument or a location. Although the debate on the existence of the so-called categories of agreeing and plain verbs is still open, and some scholars have also discussed the possibility of agreement in plain verbs (Neidle et al. 2000), agreement is generally realized through the use of a directional movement towards a specific locus within the signing space. In contrast, plain verbs have been defined as verbs which do not display inflectional features and, therefore, do not agree with other elements in space (Padden 1990, Meir 2002). Furthermore, some theories have proved that sometimes the same verbs may be hybrids realized both as agreeing and plain verbs depending on their context of usage (Oomen 2018). For the purpose of the current research, agreement features were only considered when overtly realized. Classifier verbs include both verbs with entity classifier handshapes and handling classifier handshapes (Benedicto & Brentari 2004 for ASL; Mazzoni 2008 for LIS). Indeed, in the literature, both types of classifier, namely, semantic and handle classifiers, may serve this predicative function. Therefore, both are considered together in this category. Classifier verbs that do not display movement or agreement, but still contain iconic handshapes reflecting one of the referents, have been included in the study (see Example 242 below).

Finally, role shift is defined as those cases in which the signer assumes the mannerism, action and physical attitude of the described referent. This strategy can occur in isolation, enriching the realization of the verbal item, but it can also occur in combination with other referential strategies. For the sake of clarity, in the following study, only cases of isolated role shift combined with verbs are considered. These strategies are expected to arise in well-defined contexts, in which the referent denoted by the role shift is easily retrievable. Therefore, these elements are generally considered as less informative referential strategies (Frederiksen & Mayberry 2016, Czubek 2017). The remaining properties of role shift appearing in combination with other referential elements are left aside for future investigations.

As is also stated in the methodology (§ 3.4), the possibility of the co-occurrence of multiple referential strategies requires taking into consideration cases in which agreeing

verbs occur with classifier verbs. This category is therefore considered as separate, since it displays cases of predicative classifiers which also present overt agreement features.

Examples of each verbal category are provided below: in (239) two cases of combinations between a classifier verb and an agreeing verb (pr.class.+ agr.); in (240) an example of an agreeing verb; in (241) a plain verb; and in (242) a classifier verb. Finally, in (243) an instance of role shift is provided.

predicative class.+ agr. predicative class.+ agr.

(239) $Ø_x$ **CL:LUGGAGE_TAKE** / $Ø_x$ **CL:$_x$GET_INTO_THE_TRAIN$_y$**

'(The man) takes the luggage, (he) gets into the train'.

[Fi_st1_52-53]

CL:LUGGAGE_TAKE CL:$_x$GET_INTO_THE_TRAIN$_y$

Figure 118. '(The man) takes the luggage, (he) gets into the train'.

agreeing verb

(240) $CL_{2pl\text{-}x}$:SIT / $Ø_x$ **DISAPPEAR**

'The two of them take a seat, and disappear'. [Mi_st_39-40]

CL_{2plx}:SIT DISAPPEAR

Figure 119. 'The two of them take a seat, and disappear'.

plain verb

(241) $Ø_x$ **WHISTLE**

'(The bear) whistles' [Ga_mo_87]

Figure 120. WHISTLE

predicative classifier

(242) DOG LITTLE WAKE_UP / CL:LOOK_AT / CL: RUN / **CL:BARK**

'The little dog wakes up, looks at (the bear), runs and barks'

[Ga_mo_89-92]

Figure 121. 'The little dog wakes up, looks at (the bear), runs and barks'

role shift

(243) $BEAR_x$ CL:SEE / $Ø_x$ SAY_NO / $Ø_x$ **RUN**

'The bear sees him, (he) says no, he runs.

[Ma_mo_24]

Figure 122. 'The bear sees him, (he) says no, he runs.

These findings show that, among the described strategies, the most frequent are (i) the combination of classifier verbs with agreement features, which occur in 29% (487/1056) of the total sum of data, (ii) agreeing verbs, occurring in 16% (261/1056) of cases, and

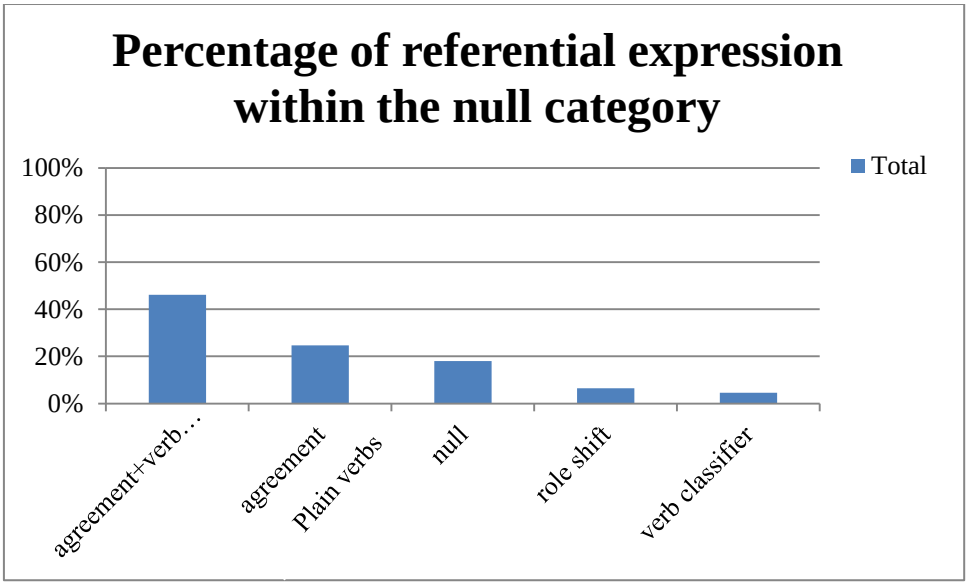
(ii) plain verbs, which appear in 12% (191/1056) of the total number of referential expressions.

The table (40) and the chart (12) below display the distribution of these elements with the null arguments category and the different percentages with respect to the total amount of data and to the argument 'null category':

Table 40. Percentages and count of referential strategies which occur with null arguments.

Types of referential expressions occurring with null arguments	**Count of total numbers**	**Percentage with respect to the argument 'null category'**	**Percentage with respect to the overt expressions**
Agreement + classifier verbs	487	46%	29%
Agreement	261	25%	16%
Plain verbs	191	18%	12%
Role shift	69	7%	4%
Classifier verbs	48	5%	3%
Total	1056	100%	64%

Chart 12. Graphical representation of the distribution of referential strategies belonging to the class of null arguments.



As expected, if we consider the distribution of referential expressions belonging to the null category with respect to their informational status as continued or shifted

references, this data presents a strong preference of these categories as strategies mostly occurring in maintained contexts. As a matter of fact, 84% of the data is employed in maintained contexts. The following table better displays this scenario.

Table 41. Types of referential expression licensing null arguments in both shifted and continued contexts.

Types of referential expression occurring with null arguments	**Continued contexts**	**Shifted contexts**	**Total with respect to the other data**
Agreement + Classifier verbs	81% (394)	19% (93)	100% (487)
Agreement	86% (225)	14% (36)	100% (261)
Plain verbs	91% (174)	9% (17)	100% (191)
Role shift	77% (53)	23% (16)	100% (69)
Classifier verbs	83% (40)	17% (8)	100% (48)
Total	84% (886)	16% (170)	100% (1056)

As presented in the table above, the quantity of referential strategies occurring as cases of reintroduced referents is negligible, except for role shift and the combination of classifier predicates with agreeing verbs, which occur in 23% and 19% of cases respectively as a referential strategy for reintroducing entities into the discourse. Moreover, the extremely small percentage of classifier verbs and role shift occurring alone signals the limited influence that these elements have as isolated referential expressions within discourse contexts. This is probably because these elements are mostly used in combination with other referential strategies, such as classifier predicates. More research is required, however, in order to better understand this phenomenon.

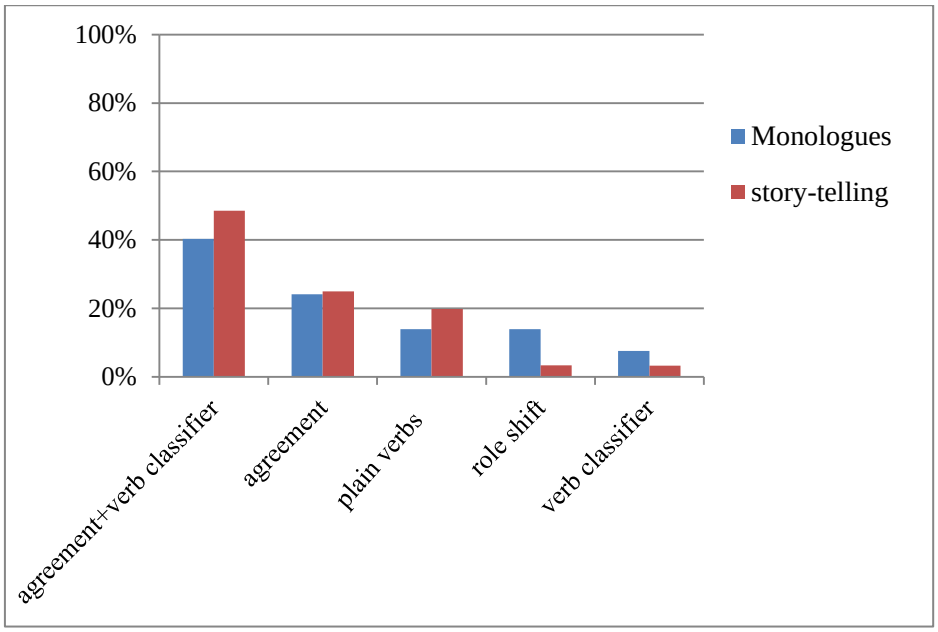
As for the relationship between referential expressions occurring in the null categories and the two different types of data (Story-telling and Monologues), the Story-telling data seems to display a significant quantity of these referential strategies, as shown in the table (42) and the chart (13) below:

Table 42. Distribution of referential expressions with respect to the Monologues and the Story-telling.

Types of referential expression occurring with null arguments	**Monologues**	**Story-telling**	**Total with respect to the other data**

Agreement + classifier verbs	40% (127)	49% (360)	46% (487)
Agreement	24% (76)	25% (185)	25% (261)
Plain verbs	14% (44)	20% (147)	18% (191)
Role shift	14% (44)	3% (25)	7% (69)
Classifier verbs	8% (24)	3% (24)	5% (48)
Total	100% (315)	100% (741)	100% (1056)

Chart 13. Distribution of referential expressions occurring in null categories with respect to the two types of data: Monologues and LIS Story-telling.



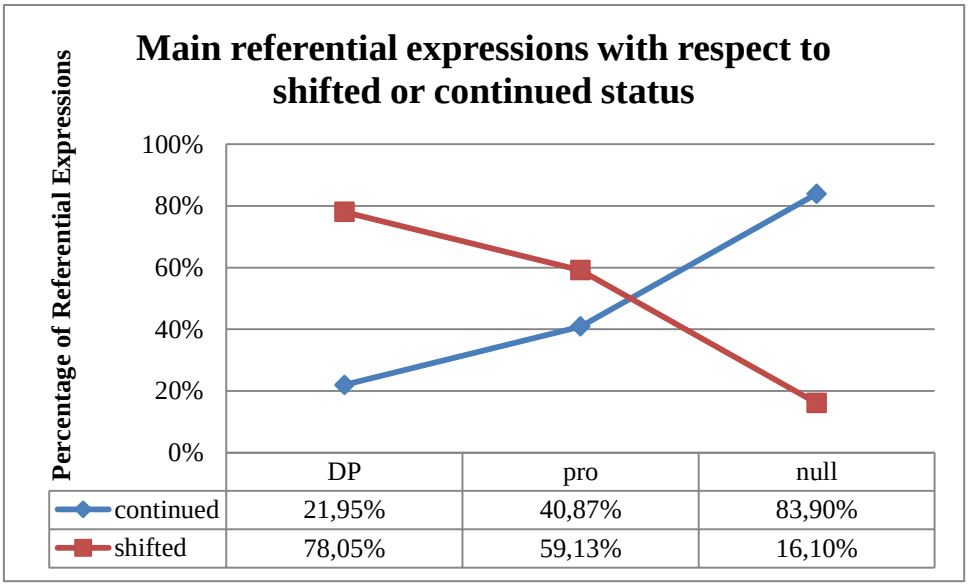
The small discrepancy in favour of the Story-telling data is owing to the combinations of classifier and agreeing verbs, and agreeing and plain verbs. This may be due to the major complexity of the story-line, which perhaps enhanced the number of referential expressions required.

We can conclude that referential strategies allowing the omission of an argument are frequently used in LIS, and that many subcategories of classes exist. The internal variation of these linguistic forms occurring with omitted arguments is ranked from 77% to 91% in continued contexts and from 9% to 23% in reintroduced contexts. In the following section, the referential expressions addressed here are analysed in relation to their categorical distribution across a referential scale based on their informational status.

6.2.4 Referential Hierarchy in LIS

The preference towards the syntactic categories encoded in reintroduced and maintained referents, which have been discussed above, are better understood by looking at the data. Indeed, as was already shown in the previous section (§ 6.2), 78% of nominal expressions are employed in cases of reintroduced referents, while 84% of null arguments are allowed in cases of a maintained referent. Pronouns occur in a mediating position and may be employed in both maintained (41%) and reintroduced contexts (59%).
A summarizing chart displaying these proportions is provided in (14) below:

Chart 14. The occurrence of the main categories of referential expressions with respect to their reintroduced (shifted) or maintained (continued) status in the discourse.



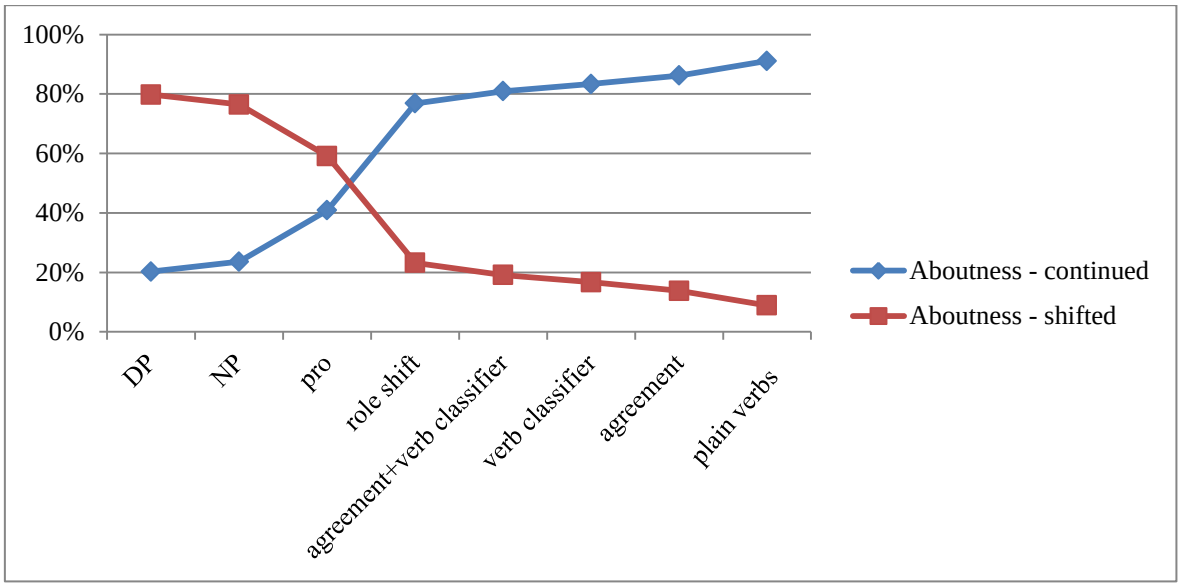
After a more detailed analysis, it is possible to sketch a detailed graph in which the sub-categories of referential expressions taken into consideration in § 6.1 are also included. In this case, from the relationship between the referential expressions and their reintroduced and continued contexts, a more precise scenario emerges and is reported in the table (43) and the chart (15) below.

Table 43. The occurrence of the sub-categories of referential expressions employed in shifted or continued discourse contexts.

Types of referential expression occurring with	**Continued contexts**	**Shifted contexts**	**Total of each row**

null arguments			
Determiner Phrases	20% (36)	80% (142)	100% (178)
Nominal Phrases	24% (45)	76% (146)	100% (191)
Pronouns	41% (94)	59% (136)	100% (230)
Role shift	77% (53)	23% (16)	100% (69)
Agreement + Classifier verbs	81% (394)	19% (93)	100% (487)
Classifier verbs	83% (40)	17% (8)	100% (48)
Agreement	86% (225)	14% (36)	100% (261)
Plain verbs	91% (174)	9% (17)	100% (191)
Total	64% (1061)	36% (594)	100% (1655)

Chart 15. The occurrence of each analysed category of referential expressions with respect to their reintroduced (shifted) or mantained (continued) status.



The chart above provides a visible demonstration of the distribution of the behaviour of each of the specific referential strategies employed in LIS, confirming the main preferred tendencies shown before. This integration, however, has better defined the relationships of some sub-categories, such as the relationships between DPs and NPs, and the internal distribution of the null sub-categories. The data seems to confirm that complex nominal expressions, which have a determiner, are more informative than bare noun phrases. Therefore, despite the slight discrepancy, noun phrases can be considered more accessible than full determiner phrases. Indeed, this is also in line with the theoretical suppositions for spoken languages (Prince 1981, Ariel 1990, 1991, Lambrecht 1994, Gundel et al. 2019).

Pronominal expressions, as in the previous analysis, occupy a medial position allowing their usage with both maintained and reintroduced referents, although they seem to prefer contexts of anaphoric reintroduction.
The data also displays the categorical distribution of the different types of null categoriy, showing small variations among each of the referential conditions considered. It was hypothesized that signers might employ such different types of null arguments in a different way with respect to the discourse status.

Despite their predominant function in maintained contexts, role shift, the combination of predicative classifiers and agreeing verbs, classifier verbs, and agreeing verbs in LIS are also employed with slight variations in case of reintroduced referents. A similar scenario leads us to consider these four referential tools as those which are more fully informative. Indeed, their informative nature is understandable if we consider the greater referential value of each of these tools. They can convey additional cues for making the retrievability of the omitted referent easier. Role-shift (for example the physical shift in the locus of the signing space where a referent was placed), may function as a signal for retrieving the referential identity. Moreover, the signer's body and facial expressions may also provide additional information about the entity under discussion, facilitating, in the process, the retrievability of the referent. The example below displays one such situation, in which the referent is a man who fights a monster. He is clearly identified by the expression assumed by the signer in imitating his face.

(244) $Ø_y$ CL:RUN/ / $Ø_x$ CL:BITE / $Ø_y$ **PUSH_AWAY**
'(The man) runs, (the monster) bites him, (the man) pushes (the monster) away'.
[Fa_st6_92-94]

Figure 123. '(The man) runs, (the monster) bites him, (the man) pushes (the monster) away'.

Similarly, predicate classifiers make retrievability easier thanks to the information conveyed by the handshape of such a verb. Indeed, handshapes select a class of entity by referring to characteristics which are common among that class's members. This

may enhance the possibility of retrieving the omitted referent. See the example below, in which the small dog is clearly identified by the specific U handshape. In this case, although the sentences below were rotating around other referents, the shifted referent DOG is easily retrieved by the presence of the predicative classifier.

(245) THERE_IS BONE/ THERE $Ø_x$ CL:TAKE/ $Ø_x$ SHOW_THE_BONE /
__pred.classifier
$Ø_y$ **CL:MOUTH-OPEN**
'There is a bone, there, (the bear) takes it, (he) shows it, (the dog) opens his mouth'.

[Ma_mo_58-61]

Figure 124. 'There is a bone, there, (the bear) takes it, (he) shows it, (the dog) opens his mouth'.

Agreeing verbs, as pointed out in § 2.3.4.1.3, encode referential information since they may be directed towards a locus in the signing space, indicating the argument that was previously realized in that locus. The syntactic properties embodied by space in LIS allow the omission of referents and keep them retrievable. An example extracted from the LIS data sets displaying a case of a null argument with an agreeing verb employed in a shifted context is presented below.

(246) JOB LOOK_FOR / ASK_x / IX-3_x SAY_NO / REFUSE /
agreeing verb
GO RESTAURANT…
'(The man) looks for a job, (he) asks a man who says no and refuses him, then he goes towards a restaurant'.

[Na_st6_32-36]

Figure 125. '(The man) looks for a job, (he) asks a man who says no and refuses him, then he goes towards a restaurant'.

These referential properties are enhanced when one of these strategies is combined with others, as in the case of predicative classifiers being combined with agreeing features. In such situations, the referential value is heavier than the value of the two single strategies. In fact, in the referential scale, such combinations of predicative classifiers also showing agreeing properties (pred. class+agr) precede the isolated instance of predicative classifiers and agreeing verbs. An example is reported below:

pred.class+agr

(247) CL:be_at$_x$ WOMAN /// IX-3 MAN WRITE/ Ø$_x$ MONEY **CL:$_1$GIVE$_x$**
'The man writes, (he) gives (her) the money'.

[De_st5_5,9-10]

Figure 126. 'The man writes, (he) gives (her) the money'.

Plain verbs, on the other hand, are less informative referential strategies and, for this reason, they occupy the final position of the scale in LIS. Indeed, such results fit perfectly with the fact that these verbs do not contain any additional information in order to easily retrieve the referential entity in discussion. Therefore, it is assumed that the omission of the referent in cases of plain verbs may be licensed only on the basis of its extremely salient informational status. An example of plain verbs in a case of maintained context is provided below:

(248) DAUGHTER$_x$ CL: EYE_OPEN / Ø$_x$ BED_GET_OUT / Ø$_x$ HAVE_BREAKFAST /
plain verb

$Ø_x$ **PREPARE**

‘The daughter opens her eyes, gets out of bed, has breakfast, prepares herself’.

[La_st1_37-40]

Figure 127. ‘The daughter opens her eyes, gets out of bed, has breakfast, prepares herself’.

The distribution of referential expressions with respect to their shifted or continued status confirms general tendencies also investigated in spoken and sign languages. Indeed, in maintained contexts, the omission of referents is preferred. In contrast, in reintroduced contexts, the signer prefers the overt realization of referents, and, above all, nominal expressions.

Despite this, however, each referential form occupies a specific placement in the hierarchy, displaying a specific behaviour with respect to the discourse contexts of usage and types of data set. In the following section, the referential expressions addressed in this section are analysed in relation to their distribution across a referential scale based on their level of activation.

6.3 Accessibility and communicative strategies in LIS

In line with the previous studies on oral and sign languages addressed in § 2.2.4 and § 2.3.4, LIS also displays an array of referential expressions that are selected depending on the informational status of the referent supposed by the signer within a conversation. As shown in the previous section, the findings display a general tendency aligned with the principle of economy on the basis of which signers prefer fuller informative forms, such as nominal expressions and pronouns, as tools for reintroducing less salient referents into the discourse. In contrast, in cases of prominent information, signers adopt a wide range of linguistic strategies which allow the omission of the referent, taking advantage of linguistic contexts such as the type of verb, or the information encoded by language-specific tools, such as predicative classifiers or role shift. This information permits the easy retrievability of entities, avoiding useless repetition, which could be responsible for making the discourse redundant.

The criterion used, however, is not adequate for testing the accessibility status of all the referential constituents, and, indeed, this method does not discriminate between reintroduced referents, which may be either close or far away from its antecedent. Therefore, additional measures are required in order to better analyse the accessibility of different referential items and return a more complex picture of the referential system in LIS.

In order to address these methodological issues, two new criteria have been considered in the analysis of the data: the number of competitors occurring between the antecedent and its anaphoric form, and the number of sentences which separate a previously mentioned entity from its reintroduction. In so doing, we intend to better account for the accessibility conditions of a referent by comparing all three analytic tools.

The next sections are composed as follows: § 6.3.1 provides a first analysis of the accessibility in LIS by considering the distance between each antecedent and its anaphoric resumption and the number of competitors which arose within this distance; § 6.3.2 provides further evidence to confirm the pragmatic functions of the specific marker of squinted eyes as a cue involved in the retrievability of constituents. Finally, § 6.3.3 intends to point out the challenges and methodological issues which have remained opened, in order to address these topics in future studies.

6.3.1 A first analysis of accessibility in LIS

Previously shown findings are useful for better addressing the informational status that each referential category attempts to syntactically encode. The criteria through which such information is annotated, however, is dichotomous, as already pointed out in the methodology (§ 3.4.3). Indeed, continued contexts are those in which a referent is consistently and sequentially used across more than one adjacent sentence. On the other hand, shifted contexts refer to entities which have been reintroduced into a sentence independently from their distance to the previous mention of the referent. In fact, such a measure groups both the long and short distances occurring between the antecedent and its anaphora into one label, without making any distinction. Therefore, similar analyses may be imprecise with respect to the distinct uses of a narrow or broad anaphora and, consequently, with respect to a more detailed picture of the referential accessibility. With the aim of solving this issue, sentential distances and the number of competing references which appear in between the antecedent and its anaphoric reintroduction are considered.

As already introduced in § 2.2.4.2, sentential distance is one of the factors which may affect the accessibility and reactivation of a referent in the mind of the interlocutor. Indeed, it consists of the number of sentences that elapse between the last mention of an entity in the discourse and its subsequent anaphoric resumption. Depending on the number of sentences between the antecedent and the anaphoric expression, the retrievability of the entity in discussion is either facilitated or not. Therefore, an entity which is resumed after two sentences is supposedly more likely to be easily retrieved by the addressee than one mentioned several sentences before its resumption.

An example of a short distance that elapses between an antecedent and its anaphoric expression is reported below (249). The entity referred to is the bear. It is reintroduced in sentence n°72 and remains salient across six sentences (73-78). Then, it is separated from its close reintroduction in sentence n°80 by the first mention of an inanimate objects: the bone (sentence n°79). In sentence n°81 the little dog is reintroduced and kept salient for one sentence (n°82). In sentence n°83 the bear is again reintroduced as a nominal expression. This process shows how entities are managed and reintroduced through anaphoric resumption in cases of a short distance across sentences. For clarity, the referent is highlighted in bold:

(249) […] **BEAR** CL: LAY_DOWN $_{72}$/ **Ø** TAKE BANANA $_{73}$/ **Ø** THROW_AWAY $_{74}$/ **Ø** CL:

sq

STAND_UP $_{75}$/ **Ø** CL: WALK $_{76}$/ **Ø** CL:TRASH_CAN RAISE $_{77}$/ **Ø** CL: TOP_OPEN $_{78}$/

sq sq

THERE_IS BONE $_{79}$/ **Ø** CL: LOOK_AT $_{80}$ / LITTLE DOG FARAWAY SLEEP $_{81}$ / Ø SNORE $_{82}$ / **BEAR** CL: LOOK_AT $_{83}$ […]

'[…] T**he bear** lays down, takes off the banana (from his face) and throws it away, then (he) stands up and walks. (He) raises the trash can and opens the top. There is a bone, **(he)** looks around, the little dog is sleeping far away, snoring. The bear looks at him […]'

[Ga_mo_72-83]

In contrast, an example of a longer distance is provided below in (250). In this case, the entity referred to, the bird, after a first introduction, is maintained salient across two sentences, and then reintroduced after 24 sentences. Across these 24 sentences other entities are introduced and function as an aboutness topic. For sake of clarity, the entity in question is highlighted in bold and accompanied by the specification of its informational status.

First introduction maintained

(250) **THERE_IS BIRD WINGS** TYPE PAPER $_{25}$/ **IX-3** NAME ORIGAMI $_{26}$/ REMEMBER
maintained
$_{27}$/ FOLD **BIRD** CL:WINGS $_{28}$/ Ø (the man) TAKE WHERE $_{29}$/ HAT CL: be_at $_{30}$/ STOP $_{31}$/ Ø PUT INSIDE LUGGAGE $_{32}$/ CLOSE $_{33}$/ LUGGAGE TIME OLD BEFORE REMEMBER $_{34}$/ LUGGAGE BUCKLE Ø TAKE $_{35}$/ WIFE LOOK_AT SAD $_{36}$/ DAUGHTER EYE_OPEN $_{37}$/…./ DAD
reintroduced
DAUGHTER HAT TAKE_OFF $_{51}$/ **CL: BIRD_OVER_THE_HEAD PE BIRD ORIGAMI** DAUGHTER TAKE $_{52}$/…

'There is a **bird** with wings made of paper, **it** is known as origami, do you remember? A **bird** with its wings folded. He (the man) takes it, where? In the hat over the head. Stop. He (the man) puts his stuff inside the luggage and closes it. The old-fashioned luggage, do you remember it? He (the man) takes the luggage with the buckles. The wife looks at him sadly. The daughter wakes up. [...] The dad takes off his hat in front of the daughter. As for **the origami, the bird** which was over his head, she takes it.'

[La_st1_25-52]

Another factor influencing the accessibility of a previously mentioned entity, as anticipated in § 2.2.4.2, is the number of competitors that occur within the distance between the antecedent and the anaphoric expression. It consists of the presence of other referents occurring within the same frame of discourse. This presence creates a competition in the mind of the addressee by weakening the saliency and prominence of the entity under discussion. Indeed, an increase in the number of competitors in the discourse may correspond to a decrease in the retrievability of the referent that is later resumed by the speaker. The number of competitors and the number of sentences occurring between the introduction point of a referent and its resumption may be correlated.

An example of the presence of competitors is displayed below, where the entity under discussion, the man, is separated from its anaphoric resumption in sentence n°18 by the presence of two introduced entities, another person and a child. In this case, proximity to its antecedent, present in sentence n°15, allows the reintroduction of the anaphoric referent after two sentences through the omission of the subject. The agreeing verb ASK is clear enough in retrieving the identity of the referent under discussion.

(251) […] LATER **Ø (the man)** LET IT $_{13}$/ **Ø** LOOK_AROUND $_{14}$/ **Ø** CL:BOX_PUT WHERE $_{15}$/ PERSON$_x$ ARRIVE $_{16}$/ PE IX-3$_x$ TOGETHER IX-3$_y$ CHILD$_y$ CAME $_{17}$/ **Ø (the man)** ASK$_{x\text{-}y}$ $_{18}$/ SHEET INDICATE $_{19}$/ […]

‘Later, **he (the man)** leaves it and looks around. **He** did not know where to put the box. A person arrives and a child comes together with this person. **The man** asks a question to them and indicates the sheet’.

[Fi_st7_13-19]

Before presenting the results of the analyses, some data are provided in order to offer a clearer understanding of the model. By looking at the sentential distance, which was annotated by considering the number of sentences that elapsed between a referential antecedent and its anaphoric resumption, data from the Story-telling displays a range from 0 to 639 sentences, while data from the Monologues shows a shorter distance range from 0 to 37. On the other hand, competitors ranged from 0 to 59 in Story-telling and from 0 to 5 in Monologues. The following table displays this split between the two types of data.

Table 44. Range of distance, range of number of competitors, and calculation of their average respectively occurring in Story-telling and Monologues.

Type of data	**Distance**	**Average of the distance**	**Number of competitors**	**Average of competitors**
Story-telling	0-639	8.9	1-59	0.9
Monologues	0-37	2.4	1-5	0.4

An analysis was carried out to consider the main categories and the average values of sentential distance, as well as the average of the number of competitors. The table below describes such values: (45) the sentential distance and (46) the number of competitors that elapsed between the antecedent and its anaphora.

Table 45. Average of the sentential distance occurring between an antecedent and its anaphoric referent with respect to the main referential categories in the total data.

Referential Expressions	**Average of Sentential Distance**
Nominal Expressions	20.18
Pronouns	8
Null Arguments	2.36
Total	7.00

Table 46. Average of number of competitors occurring between an antecedent and its anaphoric referent with respect to the main referential categories in the total data.

Referential Expressions	**Average of Number of Competitors**
Nominal Expressions	2.33
Pronouns	0.90
Null Arguments	0.20
Total	0.80

It is interesting to note that the analysis confirms the hierarchy which was presumed in the literature of both spoken and sign languages (Prince 1981, Ariel 1990, 1991, Lambrecht 1994, Gundel et al. 2019, Perniss & Özyürek 2014, Frederiksen & Mayberry 2016, Czubek 2017). Nevertheless, from a more detailed observation of the distribution of such values, only sentential distancse ranging between 0 and 15 occurred frequently in the data, since, after this many sentences, the referential occurrences became an exception. Similarly, only 6 competitors frequently divided an antecedent from its anaphoric reference, and superior values only occurred as outliers. Therefore, in order to better preserve the accuracy of the analysis, another strategy was used, and the data were cleaned up by removing the values outside this established range. The same analysis was conducted and applied to the main categories, displaying the average values of sentential distance and the number of competitors. The table below describes these values: (47) the sentential distance and (48) the number of competitors in the cleaned-up data.

Table 47. Average of the sentential distance occurring between an antecedent and its anaphoric referent with respect to the main referential categories.

Referential Expressions	**Average of Sentential Distance**
Nominal Expressions	3.30
Pronouns	3.00
Null Arguments	1.60
Total	2.10

Table 48. Average of the sentential distance occurring between an antecedent and its anaphoric referent with respect to the main referential categories.

Referential Expressions	**Average of Number of Competitors**

Nominal Expressions	0.70
Pronouns	0.50
Null Arguments	0.15
Total	0.30

The categorical order has been respected, despite the lower range of values in the balanced data. We did not test the statistical significance of the correlation between the distance, the number of competitors, and the realization (or other factors), due to the complex nature of the data. If we were to consider the whole dataset, we would have many outliers that would violate model assumptions. If we were to remove the outliers for modelling, we would lose the insight that such outliers demonstrate a consistent pattern, namely, the use of nominal expression co-occurring with the marker of squinted eyes (see next section § 6.3.2).

These analyses have also been conducted with respect to two different data sets: the monologues and the LIS Story-telling. This was done in order to understand if the physical or imaginary presence of an addressee, the number of competitors, or the sentential discourse of the two specific types of datasets, may affect the referential distribution. Table (49) displays the average distance with respect to the main referential categories (nominal expressions, pronouns and null arguments) and the data set (Monologues and Story-telling).

Table 49. The average of the sentential distances with respect to the main referential categories and the data sets in the cleaned-up data.

Referential Expressions	**Monologues**	**Story-telling**
Nominal Expressions	4.15	3.00
Pronouns	2.90	3.10
Null Arguments	1.50	1.60
Total	2.20	2.10

By conducting comparisons within these data, it emerges that, in Monologues, the nominal expressions allow for a greater sentence distance between their antecedent and the sequent anaphoric mention than in Story-telling. The discrepancy is equal to 1.15 and may be explained by the increased complexity of the narrative plot in the Story-telling. Indeed, the presence of many referents may also have affected the contexts of usage in which nominal expressions are employed. On the contrary, the values of the two remaining referential categories do not display any large difference.

By looking at the occurrence of competitors with respect to the data set, the difference between values is slightly lower, but still present, as displayed in the table (50) below:

Table 50. Average of the number of competitors with respect to the main referential categories and the data sets in the cleaned-up data.

Referential Expressions	**Monologues**	**Story-telling**
Nominal Expressions	1.00	0.60
Pronouns	0.70	0.40
Null Arguments	0.16	0.15
Total	0.40	0.30

All three referential expressions in the Monologues displayed a greater number of competitors than in the Story-telling. Again, this could be explained by considering the complexity of the data. The occurrence of competitors between the antecedent and the correspondent anaphora in all three referential categories may in the Monologues have permitted a number of competitors greater than that allowed in the Story-telling. Indeed, this could have been caused by the fact that fewer characters occurred in the Monologues. Their scarcity may have reduced ambiguity problems in retrievability, thus explaining the higher value of competitors.

Finally, a more detailed analysis (which also considers the sub-categories of the referential expressions taken into account) has been conducted on the data, again basing the calculation on their average. It is important to consider that this analysis represents a preliminary attempt to better understand phenomena related to the accessibility of information in LIS and that the results of future analyses may display other scenarios when larger datasets are available. Table (51) displays the sentential distance applied to all referential strategies addressed in the previous section § 6.2, while Table (52) displays the analysis conducted on the number of competitors.

Table 51. The average sentential distance values with respect to the sub-categories of the main referential expressions in the cleaned-up data.

Types of referential expressions occurring with null arguments	**Average sentential distance**
Determiner Phrases	4.29
Pronouns	3.01

Nominal Phrases	2.47
Classifier verbs	1.87
Agreement + Classifier verbs	1.63
Role shift	1.56
Plain verbs	1.49
Agreement	1.48
Total	2.12

Table 52. The average number of competitors with respect to the sub-categories of the main referential expressions in the cleaned-up data.

Types of referential expressions occurring with null arguments	**Average number of competitors**
Determiner Phrases	0.90
Nominal Phrases	0.54
Pronouns	0.47
Role shift	0.20
Agreement + classifier verbs	0.16
Classifier verbs	0.14
Agreement	0.14
Plain verbs	0.12
Total	0.30

If we compare the two tables above, we notice that, although the values regarding the number of competitors reflect the previous referential orders, the sentential distance affects the distribution of referential strategies. In fact, following the data presented in Table (51), unexpectedly, bare nominal expressions show a slightly inferior value compared to pronouns and this is reflected by the average calculation. Moreover, the subcategories allowing the argumental omission display a variation in their order. The class of classifier verbs seems to bear a slightly larger sentential distance than the combination of classifier and agreement verbs. Furthermore, syntactical distance in terms of sentences doesn't seem to deeply discriminate between agreeing and plain verbs, which are almost equal in their values. This scenario leads us to re-think the sub-categorical referential hierarchy with respect to sentential distance. Indeed, if the

average of the number of competitors seems to confirm the previous observations about accessibility, which also hold true for the maintained and reintroduced contexts, the distance influences linguistic expressions and displays a slightly different pattern. This result may attest to the permeability from each single referential expression to a specific accessibility factor. For example, classifier verbs are likely to be employed in contexts with fewer referents than those allowed by role shift, but are stronger in retrieving references across more sentences than role shift.

Similarly, agreeing verbs display a stronger attitude in discerning between referential competitors, but a weaker one in functioning as retrievers, if a large number of sentences separates the agreeing verb from its antecedent.

We can conclude that these two additional criteria provide a better lens for understanding the single behaviour of referential strategies. The comparison between these sub-categories of referential expressions outlines a more detailed picture of how pragmatic contexts and linguistic variables may affect the accessibility of a referent. Of course, it is also important to keep in mind that such variations are small and that a larger quantity of data is required in order to carry out more specific analyses.

6.3.2 Prosodic strategies in marking accessibility in LIS

The statistic test on the realization of nominal and pronominal references carried out in § 6.2 has shown that prosody plays an important role in pragmatic contexts. Indeed, specific non-manual markers seem to function as cues for retrieving less accessible constituents. According to the compositional approach (Sandler 2005), non-manuals are components which can create complex meanings when combined. In some past studies (Dachkovsky 2005, Dachkovsky, Sandler 2009), the non-manual component of squinted eyes has been associated with the retrievability of constituents whose status is negotiated between the interlocutor and the addressee. It marks mutually accessible information, which is not currently prominent in the discourse and has therefore been interpreted as a marker for shared knowledge.

In sketching a more detailed picture of accessibility, the two additional criteria used for analysing the distribution of referential categories are now applied to the prosodic aspects.

Although no significant direct correlation has been found with the statistical test, the results show that, among all referential items extracted from the spontaneous data, those accompanied by squinted eyes mostly correspond to shifted topics (25% of shifted topics were marked by squinted eyes, versus 8% of continued topics).

As already stated in previous sections, shifted topics are the part of the information that is reintroduced into the discourse after a previous mention, and are therefore less accessible than continued topics from the speaker's perspective. From this point of view, continued topics are less marked by squinted eyes or by any other non-manual. This can be explained by the fact that continued topics are already salient in the addressee's mind and do not require any specific cue in order to be retrieved. The majority of referential expressions used with continued contexts can be omitted; as is the case for argumental ellipsis, they are, therefore, not marked by intonational-prosodic contours.

The use of squinted eyes marking both shifted and continued aboutness topics is summarized in Table (53) below:

Table 53. Occurrences of squinted eyes with continued and shifted referential expressions.

Referential expressions	**Squinted eyes**	**Absence of squinted eyes**
Continued	8% (46/175)	22% (129/175)
Shifted	25% (147/424)	46% (277/424)
Total	32% (193/599)	68% (406/599)

By considering the total amount of overt referential expressions (total number of aboutness topic items: 599) with respect to the type of data and the way in which referential expressions are syntactically encoded, the marker of squinted eyes seems to prominently accompany nominal expressions in both Story-telling and Monologues. This preference is visible in the table below:

Table 54. Distribution of squinted eyes with respect to the type of data (Monologues or Story-telling) and to overt referential expressions (DPs or pronouns) in the total amount of overt expressions.

Referential expressions	**Monologues**		**Total of Mon.**	**Story-telling**		**Total of St.**	**Total**
	No-squinted eyes	**Squinted eyes**		**No-squinted eyes**	**Squinted eyes**		
DPs	16% (59)	11% (40)	**27% (99)**	41% (150)	33% (120)	**73% (270)**	**100% (369)**

Pronouns	24% (55)	7% (15)	**30% (70)**	62% (142)	8% (18)	**70% (160)**	**100% (230)**
Total	19% (114)	9% (55)	**28% (169)**	49% (292)	23% (138)	**72% (430)**	**100% (599)**

Similarly, in the cleaned-up data (total number of topic items: 540), the preference for marking nominal expressions with squinted eyes, rather than pronominal expressions, is mantained almost unaltered in both the Monologues and Story-telling data, as displayed in the table below.

Table 55. Distribution of squinted eyes with respect to the type of data (Monologues or Story-telling) and with respect to the overt referential expressions (DPs or pronouns).

Referential expressions	**Monologues**		**Total of Mon.**	**Story-telling**		**Total of St.**	**Total**
	No-squinted eyes	**Squinted eyes**		**No-squinted eyes**	**Squinted eyes**		
DPs	18% (58)	11% (36)	**30% (94)**	42% (132)	28% (90)	**70% (222)**	**100% (316)**
Pronouns	26% (55)	7% (15)	**31% (70)**	62% (138)	7% (16)	**69% (154)**	**100% (224)**
Total	21% (113)	9% (51)	**30% (164)**	50% (270)	20% (106)	**70% (376)**	**100% (540)**

For the purpose of relating this data to a more complex model also able to account for the way the prosodic marker of squinted eyes behaves within accessibility, both the sentential distance between the antecedent and the anaphoric realizations, and the number of competitors that may occur across this distance have been tested with respect to the use of the marker of squinted eyes.

Firstly, we calculated the occurrence of such prosodic markers across sentential distance with respect to both the whole number of overt expressions (items: 599) and to the cleaned-up data (items: 540), excluding in this way sentential distances greater than 16 sentences. As already pointed out in the methodology § 3.4, since the occurrences of referential expressions after that distance were scattered, such data cannot be included in the calculation of averages. Despite this, it is still interesting to consider this part of the data. It seems that the marker of squinted eyes operates in the case of a longer

distance between the antecedent and its anaphoric resumption, while no noticeable effects of distance can be observed when only shorter distances (under 16 sentences) are taken into account (the trend in this data is in fact in the opposite direction: more squints for shorter distances on average). This behaviour is visible if we compare the two charts below. The first chart (16) displays the distribution of the marker of squinted eyes with respect to the distance in the total amount of data, while the second chart (17) shows the same distribution in the cleaned-up data.

Chart 16. Plot of the distribution of the marker of squinted eyes with respect to the distance between the antecedent and the anaphoric resumption, by considering the total amount of data (Distance's range: 0-639).

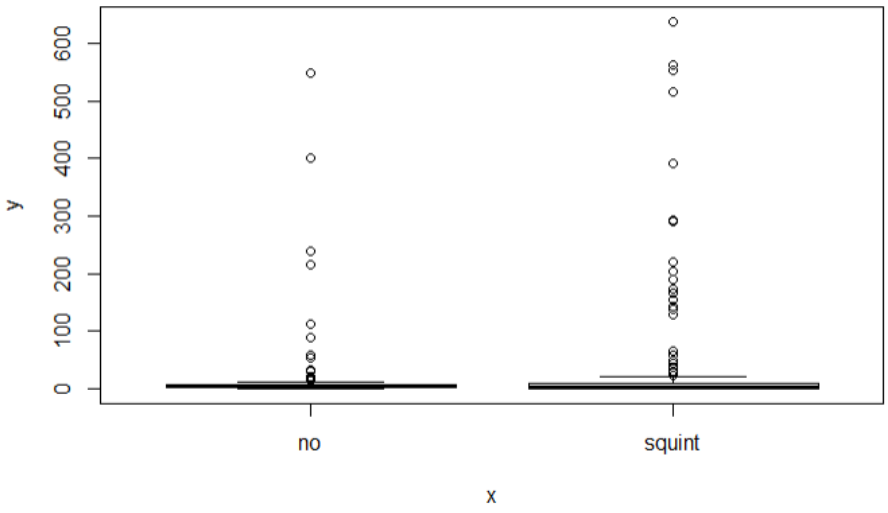
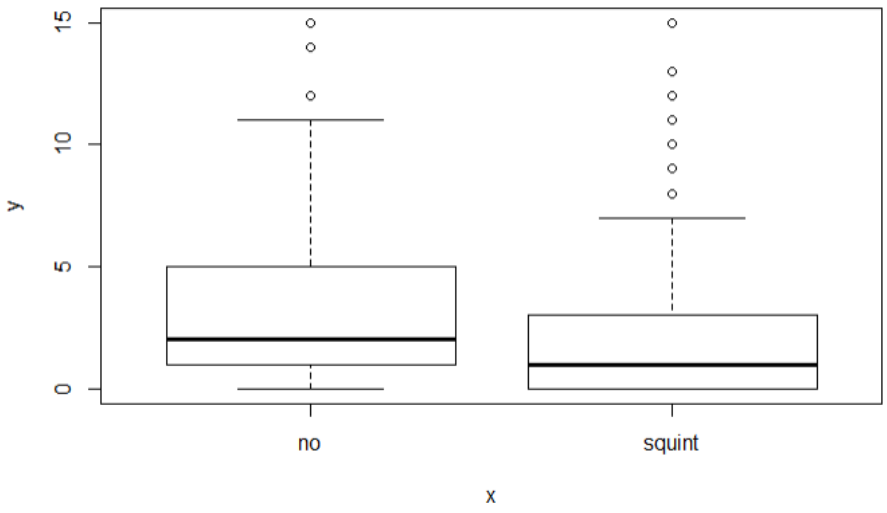


Chart 17. Plot of the distribution of the marker of squinted eyes with respect to the distance between the antecedent and the anaphoric resumption, by considering the cleaned-up data (Distance's range 0-15).



By comparing the charts, the presence of the non-manual marker of squinted eyes increases with an increase of the distance between the antecedent and the anaphora only when longer distances are taken into account, but not when we restrict the range. However, as discussed above, due to the scattered distribution of the full dataset, this result should be taken as a very modest hypothesis that such a difference exists. Indeed, we did not carry out further tests for the statistical significance of the distance in relation to the non-manual marker of squinted eyes, and it is very unlikely to be significant. In fact, these results might have occurred through chance, and a larger quantity of data is required to deduce more about this scenario.

If we analyse the relationship between the presence of the marker of squinted eyes and the number of competitors elapsing between the anaphoric references and their resumption, it is possible to observe a similar trend.

Similarly to the results found on the sentential distance between antecedent and anaphora, the whole dataset indicates that when the number of competitors increases, the occurrence of squinted eyes also increases. Charts (18) and (19) below visually display this distribution, showing the occurrence of squinted eyes with respect to the number of competitors in the total dataset and then in the cleaned-up data.

Chart 18. Plot of the distribution of the marker of squinted eyes with respect to the number of competitors arising between the antecedent and the anaphoric resumption, by considering the total amount of data.

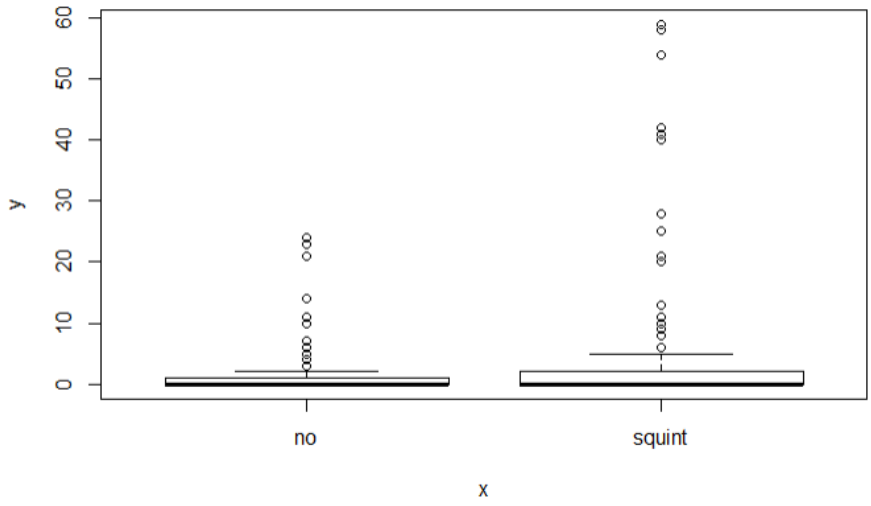
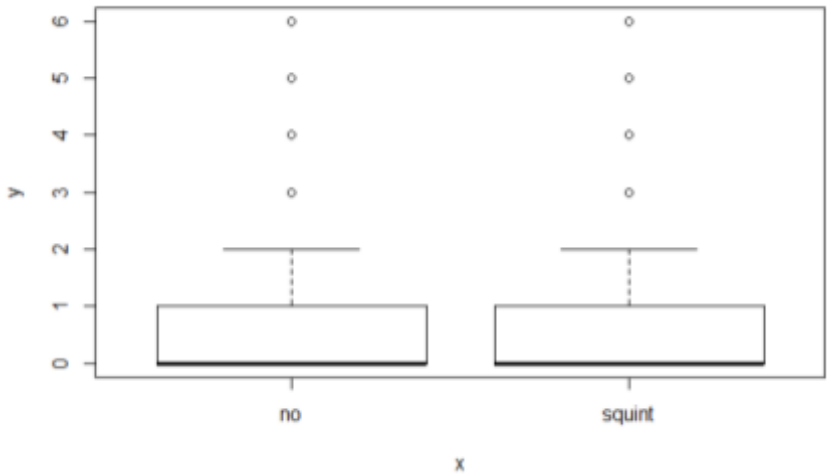


Chart 19. Plot of the distribution of the marker of squinted eyes with respect to the number of competitors between the antecedent and the anaphoric resumption in the cleaned-up data.



The charts show that, if we focus on a limited range of competitors, there is no visible relation between squinted eyes and the number of competitors. However, when we include outliers (large number of competitors), these topics are more likely to be marked with squinted eyes. However, as with the investigation into distance, since we cannot be sure that these results did not arise by chance, the statistical modeling and the significance testing of this observation remains to be completed in future research.

We can conclude that, when analysing the prosodic contour in order to better understand how pragmatic and prosodic functions interact with each other, it is important to take into account additional factors related to accessibility, namely, the sentential distance and the number of competitors. However, due to the small amount of data displaying a distance longer than 15 sentences and a number of competitors greater than 6, it was impossible to carry out a complete statistical analysis of the role of squinted eyes. Although this marker seems to occur most frequently in cases of a very long sentential distance between the antecedent and the anaphora, and a large number of competitors, it is impossible to test the reliability of this hypothesis without a major quantity of data. Therefore, this interpretation is considered a modest indication of a possible trend, but it is left open for further research.

6.3.3 Challenges and unresolved issues

Due to the novelty of this investigation in LIS, many issues have arisen in the analysis of the data and many questions remain open for future research. Several challenges were encountered, from the collection of data to the annotational conventions and the statistical analysis of results. Each stage represents a sensitive portion of the investigation as it affects the findings. For example, in codifying accessibility, a number of critical methodological questions arose, as highlighted in § 3.5, such as the sensitivity

related to annotations. Indeed, sometimes there are situations in which detecting the previous mention of a referent is not a simple task. A representative case may be the occurrence of nominal expressions referring to more than one person, such as collective nouns. In these circumstances, the antecedents which refer to each of the noun-included entities can have different sentential distances and therefore also different numbers of competitors occurring in between. In this case, we decided to consider the furthest antecedent, however the way in which this constituent has been analysed may have affected the results.

From a statistical point of view, it was hard to find a model capable of properly analysing the combinations of all the different factors related to the notion of accessibility. Accessibility, in fact, is difficult to analyse and the investigation of three factors, such as the reintroduced or maintained contexts, the sentential distance and the number of competitors between referents is not necessarily adequate to return a complete picture of discourse-linked dynamics.

With regards to the second challenge, namely the analysis that still remains to be carried out, it is important to highlight that the present research represents a first step in shedding some light on referential topics in LIS. On more than one occasion, the novelty of this research has forced us to restrict the considered variables and to limit the potential of the study. For example, it would be very interesting to make an additional analysis of the sub-categorical differences between semantic and handling classifiers that function as predicative classifiers. Similarly, pronominal expressions have not been analysed with respect to their spatial use. We know from other investigations (Ahn 2019) that pronouns may vary their functions depending on the presence of their spatial anchors. Investigation into the spatial properties of indexical signs need to be addressed in the future.

Furthermore, the analysis of role-shift has only been outlined in the current study, and the use of fixed spatial positions, such as the use of mental rotation in referring to previously mentioned entities, was not considered. Nominal expressions could also be investigated further, for example by adding static classifiers into the analysis. Despite the long list of potential spheres of investigation, however, it is important that similar analyses in LIS have already started and that future research will be able to further improve our understanding of the system of referentiality in LIS.

6.4 Conclusions

The current chapter has analysed the pragmatic status as well as the prosodic and syntactic realization of referential expressions in LIS. In the process, it has shown that LIS follows the accessibility theories outlined for spoken languages (Prince 1981, Ariel 1988, 1991). Despite this similarity with spoken languages, modality specific strategies have been identified. The referential expressions that the signers chose in the two different pragmatic contexts (the Monologues and the Story-telling) reflect the informational status of such elements, encoding the presuppositions of signers with respect to the level of retrievability of the produced information.

In answer to the research question 6.2, the findings in LIS have shown that the prosodic contours which accompany the codification of given and shared information, as well as the pragmatic status of the referent accessibility, are both related to the syntactic encoding of categorical forms, such as nominal andpronominal expressions and null arguments. Specifically, the non-manual marker of squinted eyes accompanies nominal expressions significantly more often than pronominal expressions.

At the same time, findings show that LIS signers have preferences for omitting highly salient entities and encoding as nominal expressions those references which are supposed to be less easily retrievable to the interlocutor. Indeed, signers have been shown to prefer the syntactic codification of reintroduced referents in the form of nominal expressions. These results answer the research question 6.1 about the overt or omitted references and their informational status (other differences have been extensively pointed out in § 6.2). Furthermore, from a theoretical point of view, this relationship seems to confirm the crucial role of syntax in linking prosody and pragmatics.

Finally, by considering the research question 6.3, when analysing shifted or continued transitions, a hierarchical distribution of referential expressions can also be outlined. Counting from the referential expressions mostly involved with shifted contexts to the referential expressions mostly involved with continued contexts, the common distribution is: nominal expressions>pronouns>null arguments.

Therefore, the results in LIS confirm those of previous studies which have been carried out on spoken languages and other sign languages (Prince 1981, Ariel 1990, 1991, Lambrecht 1994, and Gundel et al. 2019 for spoken language, Perniss & Özyürek 2014 for DGS, and Frederiksen & Mayberry 2016, Czubek 2017 for ASL).

A more complex analysis, which also considers the sentential distance and the number of competitors between an antecedent and its anaphoric expression, seems to suggest a further interaction between these factors and the presence of the prosodic marker of squinted eyes. The distribution of scattered data shows that a greater distance and a larger number of competitors seems to increase the possibility of finding the marker of squinted eyes.

In addition, the ability to cross-check more than one factor related to the accessibility of a constituent has allowed us to detect a particular trend regarding the relationship between referential expressions in LIS and the pragmatic contexts in which these expressions are used. As already demonstrated by Czubek (2017), it seems that the referential hierarchy does not display a fixed accessibility value. The signer's choices are ranked depending on the presence of other contextual variables. In so doing, each referent may act differently in relation to its appearance in combination with other referents, or to the presence of a limited or widespread number of competitors or sentences. These results show that LIS employs sophisticated communicative strategies, comparable to spoken languages, taking advantage of dedicated mechanisms available to the visual communicative system.

Despite the large number of unresolved questions, the present research represents a novel contribution to the literature on LIS, by looking at a significant range of referential expressions and providing a verifiable foundation for future research in LIS and other sign languages.

Final conclusions

The present research investigates the prosodic realization and syntactic properties of three types of topics in LIS: aboutness topics, scene-setting topics and contrastive topics, by addressing these phenomena through a multi-theoretical lens. Nine native signers took part in the research and three types of data were considered: two types are spontaneous and display extra-linguistic and structural differences, while a third type of collected data consists of elicited sentences.

Aboutness topics represent what the sentence is about and convey old or shared information between the speaker and the interlocutor. In LIS, this type of topic is commonly accompanied by two specific non-manual markers: raised eyebrows and squinted eyes. Furthermore, all the aboutness topic constituents can be separated from the remaining part of the sentence by two markers which generally signal prosodic boundaries: eye blink and head nod.

These markers were more frequently employed in the elicited data than in spontaneous data, which can be explained by a consideration of the increased level of control over the signer in the elicitation studies as compared with the situation in spontaneous conversations.

Although commonly found, these non-manual markers in LIS are optional and fulfil prosodic functions. In addition, the marker squinted eyes mostly arises in cases of topic reintroduction, and spreads more commonly over nominal expressions than pronominal forms. Therefore, it is possible that in LIS, as in other sign languages, this marker bears a specific pragmatic function, signalling the level of accessibility of the marked referent. By observing the spontaneous data, this marker appears as a cue by means of which the signer advises his interlocutor that the information produced is already present in his mental storage, although no longer prominent.

Scene-setting topics establish the background information within which the main sentence holds. Although debated in the literature, these topics do seem to exist in LIS and convey temporal or locative information which restricts or limits the interpretation of the whole sentence. Similarly to aboutness topics, scene-setting topics are marked by raised eyebrows, and scene-setting topics of location also display a widespread occurrence of squinted eyes. Scene-setting topics of time, however, are less marked than scene-setting topics of location.

Scene-setting topics can also be separated from the remaining part of the sentence by prosodic boundary markers, eye blink and head nod, which may correspond to the pauses detected in oral language after a topic item and signalled by a comma.

A preliminary investigation shows that contrastive topics may be marked by means of both prosodic and syntactic strategies. Prosodically, a spatial rightward and leftward dislocation of the lean co-occurs in the realization of the contrastive items either when they are subjects or objects. Syntactically, a specific manual marker (IN_CONTRAST) mostly arises in cases of a lack of non-manual signals or co-occurring with them, probably with a reinforcement function. Moreover, the contrasted entities can also be placed into two different loci of the signing space, and, in the process, express a contrastive meaning.

Thanks to both spontaneous and elicited sentences the most common distribution of these topic types within the sentence was detected. In line with the findings, scene-setting topics are recursive and frequently occur in the initial part of the sentence, with temporal information preceding locatives. Scene-setting topics are followed by the non-recursive occurrence of aboutness topic items. Contrastive topics are placed lower than scene-setting topics and lower than aboutness topics, therefore, it is possible to sketch an initial syntactic hierarchy among all four types of topic: scene-setting topics of time > scene-setting topics of location > aboutness topics > contrastive topics. This appears to confirm the results carried out in previous studies in both spoken and signed languages (Rizzi 1997, Benincà and Poletto 2004, Kimmelman 2014).

A preliminary test involving strong islands was also carried out in order to better understand the moved or base-generated nature of aboutness topics. The grammaticality judgments of a signer with high linguistic awareness confirmed the hypothesis that these elements are base-generated in the left periphery of the sentence, although further research is required in order to validate this insight.

A final part of this study focused on the complex system of referentiality, namely, it investigated the way in which information is exchanged between signers and interlocutors in order to better understand the management of referents within a natural discourse. For this experiment, only spontaneous data was considered. The results show that there is a preference for the realization of less prominent information in the form of nominal expressions. In contrast, information which is salient across the sentences is generally omitted or reduced to pronominal forms. These findings are in line with the principles of quantity theorized by Grice (1975), and with other studies in both spoken and sign languages (Ariel 1985, 1988, 1990, 1991, 2001, 2013, Givón 1983, 2016, Di Eugenio 1997, Frederiksen & Mayberry 2016, Czubek 2017, Santoro et al. 2017). According to these studies, the referents reintroduced into the conversation are more

likely to be encoded through highly informative expressions, while, by contrast, prominent information is more likely to be omitted or codified through leaner forms, such as pronominal expressions.

Interestingly, when the referential items are omitted from a sentence, other linguistic strategies may co-occur in order to contribute to the correct identification of the referents. Some of these strategies are common to both spoken and sign languages, such as the presence of agreeing verbs or plain verbs, while others are language-specific strategies which only occur in sign languages, such as role shift or classifier verbs. Except for plain verbs, these strategies can convey additional cues for allowing the retrievability of the omitted referent. On the other hand, plain verbs do not contain any type of additional information in order to easily retrieve the referential entity. Therefore, it is assumed that the omission of the referent in the case of plain verbs may be permitted only in cases of exceptionally salient information.

These analyses allow us to draft a hierarchy which holds true for LIS by considering the ways in which all these referential expressions behave with respect to the shifted or continued status of information. From the most informative to the least informative referential expressions, these strategies are ordered as follows: nominal phrases, determiner phrases, pronouns, null arguments. With respect to null arguments in particular, a further internal hierarchy can be identified: role shift, combination of classifier verbs with agreement features, classifier verbs, agreement verbs and plain verbs.

A more comprehensive analysis, which also considers the sentential distance and the number of competitors between an antecedent and its anaphoric expression, lets us hypothesise a further correlation between the accessibility of a referent and the presence of the marker of squinted eyes. However, since the data displaying such an interaction is scattered, it is impossible to draw firm conclusions from the present corpus. Other studies are needed in order to further investigate this correlation.
In light of what has been considered in the present study, it is possible to outline a list of improvements which would be desirable in any future research. First of all, as far as possible, the number of signers participating in the study should be increased, possibly even doubled, in order to increase the reliability of the statistical analyses and to diminish the variation due to individual factors.

From a syntactic point of view, other structures which have been identified as aboutness topics, such as hanging topics and subjects, require a more specific analysis. Indeed, these structures should be more thoroughly investigated in order to provide a comprehensive account of the syntactic properties of aboutness topic positions.

Concerning scene-setting topics of time and location, since the current research has predominantly analysed adverbs of time and nominal expressions with locative functions, the expansion of this analysis to include more complex structures would be interesting, such as a proposition expressing time and locative information. This could be achieved through an appropriate elicitation task. In fact, in the spontaneous data such structures were rarer and have prevented a through insight into this phenomenon.
Regarding the study of topic types, the analysis of contrastive topics requires the collection of these topics through spontaneous data. In the process, a comparison could be drawn between all three topic types.

The use of prosodic markers with respect to some specific pragmatic functions, such as the use of squinted eyes as a marker for retrievability, should be more thoroughly investigated, through a collection and analysis of referents introduced after significant sentential distances between the antecedent and their anaphoric reintroduction.
A similar expansion is required for testing the number of competitors arising between the antecedent and its anaphoric resumption, especially in cases of more than 6 competitors. These improvements would allow either the validation or integration of the present results, in order to reach a better understanding of the behaviour of prosodic cues.

Despite the large number of unresolved issues, the present dissertation represents the first investigation of the prosodic, syntactic and pragmatic aspects involved in topichood in LIS.

Appendix I

Sentences and contexts which have been employed in the aboutness test.

1. Yesterday, there were many children at the workshop. I gave them some chocolate because generally children love it.

   re
   CHILD++ CHOCOLATE EAT DONE
   'As for the children, they have eaten chocolate'.

2. My mum loves fish, since today we have a celebration, she went to buy some fish at the supermarket.

   re eb
   TODAY MUM FISH CL:SUPERMARKET BUY
   'As for mum, today she bought some fish at the supermarket'.

3. Today my dad received a letter with the fees to be paid and he should pay everything by tomorrow. My daddy is very precise with this thing.

   re eb
   TOMORROW DAD FEE PAY HAVE_TO FORCED
   'As for dad, tomorrow he is forced to pay the fees'.

4. Yesterday I saw a dog in the street, poor dog, he was starving and he was following everyone in the street. At the end, he found some bone in the street. That's sweet!

   re
   YESTERDAY DOG $BONE_i$ $BITE_i$
   'As for the dog, yesterday he has bitten a bone'.

5. Today, the granny was walking in the countryside because she loves walking and at some point she heard a cat who was meowing.

   re eb+hn eb
   GRANMOTHER CAT TAKE
   'As for the grandmother, she takes the cat'.

6. Some research pointed out that chocolate is not good for children, but yesterday at the expo there was so much chocolate and it was impossible to resist the temptation to eat it. Therefore, children have finished it all!

   sq re eb
   YESTERDAY CHOCOLATE IX-3 CHILD EAT

As for the chocolate, yesterday the child ate it'.

7. I cannot stand to eat fish, but my mother says that it is very good for my health and that I should eat it. I would avoid it, but at the supermarket today there was a super fresh fish, then my mum bought it.

   eb re
   TODAY SUPERMARKET FISH$_i$ MUM BUY$_i$
   'As for the fish, today in the supermarket the mum bought it'.

8. Today a very long letter full of fees to be paid just arrived, fees are the thing my father hates most!

   sq re eb
   TODAY FEE$_i$ IX-3 DAD PAY$_i$
   'As for the fee, today the daddy has to pay it'.

9. Yesterday I went to the butcher and as always I asked something to eat for my dog. They gave me a big bone and yesterday I put it in the bowl. The dog was so happy that he suddenly ate it!

   re eb
   YESTERDAY BONE$_i$ DOG BITE$_i$
   'As for the bone, yesterday the dog bit it'.

10. Yesterday, my neighbour's cat got lost, he was so beautiful! He was all black with some white stripes and he was not very clever, then we were scared that he could suddenly get into troubles. By contrast, today my grandmother found him meowing in front of the window!

    re eb
    TODAY CAT IX-3 GRANMOTHER FIND
    'As for the cat, today, the grandmother found it'.

Appendix II

Figure 128. Restriction of the data to the aboutness topics.

```
```{r}
table(LIS$Topics, LIS$Type)

LIS2<-subset(LIS, Topics %in% c("Aboutness")) #restrict data to aboutness
LIS2<-subset(LIS2, Type %in% c("Monologues", "story-telling")) #restrict data to aboutness
LIS2$Realization[LIS2$Realization=="Pro"]<-"pro" #correct different spellings
LIS2<-droplevels(LIS2)
```
```

Figure 129. Contrast established for the creation of the statistical model.

```
```{r}
contrast<-cbind (c(1/2, 0, -1/2), c(1/3, -2/3, 1/3)) #+DP-pron, +overt-null
colnames(contrast)<-c("+DP-pron", "+overt-null")
contrasts(LIS2$Realization)<-contrast
contrasts(LIS2$Realization)

contrast<-cbind(c(1/2, -1/2)) #monologue, story
colnames(contrast)<-c("+monologue-story")
contrasts(LIS2$Type)<-contrast
contrasts(LIS2$Type)
```

Figure 130. The mixed effect logistic regression model with random slopes.

```
modelRQ2<-glmer(Frequency ~ Realization * Type + (Realization * Type|Signer), data=LIS2, family=binomial) #full model
only effects of realization
summary(modelRQ2)
```

Figure 131. Results which display the correlation between overt expressions, especially nominal phrases, and the occurrence of shifted contexts.

```
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: binomial  ( logit )
Formula: Frequency ~ Realization * Type + (Realization * Type | Signer)
   Data: LIS2

     AIC      BIC   logLik deviance df.resid
  1661.8   1807.9   -803.9   1607.8     1628

Scaled residuals:
    Min      1Q  Median      3Q     Max
-3.7211 -0.4581 -0.4168  0.5265  2.9547

Random effects:
 Groups Name                                      Variance Std.Dev. Corr
 Signer (Intercept)                               0.00000  0.00000
        Realization+DP-pron                       0.00629  0.07931    NaN
        Realization+overt-null                    0.07651  0.27661    NaN -0.12
        Type+monologue-story                      0.15134  0.38902    NaN -0.26 -0.93
        Realization+DP-pron:Type+monologue-story  0.59524  0.77152    NaN -0.62 -0.71  0.92
        Realization+overt-null:Type+monologue-story 0.32474  0.56986    NaN -0.94  0.46 -0.09  0.30
Number of obs: 1655, groups:  Signer, 9

Fixed effects:
                                          Estimate Std. Error z value Pr(>|z|)
(Intercept)                                0.1885     0.1006   1.873   0.0611 .
Realization+DP-pron                        1.3506     0.2789   4.843 1.28e-06 ***
Realization+overt-null                     2.7448     0.2004  13.695  < 2e-16 ***
Type+monologue-story                       0.2965     0.2208   1.343   0.1794
Realization+DP-pron:Type+monologue-story   0.7863     0.5618   1.400   0.1616
Realization+overt-null:Type+monologue-story  0.6348     0.3885   1.634   0.1022
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
            (Intr) Rl+DP- Rlzt+- Typ+m- R+DP-:
Rlztn+DP-pr  0.377
Rlztn+vrt-n  0.432  0.249
Typ+mnlg-st  0.342  0.108 -0.100
Rlz+DP-:T+-  0.142  0.291 -0.069  0.401
Rlztn+-:T+-  0.076 -0.029  0.406  0.302  0.207
convergence code: 0
boundary (singular) fit: see ?isSingular
```
```

Figure 132. Reduction of the aboutness topics data by eliminating the null arguments.

```
```{r}
LIS3<- subset(LIS2, Realization %in% c("DP", "pro"))
LIS3<-droplevels(LIS3)


contrast<-cbind(c(1/2, -1/2)) #monologue, story
colnames(contrast)<-c("+monologue-story")
contrasts(LIS3$Type)<-contrast
contrasts(LIS3$Type)


contrast<-cbind(c(-1/2, +1/2)) #continued, shifted
colnames(contrast)<-c("+shifted-continued")
contrasts(LIS3$Frequency)<-contrast
contrasts(LIS3$Frequency)

contrast<-cbind(c(1/2, -1/2)) #DP, pro
colnames(contrast)<-c("+DP-pro")
contrasts(LIS3$Realization)<-contrast
contrasts(LIS3$Realization)

```
```

Figure 133. Correlation between the marker of head tilt back and pronominal expressions.

```
```{r}
LIS3$Tilt.back[LIS3$Tilt.back==""]<-"no"
LIS3<-droplevels(LIS3)

table(LIS3$Realization, LIS3$Tilt.back)
modelRQ5<-glmer(Tilt.back ~ Realization + (Realization|Signer), data=LIS3, family=binomial)
summary(modelRQ5)
exp(2.5400)
```
```

```
Generalized linear mixed model fit by maximum likelihood (Laplace Approximation) ['glmerMod']
 Family: binomial  ( logit )
Formula: Tilt.back ~ Realization + (Realization | Signer)
   Data: LIS3

     AIC      BIC   logLik deviance df.resid
   235.7    257.7   -112.9    225.7      594

Scaled residuals:
    Min      1Q  Median      3Q     Max
-0.5244 -0.3049 -0.1400 -0.0854 12.0079

Random effects:
 Groups Name           Variance Std.Dev. Corr
 Signer (Intercept)    0.547506 0.73994
        Realizationpro 0.001057 0.03252  -1.00
Number of obs: 599, groups:  Signer, 9

Fixed effects:
               Estimate Std. Error z value Pr(>|z|)
(Intercept)     -4.7911     0.8376  -5.720 1.07e-08 ***
Realizationpro   2.5400     0.8662   2.932  0.00336 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Correlation of Fixed Effects:
            (Intr)
Realizatnpr -0.888
convergence code: 0
boundary (singular) fit: see ?isSingular
```

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Ciclo: XXXII

Titolo della tesi: Can you retrieve it? Pragmatic, morpho-syntactic and prosodic features in sentence topic types in Italian Sign Language (LIS).

Abstract:

The present research examines the prosodic realization and syntactic properties of three types of topic in LIS: aboutness topics, scene-setting topics and contrastive topics. The results show that both scene-setting and aboutness topics are accompanied by two prosodic cues (raised eyebrows and squinted eyes) and can be separated from the rest of the sentence by two prosodic boundary markers (eye blink and head nod). A preliminary investigation of contrastive topics identifies both prosodic (the rightward and leftward displacement of the body) and syntactic strategies (the use of different loci in the signing space) for expressing contrast. This seminal study on topicalization in LIS sheds light on the linguistic communicative strategies used by signers to manage old information. In line with the maxim of quantity, LIS signers make specific linguistic choices depending on the degree of accessibility and on the informational status of referents.

La presente ricerca indaga la realizzazione prosodica e le proprietà sintattiche di tre tipi di topic in LIS: aboutness, scene-setting e contrastivi. I risultati dimostrano che in LIS, i primi due topic sono accompagnati da due marker prosodici (sopracciglia-alzate e tensione-oculare) e possono essere separati dalla restante parte della frase da due marker di confine frasale (battito-cigliare e cenno del capo in avanti). Lo studio sui topic contrastivi ha evidenziato l'uso di strategie prosodiche, (i movimenti laterali del busto) e sintattiche, (l'uso di loci segnici differenti) come espressione di contrasto. Questo studio indaga anche le strategie linguistiche messe in luce dai segnanti, focalizzandosi sulla gestione dell'informazione data. In linea con la massima di quantità, i risultati in LIS dimostrano che i segnanti compiono delle scelte linguistiche specifiche in relazione al grado di accessibilità e allo status informazionale dei referenti.

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