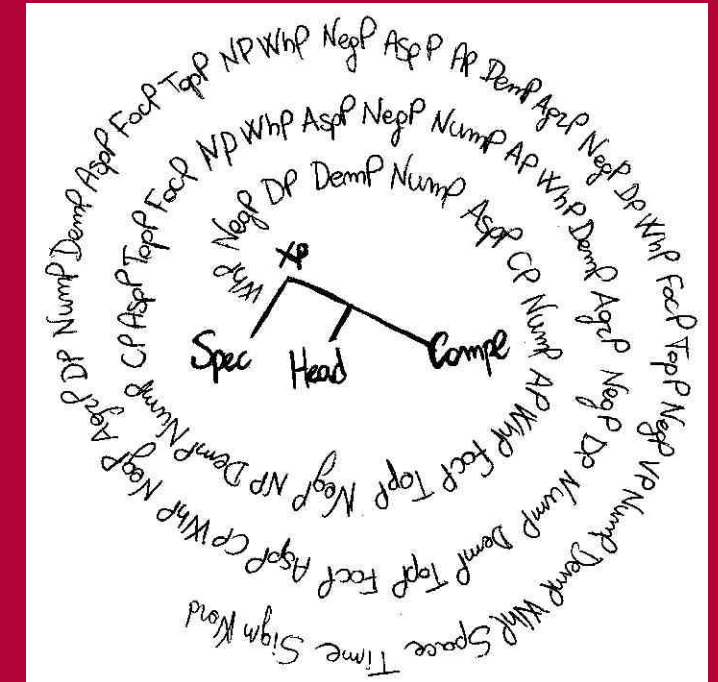Michele Brunelli

Antisymmetry and Sign Languages

A Comparison between NGT and LIS

This comparative study on the Sign Language of the Netherlands (NGT) and Italian Sign Language (LIS) addresses and discusses a wide range of aspects regarding grammar – the position of the adjectives, numerals and demonstratives, the linear ordering of selected aspectual markers and modals, topicalization, negation, imperative and interrogative clauses, as well as conditional clauses and LIS relative clauses. The study shows that LIS and NGT display a considerable degree of cross-and intra-linguistic variation and tries to assess whether the observed differences can be derived from one universal specifier-head-complement deep structure, shared by all sign and spoken languages. Although further aspects of LIS and NGT must still be examined, the study shows that an antisymmetric analysis of these sign languages is certainly worth undertaking.

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Antisymmetry and Sign Languages:
A Comparison between NGT and LIS

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ACADEMISCH PROEFSCHRIFT

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List of abbreviations for names of languages

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List of abbreviations for names of sign languages

ASL   American Sign Language

DGS   German Sign Language (Deutsche Gebärdensprache)

HKSL   Hong Kong Sign Language

IPSL   Indo-Pakistani Sign Language

KK   Kata Kolok

LIS   Italian Sign Language (Lingua dei Segni Italiana)

LIU   Jordanian Sign Language (Lughat al-Ishāra al-Urdunia)

LSC   Catalan Sign Language (Llengua de Signes Catalana)

NGT   Sign Language of the Netherlands (Nederlandse Gebarentaal)

Chapter 1: Introduction

Sign languages are a challenge to linguistics since they share important features with spoken languages, whilst also being very different. For instance, like spoken languages, sign languages have sublexical structure, word order constraints and also well-known morphological features such as plural marking or verbal inflection. Yet, at the same time, the visual modality of sign languages can have an effect on these features. For these reasons, sign languages provide a good oppurtunity to test the applicability of theoretical frameworks that have mainly been developed on the basis of spoken languages. By examining their applicability to languages in the visual modality such frameworks can be tested or further refined. Generative grammar, for example, must be able to handle sign language data since this framework claims to be a universal theory. We must be able to determine universal linguistic principles which hold for all languages regardless of modality, and distinguish those from principles that only hold for spoken languages. If a principle is applicable to both spoken and signed languages, it is a good candidate as a language universal, but if it holds only for spoken languages it can be called, at best, a "speech universal" (speech being understood as the act of speaking words). In the same way we may find "signing universals" that hold within the domain of signed languages but not for the spoken modality (nor for other modalities in which language appears[1]). Language universals can thus be seen as those principles that abstract and summarize both the universals of spoken languages and the universals of signed languages. Of course, it is also the case that sign languages are different from each other, that is, they show a certain crosslinguistic variation (Meier 2002) that must be measured and put in relation to universals. In terms of the linguistic endeavour, sign languages offer a threefold opportunity: 1) finding similarities between spoken

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[1] In this dissertation, I compare languages in the visual-gestural modality and languages in the oral-auditive modality. However, notice that also other modalities exist. For instance, tactile (sign) languages exist which are employed by deaf-blind people: they have yet another modality (i.e. tactile) different from both the oral and the visual ones. Here I will not discuss this modality, but the reader must bear in mind that future research has to be extended to all modalities in order to determine language universals. In fact, language universals are such only if they are valid across **all** modalities.

languages and sign languages (possible candidates for language universals); 2) finding differences between spoken and sign languages (modality specific universals, but not language universals); 3) determining the areas and range of variation between sign languages. By far the majority of research has been done on ASL and only recently have other sign languages been studied and crosslinguistic work been initiated. This dissertation aims to contribute to the three linguistic questions raised above by studying and comparing two unrelated sign languages, Italian Sign Language (Lingua dei Segni Italiana, *LIS*) and the Sign Language of the Netherlands (Nederlandse Gebarentaal, *NGT*). The aim will be to see to which extent notions taken from a generative X-bar framework, specifically antisymmetry, split-CP/DP and pied-piping, can be used and are useful in describing sign languages. This aim must be seen in the light of evaluating these notions in their applicability to languages regardless of the spoken or signed modality.

In this chapter, I will firstly describe some basic features of the syntax of sign languages that are relevant for the topic of this thesis (§1.1) such as sign order, use of space and nonmanual marking. Secondly, I will provide a theoretical introduction to the notions of antisymmetry, split-CP/DP and pied-piping (§1.2). In the next section (§1.3), I will briefly describe my methodology for making the comparison between LIS and NGT. Lastly I will outline the research questions and general organisation of the book (§1.4).

1.1 Sign language features

Making use of the visual modality, sign languages look very different from spoken languages. Indeed the difference is so striking that until fairly recently there was no general consensus that sign languages were languages at all[2]. On the other hand, sign languages appear very similar to each other – at least at first sight. Since the work of Stokoe (1960), we know that signs consist of some formational parameters[3] (handshape, position/location of the sign, and movement; later orientation of the palm

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[2] Amongst linguists it is generaly accepted that sign languages are natural languages but outside this field, it is common to find that people wonder whether SLs have a grammar or are a jutxtaposition of intuitive signs without any linguistic structure.

[3] The term parameter as used here is not to be confused with the parameters of Universal Grammar which will be discussed later.

was added as a fourth parameter). In contrast, words are made of vowels and consonants, each with different features (e.g. voiced/voiceless, nasal, open, closed…). Sign languages have a sublexical structure like spoken languages but they are very different from spoken languages in the way this sublexical level is realized in the visual modality. In Italian, for example, the minimal pair *caro* 'dear', *carro* 'cart' only differs in the length of the consonant 'r'. In LIS the minimal pair SORRY (signed on the chin), MOTHER (signed on the cheek) differs only in the location of the sign, since both signs share the same handshape-A (⌐) (Volterra 1987:48), the same repeated movement and the same orientation toward the signer (Verdirosi 1987). Sign languages are, however, similar to each other in that all of them rely on these sublexical parameters. Nevertheless at a lower level, sign languages differ from each other in the closed set of values for each parameter. As a result, sign(s) in one language may not be realizable in another sign language[4]. Other similarities between sign languages include the way their phonology, based on the visual modality, encodes morpho-syntactic features: for instance, changes in the movement of a sign are usually related to verbal aspect or mood. Thus in imperative constructions the movement of the sign-verb is usually more tensed and quicker than in indicative forms, whereas a repeated verbal movement may indicate the iterative form of a verb. Finally, differences in the movement parameter may even distinguish nouns from verbs: Radutzky (1992) showed that in LIS, for instance, verbs (e.g. GROW) have usually a longer and nonrepeated movement wheareas corresponding nouns (e.g. GROWTH) have a repeated shorter movement.

The discussion above has dealt mostly with the phonology of sign languages, but, as stated in the introduction, sign languages have also their own morpho-syntactic features and constraints. If we want to analyze sign language syntax and morphology in order to discover possible common rules or patterns, the issue of typological variation is relevant. Meier (2002), following Newport & Supalla (2000), explicitly suggests that sign languages and spoken languages have different patterns of variation:

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[4] This is much like stating that all spoken languages rely on consonants and vowels, even though they have different sets thereof.

«In general, sign languages may not exhibit unique linguistic rules, but may display a more limited range of variation than is true of spoken languages.»   (Meier 2002: 18)

«Although signed languages differ in their vocabularies, in word order, in the presence of auxiliary-like elements, and in other ways, they seem on the whole to be much less diverse typologically than are spoken languages.»   (Meier 2002: 20)

Meier also suggests that this would be due to «distinctive properties of the visual-gestural modality» as well as to «the youth of the languages that are produced and perceived in that modality» (Meier 2002: 20).

As stated in the introduction, it is an aim of this thesis to contribute towards separating out general language universals from possible modality universals. To this end, we must understand, for example, whether the more limited range of variation in signed languages is caused by the existence of some universals characteristic of all signed languages or whether it is just the result of some tendencies in the parametrical[5] setting of syntactic universals which in principle hold for every language, both spoken and signed. In other words, sign languages may appear less diverse typologically not because **all** of them lack (or show) one certain feature in their range of variation, but because **the vast majority** does. If just one sign language shares this particular feature with one or more spoken languages, we must conclude that the feature depends on the parametrical setting of some language universal; otherwise we can claim that it depends strictly on the visual modality. Meier himself hints at such tendencies (Meier 2002: 16):

«Thus, the difference between signed and spoken languages may be this: signed languages generally opt for nonconcatenative morphology, but make occasional use of sequential affixes. Spoken languages generally opt for concatenative morphology, but make limited use of nonconcatenative morphology.»

He admits that we may be dealing not with the lack (or obligatory presence) of some feature in the ranges of variation, but rather with some

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[5] Here the reference is to the parameters of Universal Grammar (see §1.2).

rare (or very frequent) feature. Comparing different sign languages with each other is thus as important as comparing sign languages with spoken languages. This section aims to briefly describe some prominent features of the syntax of sign languages that are interesting for cross-linguistic comparison: sign order, non manual marking, and the use of the sign space. I will also provide some information about the crosslinguistic variation between different sign languages found to date for these specific features.

1.1.1 Sign order

Communication can be achieved even in the absence of a fully-fledged language: some "mixed" gestures or words (e.g. 'help!' or 'I hungry…food…give') may be enough to convey basic messages, if the context is sufficiently clear and there is enough shared world knowledge. One of the characteristics that distinguishes language systems from communication systems is that the former (but not necessarily the latter) are subject to constraints, for instance, word order constraints. I am assuming here that different languages always have their own preferred order of elements in the sentence, although these may vary between languages, and that changes in this basic order are usually[6] motivated. Sign languages also have order patterns as spoken languages do, for example, with respect to verb, subject and object (see, for instance, Fischer (1975) and Liddell (1978) for ASL, Laudanna (1987) for LIS). The most frequent sign orders found to date are SVO, as is the case in American Sign Language (ASL) (1.a), for instance, and SOV, as in both LIS (1.b) and NGT (1.c).

1.

   a. JOHN   BUY   HOUSE   [ASL: Neidle et al. 2000: 81]
       'John   is buying a house'

   b. GIANNI   ACQUA BERE   [LIS: Bertone 2007: 161]
       Gianni   water   drink
       'Gianni drinks water'

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[6] I will not further discuss the question of configurational vs. non-configurational languages in this dissertation.

c. MAN BOEK OUD KOPEN   [NGT: Baker 2008: 25]
  man book old buy
  'The man buys the old book'

Evidence for the existence of a linear ordering in sign languages comes also from the fact that changing the ordering of signs conveys a different meaning. As chapter 4 will further explore, topicalization, for instance, in sign languages involves the fronting of lexical material, as is often the case in spoken languages, too. Thus, topicalized constituents are fronted in LIS (2.a) and NGT (2.b) as they are in Italian (2.c).

2.

    ‾‾top‾‾‾‾
a. WATER IX**,** GIANNI DRINK ALWAYS   [LIS]
  '(As for) The/that water, Gianni always drinks it'

    ‾‾top‾‾‾‾‾ ‾‾headnod‾‾
b. BOOK OLD IX**,** MAN BUY   [NGT]
  '(As for) The/that book, the man buys/bought it'

c. Il/Quel   film, l' ho   già visto [Ital.]
  the/that movie, it-CLT have-1SG already seen
  '(As for) The/that movie, I have already seen it'

Topicalized arguments, in sign languages, are usually separated from the rest of the sentence by intonational breaks (here represented with commas) and so-called nonmanual markers (see §1.1.2). The fact that topicalized objects (WATER, BOOK, movie) appear in sentence initial position shows that there is always a strong relationship between linear ordering of the elements and syntax, not only in spoken languages (2.c), but also in sign languages (2.a), (2.b). If linear ordering did not count at all in sign languages, it would be difficult to explain the relation between different sign orders and different syntactic operations. Studies on word order usually focus on the position of verb, subject and object, but there are also orders involved in the positioning of adverbs and negation with respect to the verb. On the same lines, within the DP, the word order refers to the position of adjectives, numerals and determiner with respect to the noun. As chapter 2 shows, such word orders have also been shown

to exist in sign languages (see Bertone (2007) for LIS; Vink (2004) for NGT; MacLaughlin (1997) for ASL).

Word order implies a linearity in organization. However, one striking difference between sign and spoken languages is that sign languages also allow for simultaneity (see a.o. Vermeerbergen et al. (2007)). Simultaneity can occur in the manual part of signing. That is, the signer sometimes can use two articulators, the two hands, to perform two signs at the same time, as in examples (3.a) and (3.b). Such simultaneous constructions do not most frequently occur in compound signs, as one might imagine, but tend to involve the co-occurrence of two different signs with different syntactic functions such as a verb and one of its arguments. For example, the verb can be performed with the one hand, while the other hand holds the sign which represents the object, possibly pronominalized or represented by a classifier. In other words sign orders can be SVO or SOV, but also S $\frac{O}{V}$ In both the NGT and LIS example (3.a),(3.b), the object HAND and the verb BITE are not only performed in the same location (LFT, that is, both to the signer's left), but also at the same time. In contrast, the subject, represented here by a pronominal index IX (RGT, that is, to the signer's right), precedes them on the time line. Both NGT and LIS informants have judged these sentences grammatical.

3.

   a. IX$_{\textbf{RGT}}$ $\begin{array}{c}\text{BI TE}_{\textbf{LFT}}\\ \text{HAND}_{\textbf{LFT}}\end{array}$ [LIS]
      'It bit(es) my hand'

   b. IX$_{\textbf{RGT}}$ $\begin{array}{c}\text{BI TE}_{\textbf{LFT}}\\ \text{HAND}_{\textbf{LFT}}\end{array}$ [NGT]
      'It bit(es) my hand'

Reciprocal forms of signed verbs also often rely on simultaneity (see, for instance, Pfau & Steinbach 2003). Each hand articulates the same verb at the same time, but in different (in fact, opposite) directions. When the phonological form of the sign does not allow simultaneity, for instance, when two hands are needed to articulate the sign, then each language switches back to its preferred sign order placing the signs on the time line according to one specific sequence. We must therefore conclude that,

although simultaneity must be taken into account as an apparently major difference between sign and spoken languages, sign languages base their syntax on sequential structures just like spoken languages do (for instance, see Pfau & Glück (2000) for a discussion of instances of pseudo-simultaneity). Only occasionally can sign languages "compress" their linear sequence.

Crosslinguistically, there is variation between sign languages with respect to word order. As mentioned above, there is general consensus that ASL is an SVO language. Kata Kolok, a village sign language of Bali recently studied by Marsaja (2008), also seems to be SVO. LIS and NGT have an SOV sign order like German Sign Language (Deutsche Gebärdensprache, *DGS)* (see chapter 3 for references and examples). Other differences in sign order may exist within the nominal domain, as this study will demonstrate. For instance, adjectives generally follow the noun in LIS, but they can precede it in NGT (see §2.1.4). In the present dissertation, different types of word order will be discussed in relation to the syntactic issues mentioned above.

In chapter 2, the order of elements related to the noun will be considered. Subsequently, in chapter 3, the order related to verb, negation, modals and some aspectual markers will be addressed. Order in different sentence types will be discussed in chapter 4. Finally, in chapter 5, I will discuss the orders of elements in some combinations of clauses, that is, I will address some sentences that consist of a matrix clause and a subordinate clause.

1.1.2 Nonmanual marking

In the early research on sign languages (Stokoe 1960), researchers focused on the phonology of signs in the manual part, that, is the information encoded with the hands. Later, increasing attention has been paid to nonmanual markers (NMMs), also called nonmanual components, that is, the linguistic information articulated by body parts other than the hands (a.o. Liddell (1978) and Bahan (1996) for ASL; Franchi (1987) and Pizzuto et al. (1990) for LIS; Coerts (1992) for NGT). At the same time as the hands articulate a sign, NMMs can be produced using orientation of the body, facial expressions (raise or lowered brows, open or closed eyes), direction of eye gaze, lip movements, and head movements. These NMMs can have diverse functions: lexical, morphological, syntactic, pragmatic. On the lexical level, for instance, lip movements or mouthings

usually, though not always, contribute to the "base form" of the sign by disambiguating signs that would otherwise be homophonous. In morphology, eye gaze and/or body shift may, under certain conditions, replace or contribute to mark verbal agreement (Bahan (1996) on ASL; Pizzuto et al. (1990) on LIS). Syntactic phenomena, too, can be marked by specific postures and facial expressions. For instance, topicalization is usually marked by "raised eyebrows" as in (2.a), (2.b) above. In this dissertation, since the focus is on syntax, only NMMs will be considered that encode syntactic features such as interrogativity, topicalization, negation, relative and conditional clauses.

NMMs may be superimposed on one sign, but can also spread over strings of signs, i.e. certain domains, thus marking entire phrases or clauses. As such, they resemble in many aspects some prosodic phenomena of spoken languages like intonation, which must also spread over lexical material (the words). The NGT example in (4) illustrates this spreading. The polar (i.e. yes/no) interrogative sentence in (4) is marked by raised eyebrows and head forward while its English counterpart has an interrogative intonation.

4.   <u>   yes/no interrog   . </u>
    WILLEN APPEL   JIJ   [NGT: Schermer et al. 1991: 191]
    want   apple   you
    'Would you like an apple?'

The spreading of NMMs is related to syntax as shown by their clear onset and offset boundaries. In the NGT example in (5), the boundaries of the topic nonmanual marker (raised eyebrows) and the negative nonmanual marker (negative "side-to-side" headshake) clearly distinguish the topicalized portion of the sentence from the negated part. For this reason, nonmanual markers are represented above the string of glossed signs with underscores indicating the duration of their spreading.

5.   <u> top   </u>   <u> neg. </u>
    STROKE ,   DARE   [NGT: Coerts 1992: 226]
    'To stroke (the lion), he didn't dare'

Example (5) also shows that NMMs can mark morphosyntactic features (although the status of NMMs is still a topic of research). In fact, Liddell

(1978) was the first to show that different NMMs systematically accompany interrogative clauses and negation in ASL. He also demonstrated that ASL has both internally headed and externally headed relative clauses marked by a special NMM. Many researchers have followed Liddell in studying NMMs in other sign languages (for example, Franchi (1987) and Pizzuto et al. (1990) for LIS; Coerts (1992) for NGT). In many sign languages it appears, for instance, that a facial expression "raised eyebrows" marks topicalization and, together with other NMMs, also yes/no questions. As chapter 5 illustrates, NMMs also mark conditional and relative clauses. They also mark LIS predicative adjectives derived from reduced relative clauses (Bertone 2007) and cleft constructions according to Branchini (2006). Moreover, as shown in chapter 4, NMMs distinguish yes/no interrogative clauses from wh-interrogative clauses.

As stated earlier, NMMs are comparable to prosody since they also spread. From the Italian examples in (6), it is clear that in spoken languages, prosody and syntax can be related. Comparing sentences[7] (6.a) and (6.b), for instance, interrogative intonation (indicated by '?') is often the only overt marker that distinguishes interrogative from declarative clauses:

6.
    a. Vuole   una mela   [Ital. with neutral intonation]
          want-3SG   an apple
          '(S)he wants an apple'

    b. Vuole   una mela**?**   [Ital. with interrog. intonation]
          want-3SG   an apple?
          'Does (s)he want an apple?'

Crosslinguistic research has shown that there is variation in the NMMs used in negative and interrogative clauses. Negation in NGT is signalled only by "side-to-side headshake" NMM, whereas in LIS, it is marked lexically by an obligatory specific negative sign NOT (which co-occurs with a NMM, according to Geraci (2005)). In DGS and Catalan Sign

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[7] Italian examples are based on my intuitions as a native speaker of Italian. The interogative sentence (6.b) has a raising intonation absent in (6.a).

Language (Llengua de Signes Catalana, *LSC*), the co-occurrence of an obligatory headshake with an optional lexical sign NICHT/NO has been observed (Pfau & Quer 2002). Along the same lines, interrogative clauses in LIS are marked by NMM markers only, whereas in NGT they also display a sentence final lexical (i.e. manual) marker "palm-up" (PU). The same (manual or nonmanual) marker can also be used to mark different syntactic phenomena. Pfau (2006) points out that conditional clauses in NGT share the same NMM "raised eyebrows" with topicalizations, paralleling the behaviour of some spoken languages.

NMMs will be discussed in this dissertation where they are involved in the syntax of sign languages. The negative NMM will be discussed in chapter 3. Yes/no and wh interrogative NMMs will be analyzed in chapter 4. NMMs of conditional and relative clauses are dealt with in chapter 5. The topic NMM will be discussed in chapter 4, but it also appears in other chapters, because it is involved in a number of different constructions.

1.1.3 Sign space

Another important common feature of sign languages is their use of space to convey linguistic information. Crucially, the signing space is not only employed as a location for the articulation of a lexical sign, but may also serve morpho-syntactic functions. Different spatial locations can indeed encode referentiality in pronominalization and agreement. Not surprisingly, this very specific feature of sign languages has been extensively studied. Almost all sign languages analyzed to date appear to be similar in their use of space; thus, at least at first sight, Meier's (2002) variation hypothesis mentioned earlier is supported on the basis of this feature. Here, I will briefly address the issue of the use of space, of pronouns and verbal agreement.

In sign languages, pointing toward the signer's body encodes reference to 1st person (i.e. to the Speaker/Signer[8]), pointing towards the person who the signer has eye-contact with encodes reference to 2nd person (i.e. to the Addressee[9]) and pointing to every other location

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[8] Speaker is used here with an abstract meaning, that is, not in the literal sense of "s/he who speaks words", but in a broader sense as "s/he who produces the utterance" in whatever language and modality.

[9] Addressee is meant here as both Hearer/Listener of a spoken utterance and as "s/he who looks at" a signed utterance.

encodes reference to 3rd person. Different 3rd persons can be distinguished: the most common way is to point to the right or left, encoding a 3rd "right" person and a 3rd "left" person, but occasionally also other locations can be determined. Using these locations, many sign languages can inflect the verb by changing its orientation and/or movement towards and from these locations (a.o. Padden (1990) for ASL; Pizzuto (1987) for LIS; Bos (1993) for NGT; Keller (1998) and Rathmann & Mathur (2002) for DGS)[10]. The use of space marks a great contrast between sign languages and spoken languages. In spoken languages, different phonological forms spell out the same pronominal meaning (e.g. 1st person singular pronoun in Italian/Dutch/Maori *io/ik/ahau*, or the 2nd person singular forms *tu/jij/koe*) and different verbal endings encode the same person. In contrast, sign languages point to the same locations. Crucially, the 1st, 2nd and 3rd person pronouns of signed languages clearly show a compositional nature. They all consist of the same deictic act of pointing (usually the index finger extended[11]), and this transparently expresses reference and appears in all persons. At the same time, different locations are used which directly correspond to the categories of Speaker and Addressee, that is pronominal persons. The 2nd person pronoun, which refers to the Addressee, results from the combination of pointing and the location indicated by the signer's eye contact. Likewise, the 1^{sg} person pronoun, that is, reference to the Signer/Speaker, is literally pointing to the location of the signing person. In contrast, the personal pronouns of spoken languages are not easily decomposable into a variable part representing the Speaker or the Hearer and an invariable part which encodes reference for all pronouns both crosslinguistically and across persons. To the best of my knowledge, spoken forms *tu/jij/koe* 'you' and *io/ik/ahau* 'I' share no visible common morphemes although they are all referential.

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[10] Kata Kolok (Marsaja 2008) is an exception, because it lacks overt verbal inflection almost completely. See further discussion below.

[11] To the best of my knowledge, this is by far the most frequently employed form to express personal pronouns in sign languages. Other configurations can be used (for instance B-handshapes), but, as far as I know, they serve emphatic or possessive functions (see §2.1.2). What is important here, is that once a configuration is chosen (be it a B-handshape or the index finger extended), it remains the same for all persons. Also notice that at least in LIS and NGT, the index finger extended may be used in possessive forms in addition to personal pronouns (see chapter 2).

Pronouns fall into a wider class of signs, the use of which is linked to the signing space, the so-called indexes. These are pointing signs (usually made with the index finger) which have various referential uses. Sometimes they are clearly recognizable as pronouns, locatives or demonstratives because of their position in the sentence or because of the NMMs which may accompany them. In other cases, their exact status is more vague. For instance, it may be difficult to determine whether they function as clitics or as agreement markers affixed to the lexical sign. Besides, indexes may be used either to refer to the location of a sign previously articulated or to assign a location to a sign. For instance, they may be employed to assign a location to nouns that require contact with the body and therefore cannot be positioned freely in the signing space, as in (7.b). Compare (7.b) with (7.a). In (7.a) the noun CHILD is articulated in a specific location (here, slightly to the right) and this location is subsequently used for verbal agreement. In (7.b) the sign MAN requires contact with the body and therefore cannot be articulated in any other location. It is therefore associated with a location using a nominal index (NIX). This index has a different function from the optional 1st person pronominal index (IX_1).

7.

   a.   (IX_1) CHILD$_{RGT}$ $_1$CALL$_{RGT}$ [LIS/NGT]
       'I call the/a child'

   b.   (IX_1) MAN NIX$_{RGT}$ $_1$CALL$_{RGT}$ [LIS/NGT]
       'I call the/a man'

As we see from these examples, inflecting verbs in sign languages consist of one handshape (representing the base meaning of the verb) which moves to and from different locations, whereas spoken languages rely on conventional phonological forms (e.g. suffixes). Verbal agreement is not the focus of this study, but it is necessary to explain this phenomenon briefly (see further discussion in §3.1.1). Many sign languages share the same system to encode the agreement of the verb with (one or more of) its arguments. They have a rich agreement marking based on the use of space, whereby the base-form of the sign-verb is moved and/or oriented in different directions matching the locations previously established for the arguments. In this way they can encode agreement with both

subject/agent and object/patient. As mentioned above, such systems have been found in ASL, NGT, LIS and DGS, for example, where verbs inflect by changing the start- and end-point of their movements (that is, their direction) as well as their orientation. In the LIS/NGT examples (7.a), (7.b), the verb CALL is performed near the signer's body (1st person subject) but moves and is oriented toward the location of CHILD/MAN (3rd person object). Note however, that this system is only used with some verbs, indeed called "agreeing verbs". There also exist another class of verbs, the so-called "plain verbs", which realize agreement in a different way and show more crosslinguistic variation. LIS, for example, uses special indexes, possibly clitics (Bertone 2007), which have a different status from usual pronouns as well as a different sign order. On the other hand, NGT (Coerts 1992, Schermer et al. 1991) has an agreement auxiliary sign OP (glossed "act-on" by Bos (1994)) and DGS has a similar auxiliary AUF, also glossed *Person Agreement Marker* (*PAM*). In (8.a) and (8.b) examples are given of another agreeing verb and in (9.a) and (9.b) of a plain verb in both LIS and NGT.

8.
    a. $_{RGT}$PHONE$_1$ [LIS]

    b. $_{RGT}$PHONE$_1$ [NGT]
       '(S)he phones/d me'

9.
    a.   IX$_{RGT}$ LOVE IX$_1$ [LIS]

    b.   LOVE $_{RGT}$OP$_1$ [NGT]
       '(S)he loves/d me'

Whereas in (8.a) and (8.b), LIS and NGT follow the same pattern and move the verb from a position related to 's/he' toward the position of the signer, in (9.a) and (9.b) they differ from each other. LIS uses indexes which have a shorter movement than the one of usual pronouns and are signed close to the verb. NGT uses the auxiliary OP (so called because it is accompanied by the mouthing /op/), the function of which is to mark person agreement but not tense.

Given this, a major difference emerges between spoken languages and sign languages. Spoken languages tend to have one agreement system and use it consistently, that is, all lexical verbs either inflect in the same way (e.g. Italian, Dutch), or they don't inflect at all (e.g. Chinese). Auxiliary of modal verbs may be exceptional in this respect (English modal verbs, for instance, lack the 3rd person singular present indicative ending *–s*). In the visual modality, however, sign languages may use different agreement systems depending on verb types: some verbs have full inflection, others no inflection, and still others a mixed inflection. In the oral modality, variation is therefore primarily **cross**linguistic while in the visual modality it can be **intra**linguistic. The different amount of variation we observe among sign and spoken languages may be just due to the fact that researchers have been looking mainly for crosslinguistic variation.

Nevertheless spoken languages still seem to display a wider variation ranging from "highly inflected" to "not overtly inflected". In contrast, many sign languages studied to date have some kind of agreement. From the point of view of the variation hypothesis, this would mean that sign languages do not display as much crosslinguistic variation as spoken languages. However, at least one striking counterexample exists for sign languages. Kata Kolok, a sign language used by both deaf and hearing people in a northern Balinese village, has been described as having no inflected verbs at all. According to Marsaja (2008: 168), Kata Kolok relies on «a strict SVO order» to disambiguate object and patient because its verbs do not change their direction and orientation to agree with the locations of their arguments [12]. In other words, Kata Kolok behaves much like an analytic language with respect to verbal agreement. Roughly speaking, we can say that LIS and NGT have a rich verbal agreement comparable to spoken languages like Basque, whereas Kata Kolok is at the opposite extreme, comparable to Chinese. This is particularly important since it proves that **in principle** there is crosslinguistic variation in the morpho-syntax of sign languages as there is in spoken

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[12] Only one exception seems to exist, the possibility to change the direction of the verb BAANG ('give'): however, it has acquired this feature only recently and as an option, since it usually retains its base form regardless of its arguments. Note also, that the author hints at the possible presence/emergence of an auxiliary sign (Marsaja 2008:171) but it is not clear how the language is consistent in its use. In contrast, its use of SVO order seems to be more consistent.

languages, though there seem to be less variation between sign languages with respect to some aspects.

1.2 Theoretical framework

The theoretical framework adopted in this dissertation is that of Chomsky's Generative Grammar, in particular X-bar theory, using the concept of Universal Grammar. It is not the intention to provide a full review of this framework here, but to briefly describe the notions that are the focus of this thesis (split CP/DP, anti-symmetry and pied-piping) and the basic mechanisms of this approach. Knowledge of concepts such as "deep/surface structure" (Chomsky 1957), "movement", "thematic role" ("ϑ-role") is assumed.

Chomsky's work posits the idea of innate linguistic principles so that generative linguistics has automatically been involved in searching for Universal Grammar. In this perspective, natural languages share most of their underlying structure/organization and only some parametrical adjustment occurs in acquisition, which accounts for the different surface structures observed crosslinguistically. According to Chomsky's (1981) theory of **Principles and Parameters** (P&P), the range of (crosslinguistic) variation is restricted to setting the value of a definite number of parameters[13], whereas principles reflect universal biological laws holding for all natural human languages. In the following sections, the notions crucial for this study will be briefly described: X-bar theory, split-CP, antisymmetry, and pied-piping.

1.2.1 X-bar theory and its extension

The original proposal of the so-called X-bar theory (Chomsky 1970, Jackendoff 1977) restricts the phrase structure rules employed in describing syntax and states that in languages, lexical categories such as verbs and nouns have one deep **phrase structure**. In other words, the relations between such lexical categories are represented as relations between phrases, all of which have the same structure. The general phrase structure consists of one **head**, one **specifier** and one **complement** according to the schema in (10). The head (X°) is dominated by an

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[13] Parameter here means parameter of Universal Grammar and is not to be confused with the *formational parameter(s)* which constitute the phonological building blocks of a sign.

intermediate projection (X'), which combines with a specifier (Spec) to build up a maximal projection (XP). The intermediate projection X' also dominates the complement (compl) of the head. X° determines the status of the maximal projection XP. Both specifier and complement are other maximal projections (YP, ZP).

10.

```
                        XP
                  (max.projection)
                  /            \
               YP              X'
        (specifier: other   (intermed. proj.)
        max.. projection)      /      \
                            X°          ZP
                          (head)    (complement: other
                                     max.. projection)
```
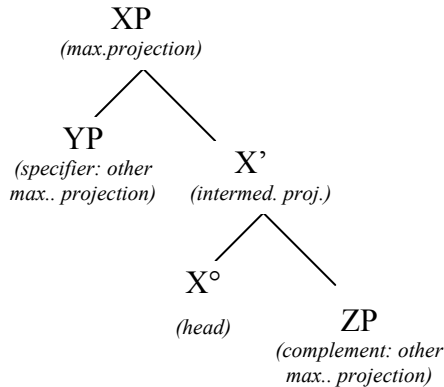
Thus, relations between categories such as Verb and Noun are defined as the result of structural relations between nodes in a tree of lexical phrases (VP, NP). Later, however, Chomsky (1986) suggested that languages have functional phrases that dominate the lexical phrases. X-bar theory should then be applied not only to lexical categories, but also to functional categories like, for instance, C(omplementizers) and I(nflection). According to this extended model, the functional phrase IP is taken to be projected above VP and the functional phrase CP is taken to be above IP. Along similar lines, Abney (1987) suggested extending this model further to the nominal domain with the functional phrase DP (the determiner phrase) projected above NP.

Further proposals have argued for a finer structure including more projections. First, Pollock (1989) suggested that the IP was not a projection in itself but was made up of two other projections (AgrP and T(ns)P) instead, responsible for subject agreement and tense marking, respectively. This followed from the observation that in many languages, the inflectional ending of a verb actually consists of a tense morpheme and a subject agreement morpheme. Ritter (1991) in turn proposed that

DP also comprises a projection for number (NumP). In fact, in a way, a split-DP hypothesis in embryo is present in Abney's (1987) proposal that at least some adjectives are hosted in dedicated projections located below DP (but above NP). Abney's (1987) treatment of APs is different from Cinque's (2000, 2005a) analysis, which I adopt in this dissertation. Nevertheless, the placement of at least some adjective projections between the NP and DP shows that, according to Abney (1987), the extended projection of a noun cannot consist of just one projection (the one for determiners).

Later research has argued for more subdivisions in both DP and IP. DP and IP have become labels actually representing groups of functional phrases or "subprojections" related to nouns and verbs, respectively. These functional projections somehow increase the features of the lexical base form (of verbs and nouns) multiplying the inflectional possibilites in a combinatorial manner (e.g. tenses×persons or genders×numbers). All this seems to entail some "parallelism" assumption between phrases, that is a kind of "proportional relation" between the noun with its functional projections and the verb with its functional projections that we may informally summarize as "NP is to DP subprojections as VP is to IP subprojections". This parallelism appears even stronger if we take into account Giusti's (1993) proposal for a case projection KP and a quantifier projection QP, both higher than DP. This suggested that some projections are above DP just as CP is above IP. Later a slight adjustment occurred in the names and position of projections. Szabolcsi (1994) proposed that DP is the counterpart of CP, while Giusti (1996) argued that **within** DP, there are some projections dedicated to topicalization or focalization, phenomena usually attributed to the CP domain (see §1.2.2). Different authors now assume that the DP contains discourse-related projections (Bernstein 2001, Aboh 2004, Giusti 2005). Crucially, for both nouns and verbs a threefold link appears between lexical and functional phrases since the earlier theories of splitting. First, there is a "lower" lexical area where thematic-roles (e.g. subjects, possessors, complements) are assigned. Second then, there is a "middle" functional area mostly related to agreement and modifiers (adverbs and adjectives). Finally, there is a "higher" area related to discourse phenomena such as focus, topic, quantification, case, subordination.

The different relations between phrases are formalized by Chomsky (1986) building on the definition of *c-command* (constituent command) first proposed by Reinhart (1976). Chomsky's definition reads as follows:

> α c-commands β iff α does not dominates β nor vice versa, and every node γ that dominates α dominates β.   (Chomsky 1986: 8)

A certain freedom in linear ordering is still possible in this framework. Crosslinguistic variation as, for instance, SVO vs SOV word order was attributed to different parametric settings. Kayne's (1994) theory of anti-symmetry proposes a different account. I will come back to his account in §1.2.3.

1.2.2 Split-CP

Rizzi's (1997) theory of *split-CP* proposes that the CP projection be divided into many layers. The CP should therefore not be treated as one single phrase but as a group of various "subprojections", since it entails the presence of various phrases responsible for different syntactic phenomena. The split-CP can thus be seen as the continuation of other theories that previously proposed splitting, that is, subdividing IP and DP projections into further projections. In §1.2.1 we saw that the earlier theories of splitting suggested the existence, above both NP and VP, of distinct areas or layers containing either functional or discourse-related projections. A threefold parallelism emerged between noun-related and verb-related projections whereby, given two lexical categories Verb and Noun, the lower lexical layer VP can be seen as the verbal counterpart of the lexical layer NP, the middle functional layer IP appears as the verbal counterpart of the functional DP layer, and the CP layer appears as the counterpart of the higher (quantifier, focus, topic, case) projections related to the noun (the higher part of DP). Intuitively then, NP is to DP functional projections and to DP higher projections what VP is to IP functional projections and to CP:

NP : DP (funct.projections) : DP (high projections) ≈ VP : IP (funct.projections) : CP

Given this, it is predictable that also the label CP actually "covers" various higher, discourse-related projections above the IP area as there are various higher projections above the functional DP area. Indeed,

Rizzi's proposal for a split-CP fills the gap by claiming that CP, too, consists of a number of higher functional projections responsible, for instance, for focusing and topicalization (Top, FocP) in addition to the complementizer. According to Rizzi's (1997) first proposal, CP is structured as follows:

11. Force(P)…Top(P)…Foc(P)…Top(P)…Fin(P)

Below FinP, the IP layer begins. Later, more authors have argued for a finer structure of CP, which will be discussed in §4.2 and §5.2

1.2.3 Antisymmetry

As previously seen (§1.2.1), X-bar theory posits a deep tree structure resulting from the combination of phrases which in turn share the same structure consisting of one head, one complement and one specifier. Yet, in its original formulation a certain freedom in the (linear) ordering of the tree-nodes was allowed. Some crosslinguistic variations (such as, for instance, surface SVO vs. SOV word orders) were ascribed to different parametric settings, in the light of P&P theory, which map the same universal hierarchical structure onto different linearizations. In other words, parametric variation determined whether the structure branches leftwards or rightwards. For instance, the three orders depicted in (12) to (14) were all compatible with the original formulation of X-bar theory, depending on whether the specifier and the complement are both to the right of the head, both to the left, or one to the left and the other to the right. Thus, for example, Specifier-Head-Complement (12), Specifier-Complement-Head (14), and Complement-Head-Specifier (13) were all possible combinations.

12. Spec-Head-Compl

13. Compl-Head-Spec

```
            XP
      (max.projection)
         /    \
        /      \
(specifier)     X'
           (intermed. proj.)
              /    \
             /      \
           X°        \
         (head)       YP
                  (other max.
                  projections)
```

```
                          XP
                    (max.projection)
                       /      \
                      /        \
                     X'      (specifier)
                (intermed. proj.)
                   /    \
                  /      \
                YP        X°
          (other max.   (head)
          projections)
```

14. Spec-Compl-Head

```
       XP
 (max.projection)
    /    \
   /      \
(specifier) X'
       (intermed. proj.)
          /    \
         /      \
       YP        X°
  (other max.  (head)
  projections)
```
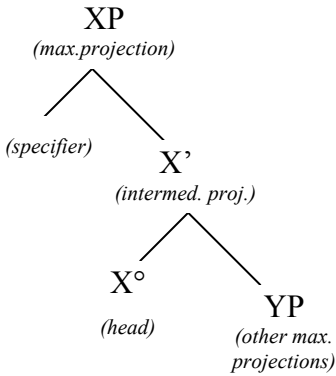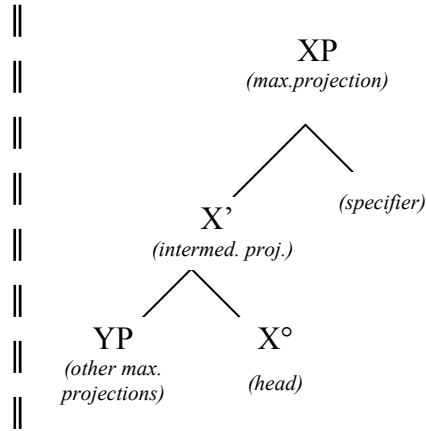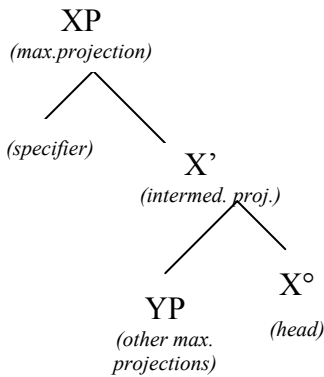
Kayne (1994) revised this theory, building on the definition of **asymmetrical c-command**. He proposed the *Linear Correspondence Axiom* (LCA) to map asymmetrical c-command onto linear ordering. X-bar theory is then not a primitive of UG but is derived. Crucially, the same rules which derive X-bar theory also entail that X-bar structure must be either Specifier-Head-Complement or Complement-Head-

Specifier. Intuitively, the fact that the structures such as Specifier-Complement-Head (14) are not suitable for linearization, while others such (12) and (13) are, can be represented in the following way. Let us imagine a very simple language which combines only two maximal projections. Let us also assume that this language has only one word for each specifier and one word for each head. The linear order will be represented by "*w 1*" as the first word on the left, increasing this number by +1 for each node on the right and decreasing it (-1) for each node on the left. The Spec-Head-Complement of (12) is then as in (15) and the Spec-Compl-Head structure (14) as in (16).
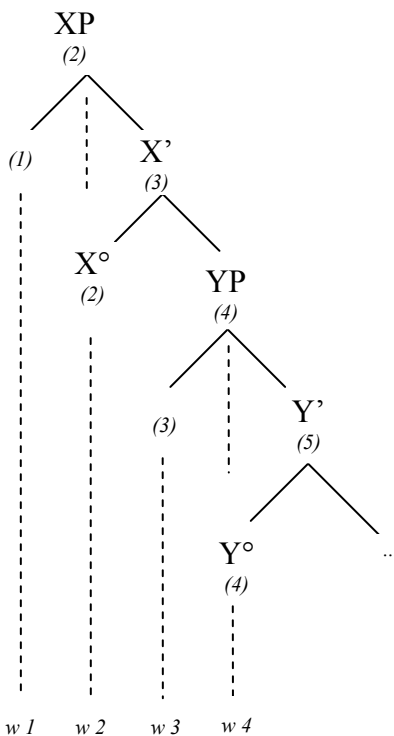
15. Spec-Head-Compl   16. Spec-Compl-Head
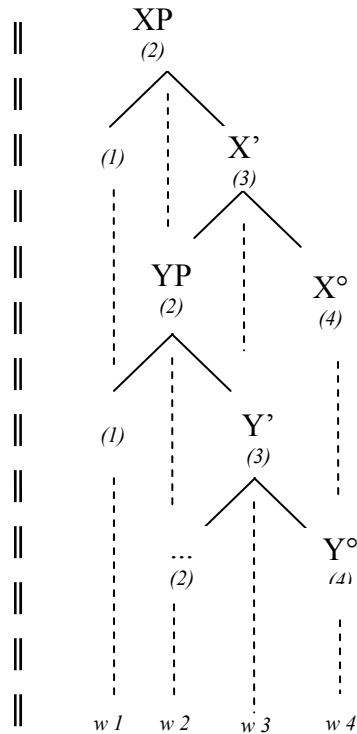
With respect to the linear ordering of words, the configuration in (15) intuitively represents the fact that precedence/subsequence derives

automatically from hierarchical syntactic relations (a relation which Kayne formulates more accurately in terms of antisymmetric c-command and LCA). Moving one node up or down in the structure (e.g. jumping between [Spec;XP] and X°) implies automatically one step forward or backward in the linear order. Crucially, the fact that specifiers are to the left of heads and heads are to the left of their complements translates automatically into a linear order when maximal projections are combined. In fact, the Spec-Head-Compl structure (15) is an example of Kaynean structure, which maps syntactic relations onto linear order. In (15) each maximal projection XP/YP is (vertically) aligned with its head X°/Y°: this means that, when a speaker of this hypothetical language hears a head in a certain position, he/she is also able to recognize that a maximal projection (a phrase) is there. This intuitively represents the assumption that the head determines the categorial status of the phrase since, for instance, when a verbal head is encountered, a verbal phrase is present and, when a nominal head is enconuntered, a nominal phrase is present. Of course, operations of movement may scramble this linear order (and indeed languages may have some syntactic ambiguities) but *in principle* this structure is unambiguous. Also note that the specifier of a projection can overlap the intermediate projection (X' /Y') of the higher phrase, but intermediate projections are never spelled-out so that no confusion can arise (intermediate projections, indeed, do not count as "terminal nodes" in Kayne's theory). If the opposite structure (Compl-Head-Spec) were applied, the ordering woul be simply reversed, with the specifier of XP as last word and Y° as the first word. No other major differences would arise. The linear order would still derive automatically from the position of specifiers and heads, when maximal projections are combined, as it did in (15). Informally, we can say that, with both Spec-Head-Complement and Complement-Head-Spec tree structures, each slot in the linear order (on the left-right axis) corresponds automatically to a distinct position in the syntactic hierarchy (on the up-down axis). The fact that these structures represent at the same time both linearization and syntactic relations in this one-to-one way represents graphically Kayne's assumption that there is a mapping relation between linear order and syntactic hierarchy/structure.

In contrast in (16), where both the specifier and the complement are to the left of the head (Spec-Compl-Head structure), the linear order does not derive automatically when maximal projections are combined. In (16),

maximal projections are not aligned with their heads: two heads (X°=Y°) are aligned, instead, or two specifiers. This captures the observation that mixed structures do not linearize on the basis of Kayne's LCA. Rather, they require further stipulations to predict the linear order. Indeed, it is certainly possible to assume that these branching structures do not encode any mapping relations between syntax and linear order, but then, the linear order must be accounted for with independent motivations. In fact, one position in the linear order of (16) does not automatically imply a distinct position in the syntactic hierarchy. Consequently, in order to relate linear order and syntactic hierarchy in mixed structures, it is necessary to consider both c-command and precedence/subsequence as distinct factors. Thus, consistently Spec-Head-Compl and Compl-Head-Spec structures require less stipulations than mixed structures in order to put in relation linear order and syntactic hierarchy[14]. Graphically, it is possible to lengthen some branches of the tree in order to show that two given elements in the structure do not overlap. However, lengthening one branch does not count in X-bar theory. According to Generative Grammar there is no Branch Length Parameter available for the hearer to disambiguate the linear order of a structure as (16).

The impossibility to relate directly linear order and syntactic hierarchy in (16) also means that even in a simple language with only two projections and without any movement, the linear ordering is already ambiguous in its basic structure. In other words, the speaker of this hypothetical language cannot predict whether the word in fourth position represents a head X° or a head Y° and consequently is not able to recognize the phrase. At the same time, two specifiers may overlap thus leading to the same ambiguity. Crucially, ambiguity is "built in" in this structure. From the point of view of elaboration of the linguistic input, this causes a greater cognitive load for the hearer.

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[14] A more radical view may be that resorting to further stipulations questions the validity of the tree structure itself. If further stipulations are necessary to derive the linear order, then branching is not an adequate tool. If branching is not adequate to account for linear order, then choosing a Spec-Compl-Head structure over Compl-Head-Spec or Spec-Head-Compl structures becomes irrelevant to the purpose of linearization.

Alternatively, if branching is not adequate, but we still maintain that Spec-Head-Compl tree structures are relevant for linearization, the whole results in a contradictory attempt to account for linear order by means of a branching structure that does not linearize.

Thus, only Spec-Head-Compl or Compl-Head-Spec are suitable structures to relate syntax to linear order. Among this two possible structures, Kayne then chooses the former **(Spec-Head-Compl)** as a universal because it allows to rule out some word orders which actually are never found in natural languages. There appears, thus, *one* direct relation between hierarchical structure (X-bar structure) and surface linearization:

> «X-bar theory is not a primitive component of UG [...] expresses a set of antisymmetric properties of phrase structure. This antisymmetry of phrase structure will be seen to be inherited, in effect, from the more basic antisymmetry of linear order.»   (Kayne 1994: 3)

Since the linear order follows the temporal order, with strings of words/signs occurring along the time line, X-bar theory gets linked to the streaming of time, which is especially desirable if we consider that languages, too, are part of the tangible world which is constrained by laws of space and time. Of the two logically possible orders, Kayne chooses the binary left-branching *Spec-Head-Compl* as universal by claiming that the mapping relation instantiated by the LCA is more specifically a relation of *precedence* (instead of subsequence) and in doing so this unidirectionality of Universal Grammar turns out to be an instance of the unidirectional flow of time:

> «This S-H-C property of UG, as well as the fact that UG does not make both orders available, is thus seen to be ultimately related to the asymmetry of time.»   (Kayne 1994: 38)

As a consequence, phrases are linked in one and the same order. Surface orders other than the only one directly available to UG must be derived through leftward movement of one or more constituents and can no longer be ascribed to parametrical variation of the branching structure. Crucially, this theory matches empirical observations on word order. For instance, some orders of adjectives, nouns and numerals are never attested crosslinguistically (see §2.2.2). In a framework where different deep structures are freely available, it would be difficult to relate the freedom of order at deep structure level with the restrictions on the order at surface level. Under Antisymmetry, the raising movement, which in

principle could be either leftward or rightward, can only be leftward (see the next section) because the higher nodes where material moves to are consistently to the left of the lower nodes from which the material raises.

1.2.4 Pied-piping

Since Kayne's antisymmetry affects the ordering of all projections, the different word orders observed within the DP of languages (e.g. adjectives, numerals, determiners) must all be related to one and the same underlying phrasal structure. Likewise, the different word orders observed in the IP projections of languages (adverbs, aspectual markers, negation) must be all linked to one and the same structure. This theoretical framework matches the observations of different authors. Greenberg (1963) notes that word order in languages is not entirely accidental but is constrained by some universal principles and tendencies. Baker (1985) also observes that the order of free morphemes and of bound morphemes is related by what he calls a "mirror principle". Sproat & Shih (1988) have suggested some constraints on the ordering of attributive adjectives in English and Mandarin. On the basis of analysis of the position of adverbs and grammatical affixes in different languages, Cinque (1999) proposed a universal hierarchy of functional projections within the IP domain. As for CP, Rizzi's theory, developed mainly on the basis of Italian data, relies on a Spec-Head-Compl structure.

As seen in §1.2.3, antisymmetry also states that the only option to generate linear orders different from the universal one made available by UG is leftward movement. Cinque (2000, 2005a) thus explicitly relies on a massive application of **pied-piping** to derive the various orderings of elements inside the DP such as determiners, numerals, and adjectives, starting from a fixed **Dem**onstrative > **Num**eral > **A**djective > **N**oun hierarchy. Pied-piping has been primarily related to wh-question inversion and occurs when the first element that raises also "drags" along other elements. Thus the fronted wh-element triggers the (leftward) movement of other elements. According to Cinque, the movement within DP can occur in different ways. First, it can involve only the raising of the NP. Alternatively, the (projection containing the) NP can raise and drag along the preceding element with a pied-piping that Cinque refers to as the "picture-of-who" type. Finally, the (projection containing the) NP can invert with the preceding element, before dragging it along, so as to produce a rolling-up effect that Cinque calls a "whose-picture" type of

pied-piping. This point will be illustrated using examples (17) to (19), which are taken from Cinque (2005a). The surface orders Dem-Num-A-N, Dem-A-N-Num, and N-A-Num-Dem are derived from one universal deep structure with one merge order of elements. In the following, I shall use Cinque's terminology to distinguish the two types of pied-piping.

17. Dem Num A N   (no raising, no pied-piping: universal base ordering)

18. Dem A N Num   (partial NP raising with *picture of who* pied-piping of A)

19. N A Num Dem   (raising of NP with successive pied-pipings of the *whose picture* type)

Cinque takes the order in (17) as the merge order. In other words, he assumes that the **Dem Num A N** surface order of (17) derives directly from the universal hierarchy of projections **DemP > NumP > AP > NP** when no movement occurs in the structure. Then he derives other orders by admitting that the NP first moves leftwards and possibly triggers the pied-piping of the first node dominating the moved element: a sequence of pied-pipings yields successive roll-up movements by which the elements may end up in (partially) reverse order. In this way, for instance, both the previous orders in (18) and (19) are derived from the merge order of (17).

In (18) the noun raises across Num dragging along also the Adjective *before* itself creating the order: **Dem [A N] Num** $t_{[A-N]}$. On the other hand, in (19) the noun moves across the adjective, then raises around the numeral dragging along the adjecive behind itself and finally moves across the demonstrative dragging along both adjective and numeral. First, the order **Dem Num [N] A** t_N is generated, subsequently the order **Dem [N A] Num** $t_{[N-A]}$ is produced, and finally **[N A Num] Dem** $t_{[N-A-NUM]}$ obtains. For the sake of simplicity, in each step, I have reported only the trace left by the group of lexical elements moved in that step.

In Cinque's perspective, the movements are triggered by the need for the adjective(s), the numeral and the demonstrative to target different AGReement projections inside the DP, where they can undergo agreement with the nominal phrase. Indeed, agreement between noun, adjectives, numerals, and demonstratives is observed across different languages of the world. In Cinque's framework, also other noun-related phenomena,

like the presence of quantifiers, genitive, construct state and their different word orders can be accounted for, but here a basic structure will be exemplified. Accordingly, the derivations of (18) and (19) are represented in (20) and (21). In (20), an AgrP containing noun and adjective raises to the specifier of an AgrP located to the left of the NumP. In (21), the NP raises to the specifier of the first AgrP, located above the adjective. This AgrP then raises to the specifier of the AgrP above NumP. This latter raises to the specifier of an AgrP located above DemP.

20. Derivation of Dem A N Num (18)

```
        ...
      AgrP
      /  \
         / \
          FP
         / \
    DemP  / \
          AgrP
          / \
            / \
             FP
            / \
      NumP  / \
            AgrP
            /|\
             / \
              FP
             / \
          AP  / \
              NP
              /\
             /__\
```
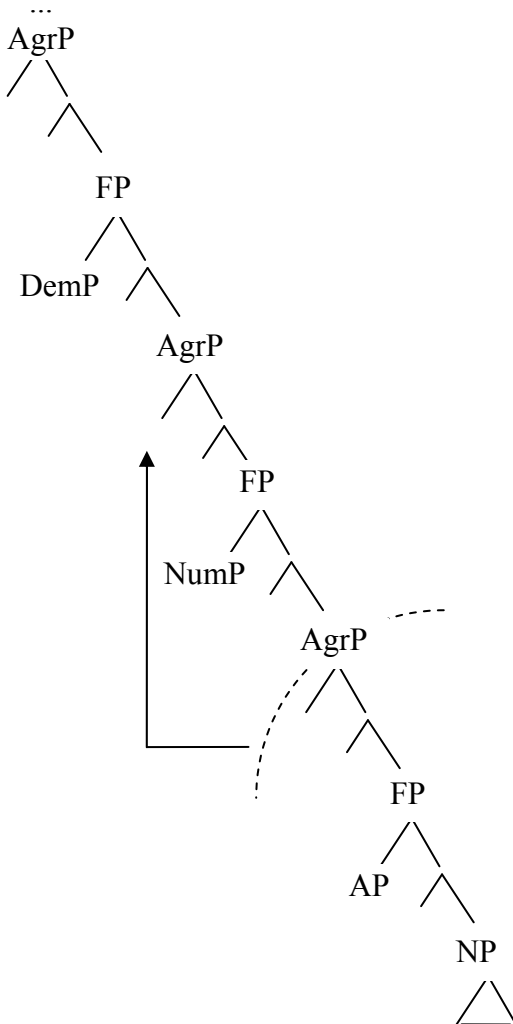
21. Derivation of N A Num Dem (19)
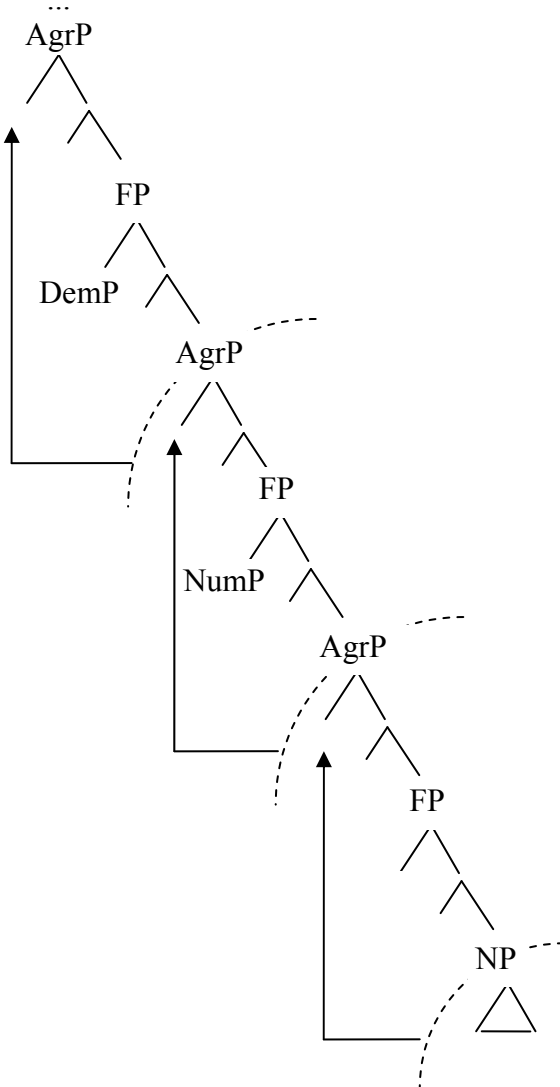
Cinque also notes that the lower/higher degree of markedness of DP-related word orders matches the degree of markedness of other independent pied-piping phenomena. Pied-piping with inversion (of the

whose picture type) is generally less marked and also generates less marked ordering of elements in the DP. Looking at (21), one sees that "rolling-up" pied-pipings, that is *whose-picture* pied-pipings, result when a lower projection moves leftwards across a higher one, producing a first inversion, and then a yet higher projection (here AgrP) containing the two inverted elements, raises further up. *Picture-of-who* pied-pipings as in (20) occur when AgrP raises leftwards without previous inversion of the lower projections contained in it. Thus, in my view, in order to raise N-A across Num, two leftward movements are required, whereas raising A-N across Num requires only one leftward movement. From this point of view, the qualitative difference between *whose-picture* and *picture-of-who* pied-piping is a quantitative difference of leftward movements. In this light, it seems that the regular application of leftward movement (if any) is less marked than applying leftward movement intermittently. It is less costly to apply repeatedly one movement rule in a sequence (for instance, move N across A, move AgrP across Num, and so on…) than to "list" the projections which move and those which do not move (for instance, N does not move across A, but AgrP does move across Num; or the first AgrP does not move, but the second does…). As the different leftward movements can occur independently from each other, for example, AgrP may raise without previous movement of N, it appears that each leftward movement must be independently motivated. Subsequent leftward movements have also been suggested by Poletto & Pollock (2004) and Munaro & Pollock (2005) to give a unified account for wh-questions in spoken languages with wh-doubling, wh in-situ, and sentence-final wh. Poletto also provides an analysis of Zanuttini's (1997) data on negation compatible with antisymmetry. Different positions in the sentence seem to be involved in the process of negation and their ordering can be accounted for by subsequent leftward movements.

1.3 Methodology

As stated in the very first section of this chapter, this study intends to examine the differences between two sign languages, LIS and NGT, with respect to certain syntactic phenomena (antisymmetry, split CP/DP, and pied-piping). Firstly, the goal was to assess the amount of variation between the two sign languages and secondly to examine the possiblity of using frameworks developed for spoken languages in accounting for sign languages. In order to make the comparison between LIS and NGT, it

was necessary to obtain or collect data involving the target constructions. It was not possible to cover every aspect of the syntax of NGT and LIS; also, this was not the goal since this study will in general try to verify whether a general theoretical framework proposed on the basis of work on spoken languages can successfully be applied to sign languages, despite the modality differences (§1.4).

The data discussed in this dissertation come from databases collected by different authors as well as from my own work with informants. There were three informants for NGT, two female and one male. Two informants came from central Holland and one from the Groningen area, thus different regional variaties of NGT were involved. All three informants were born deaf and have a good knowledge of written Dutch. For LIS, two informants were predominantly used: a deaf man born to deaf parents, who therefore has acquired LIS as his first language, and a hearing woman born to deaf parents, who therefore had acquired both LIS and spoken Italian as her first languages. As already mentioned, additional data was taken from the literature. Although more informants would be needed to reach definitive conclusions, I think that the data presented here are sufficient to allow for a first comparison between the two languages.

The data elicited from informants were not elicited using pictures or films. For reasons of efficiency, I had to elicit data using written sentences while asking the subjects for a translation in their own sign language. The informants were then filmed producing the translations. On the basis of the film material, it was then possible to analyse the sentences in detail with respect to the manual and nonmanual components. In order to better differentiate the subtleties of meaning that might be conveyed by one sentence, I often discussed the recorded sentences with the informants after they had produced the translation. This was done in either NGT or LIS, although I am a not a native signer of either language. By using the respective sign language, my intention was to create a more natural situation.

In addition to the translation, I also explicitly asked the informants for grammaticality judgements, as is commonly done in research about spoken languages. For NGT I constructed sentences and then asked the informants whether these sentences were acceptable. For LIS I relied both on data I had collected in the past and on data provided in studies by other authors. Based on the previously collected data, I had also

constructed sentences in LIS and asked for grammaticality judgements. In the following, whenever no source is given for an example, this means that I have elicited the example from an informant myself. Grammaticality judgements have not been used in many research projects on sign languages, but certainly in some (e.g. van Gijn 2004). Signers, just like speakers, are able to give grammaticality judgements about their own native language. The use of other research data will increase the number of informants. Nevertheless, the results still have to be interpreted in the light of a relatively limited dataset. I also think that researchers who are native signers of the language under investigation could help very much in the analysis of sign languages because they have direct "instinctive" access to the subtleties of their own language and no specific elicitation tasks would be required.

Finally, certain conventions have been used for glossing the signed sentences. All sentences are glossed in English, except for examples from the literature that appear in a different language in the original source. Obviously, the same gloss for signs from two different sign languages does not necessarily imply that the two signs also have the same phonological form. Signs are glossed in SMALL CAPS and their location in space is indicated by subscripts (e.g. SIGN$_{\text{SUBSCRIPT}}$) when relevant for the analysis. For example, let us consider an NGT sentence glossed in English, as (22).

22. YESTERDAY STRANGE PERSON$_{\textbf{RGT}}$ $_{\textbf{RGT}}$COME$_{\textbf{1}}$ [NGT]
    'Yesterday a strange person came to me'

The subscript is written to the right of the gloss when only one location is employed, that is, in the majority of cases. In (22), the noun PERSON is articulated on the right side of the signing space. With verbs and signs which move between two locations, the starting point is indicated on the left and the endpoint on the right of the gloss. As explained in §1.1.3, locations are important when they mark agreement between different parts of speech. They are symbolized as follows: "**1**" for 1$^{\text{st}}$ person, "**2**" for 2$^{\text{nd}}$ person, "**RGT/LFT**" for 3$^{\text{rd}}$ persons located to the left or the right of the signer, respectively. Thus, the verb COME in (22) moves from the right, the location introduced for PERSON, towards the signer. Locating a 3$^{\text{rd}}$ person sign in the space often depends on a free choice of the signer, only constrained by the condition that one and the same location be used consistently when different elements agree. In other words, the same

location must be shared by agreeing elements – for instance, when a noun and an adjective agree, when a verb agrees with its argument(s), or when a pronoun refers back to a noun previously signed. An English translation appears below the gloss. As mentioned in §1.1.2, nonmanual markers are glossed, when relevant, above the string of signs which they accompany during the utterance, and their spreading domain is indicated by an underscore as in the LIS example (23).

23. PRESIDENT_{RGT} IX₁ SEE_{RGT} NEVER   [LIS]

$$\overline{\text{top.}}$$

23. PRESIDENT$_{\textbf{RGT}}$ IX$_\textbf{1}$ SEE$_{\textbf{RGT}}$ NEVER   [LIS]
    '(As for) The President, I have never seen him'

Indexes such as IX in (23) are "pointing signs" which sometimes can be safely translated as pronouns or demonstratives, but in other cases do not have an overt counterpart in the translation because their function is more similar to that of agreement markers or clitics. They may also cover other functions, though having the same phonological form. They will be glossed as follows:

- IX = index whose exact status is not easily recognizable (it may be an agreement marker, a personal pronoun, or one of the followings) or is not relevant in the analysis
- NIX = nominal index, used to assign a location to those nouns which cannot be articulated in the desired location
- DIX = demonstrative, which usually serves also as 3rd person strong personal pronoun
- LIX = locative index
- PIX = possessive index

In (23), for instance, the general gloss IX is used. In contrast, in (24) the prenominal 1st person possessive index PIX$_1$ precedes the noun BROTHER and clearly occupies a position different from that of the nominal index NIX$_{\textbf{LFT}}$ used to assign a location, which follows the noun.

24.   [NGT]
    YESTERDAY STRANGE PERSON$_{\textbf{RGT}}$ PIX$_\textbf{1}$ BROTHER NIX$_{\textbf{LFT}}$ $_{\textbf{RGT}}$GO$_{\textbf{LFT}}$
    'Yesterday a strange person went to my brother'

In example (24), the subject/agent of the verb is the 3rd person which was signed on the right ("a strange person") while the object of the verb is the referent which was signed on the left ("my brother"). It is thus clear, due to the movement of the verb, that "a strange person" went to "my brother" and not the other way around.

Other features which may convey important morphosyntactic information are set in superscripts (SIGN$^{\text{SUPERSCRIPT}}$) when necessary. This is often the case with aspectual marking on verbs which requires alterations of the movement of the base form. Finally, reduplication of a sign, when relevant for the analysis, is represented by '++' (SIGN++) and triplication by '+++' (SIGN+++).

In some examples, a literal translation is necessary to provide a clearer meaning of the glosses and the morphological markers (e.g. agreement markers) without altering the sign/word. In such cases, verbal agreement is consequently indicated on the verb as **1S**(ubject)/ **1O**(bject), **2S/2O,** or **3S/3O**; indications "**LEFT**" or "**RIGHT**" will be added only when necessary to disambiguate two different 3rd persons. Also note that, for the purpose of this dissertation, the label "object" will equally refer to direct objects (e.g. 'she saw/phoned *me*'), indirect objects (e.g. 'she spoke *to me*'), and locative objects (e.g. 'she came *to me*') unless a more detailed description is required by the context, in which case other specifications will be added. In some cases, additional information will be reported on a separate line, in italics.

1.4 Aims and contents of this book

As mentioned in §1.2, a considerable amount of research has been and still is devoted to trying to explain spoken language data in the light of antisymmetric structures. Rizzi (1997) proposed a split-CP hypothesis where CP is divided into different projections ordered in a Spec-Head-Compl structure. Likewise, Cinque (2005a) shows that the word orders related to DP can be derived from a split-DP divided in many projections again according to one Spec-Head-Compl structure. Cinque (1999) also suggests one hierarchical structure of (adverbial and aspectual) functional projections inside IP. In contrast, research on sign languages has often been based on the assumption that the deep structure may show different internal orders.

On the one hand, for instance, wh-questions in spoken languages with wh-in-situ, sentence-final-wh and wh-doubling have been discussed by Poletto & Pollock (2004) and Munaro & Pollock (2005). They have assumed that CP branches according to a Spec-Head-Compl structure (thus with all Specs on the left). On the other hand, analyses of ASL wh-questions have either assumed that [Spec;CP] is on the left (Petronio & Lillo-Martin 1997) or on the right (Neidle et al. 2000). Similarly, interrogative and relative clauses in LIS have been analyzed assuming that [Spec;CP] is on the right (Cecchetto, Zucchi & Geraci 2004), but Pfau's (2006a) analysis of NGT topicalizations and conditional clauses in terms of a split-CP with Spec-Head-Compl structure is also compatible with LIS topicalization and conditionals (Brunelli 2007). Bertone (2007) has derived the order of elements in the DP of LIS using the same account as Cinque (2005a) for the DP in spoken languages, whereas such order of elements is usually taken as part of evidence that LIS is head-final.

If we really take for granted that sign languages are natural languages, we are forced to assume firstly, that theories developed for spoken languages must hold also for sign languages. Therefore, secondly, it should be possible to account for all crosslinguistic variation among sign languages with one Spec-Head-Compl branching structure (as it is proposed for spoken languages) and with the same theoretical tools developed for spoken languages up to now. Conversely, new theoretical formulations which may emerge on the basis of data from sign languages should hold also for spoken languages, since we are dealing with universal structures. Sign languages may thus be important for the refinement, confirmation, or rejection of hypotheses which up to now have mostly been based on spoken languages.

The aim of this dissertation is then to evaluate to what extent antisymmetry, split-CP/DP and pied-piping can be used in describing sign languages and therefore to measure to what extent these notions can be applied to languages regardless of modality. In this dissertation, data from LIS and NGT will be compared in an attempt to account for this crosslinguistic variation in the light of such theories. The work will focus on DP and CP phenomena in these two sign languages as well as on negation, modals, and some aspectual markers. Verbal agreement is not dealt with here, but it will be exploited as a piece of evidence when discussing the position of modals and negations inside the IP.

The book is organized as follows. Chapter 2 will compare data on DPs (adjectives, possessives, numerals, and pluralization) of both LIS and NGT and then attempt to derive different orders from the same hierarchical structure by means of pied-piping, thereby extending to NGT Bertone's (2007) proposal for LIS. Chapter 3 will be devoted to the structure of the simple sentence with specific emphasis on negation. As mentioned above, verbal agreement, although presented briefly, will not be discussed because this would require more research than is possible within the scope of this study. In the context of negation, I will also take into consideration agreement and other phenomena such as aspectual marking and the position of some modals since in this way, the hierarchical IP structure of these two sign languages can be described and then compared to the one already proposed for spoken languages. The analysis will try to extend Cinque's (1999) universal hierarchy of functional heads within the IP domain to sign languages and will attempt to account for negative clauses by means of leftward movements.

Chapter 4 will then deal with some left periphery phenomena such as topicalizations and interrogative clauses. Imperatives will also be discussed. An analysis of LIS and NGT interrogative clauses (both yes/no and wh) will be attempted building on Brunelli's (2007) proposal for LIS, on Aboh, Pfau & Zeshan's (2005) and Aboh & Pfau's (2011) analysis of interrogative clauses in NGT and Indopakistani Sign Language, and on Poletto & Pollock's (2004) and Munaro & Pollock's (2005) unified account for wh-in-situ and sentence-initial-wh spoken languages.

Chapter 5 will analyze left periphery phenomena involving combinations of clauses (i.e. conditionals and relative clauses) building on Pfau's (2006a) proposal for NGT conditionals and Cinque's (2003, 2005b) unified account for both internally headed and externally headed relative clauses of spoken languages.

Each chapter contains a section where data from LIS and NGT are presented together for ease of comparison followed by an analysis section. Sometimes data from other languages, both signed and spoken, will be discussed in order to test the hypotheses more thoroughly.

The final chapter brings together the results and discusses the implications for the central issues of this study.

Chapter 2: The structure of DP

This chapter compares the DP domain of LIS and NGT, focusing in particular on the ordering of nouns, adjectives, numerals, possessives as well as various kinds of indexes, including demonstratives and locatives. Following and extending the split-DP model based on Abney (1987) (see §1.2.1), all these noun-related elements are considered to be part of the DP. Spoken languages show considerable variation in the ordering of these DP-related elements. However, some of the possible combinations are not attested (Greenberg 1963; Hawkins 1983; Cinque 2000, 2005a, and references therein). As sign languages are natural languages, one might expect that their linear ordering of elements displays crosslinguistic variation similar to that observed in spoken languages. In other words, sign languages should display orders attested in spoken languages and not display orders not attested in spoken languages. The assumption that UG restricts linguistic variation leads one to expect that these restrictions hold for all modalities and that crosslinguistic variation should always have the same limits, regardless of modality. Therefore, the attested crosslinguistic variation in sign languages should be explainable based on the same theories developed for spoken languages.

In this chapter, I will analyze the main differences in the linear ordering of elements (signs) within the DP of LIS and NGT. The aim is to verify whether the crosslinguistic variation found in these two languages fits the typology of spoken languages and, therefore, whether Cinque's (2000, 2005a) analysis of the DP can be extended to sign languages. The position of quantifiers (which sit above DP according to Giusti (1993) and Giusti & Cardinaletti (2005)) will also be discussed. In some sentences, sign languages employ nonmanual markers (NMMs, see §1.1.2) which occasionally help to separate the "DP area" from other parts of the sentence. For this reason, nonmanual markers will be taken into account here, albeit to a minor extent. Note also that sign languages often make use of special signs called classifiers. The analysis of classifiers is outside the scope of this dissertation, but the reader must bear in mind that such signs may appear in the examples[15]. The reader

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[15] For studies on classifiers in sign languages, the reader is referred to a.o. Corazza (1990) and Corazza & Pizzuto (2000) for LIS, Zwitserlood (2003) for NGT, and Benedicto & Brentari (2004) for ASL; see papers in Emmorey (2003) for a discussion of classifier constructions in different sign languages.

must also be aware that in sign languages, different DP-related elements may have the same (or a similar) lexical form, although they might perform different functions: especially demonstratives, locatives, and possessives may all be represented by indexes (§1.1.3). Some of these elements, however, differ in their plural forms, which are distinct from the singular, as well as in the position that they occupy in the sentence. The chapter is organized as follows. A brief overview of the different uses of indexes is given in §2.1.1. Indexes are then described depending on the function that they fulfill, that is, in the sections dealing with possessives (§2.1.2) and demonstratives and locatives (§2.1.3).

In §2.1 data are presented related to the ordering of a number of DP-related elements in LIS and NGT, such as adjectives, numerals, demonstrative indexes, quantifiers, possessives, locative indexes, and location-assigning nominal indexes. Before addressing the order of signs within DP, I will briefly introduce some facts about the noun and the different types of indexes. The second part of the chapter (§2.2) proposes an analysis of NGT sign order following theories developed for spoken languages which have already been applied successfully to the DP of LIS. In turn, the analysis of LIS (mostly based on Bertone (2007)) will be refined in an attempt to also capture the behaviour of possessives and quantifiers. Conclusions follow in §2.3.

2.1 Word order within the DP

As will become clear throughout the chapter, all DP elements follow the noun in LIS, but are split into different groups according to their behaviours in NGT. Some of them (quantifiers, possessives and some "higher" adjectives) appear to be strictly prenominal according to the data collected. Locatives, in contrast, are strictly postnominal and interact in different ways with demonstratives. Finally, other elements (numerals, adjectives) can be either pre- or postnominal. The data will be presented according to this categorization. The chapter is thus organized as follows: §2.1.1 is an introduction to the noun and to the different uses of indexes; §2.1.2 presents quantifiers, possessives and some "higher adjectives"; §2.1.3 describes the ordering of demonstratives and locatives; §2.1.4 focuses on numerals and adjectives; §2.1.5 describes the order of these elements when they are combined, and §2.1.6 is a general summary.

2.1.1 Introduction

This section will provide some introductory information about the noun, the "core element" of the DP. It will also describe briefly the different indexes and their functions for a better understanding of the next section. In LIS and NGT, not all nouns display an overt plural form. The pluralization strategies include reduplication of the base form of the sign or zero marking (i.e. the plural is not overtly marked on the noun). For a discussion of different pluralization strategies, I refer the reader to Nijhof & Zwitserlood (1999) for NGT, and to Pizzuto (1987), Pizzuto et al. (1990, 1997), Corazza & Pizzuto (1996) and Bertone (2007) for LIS. Also, Pfau & Steinbach (2006) compare different plural constructions available in sign languages with the ways plurality is marked in spoken languages. Although marking of plurality in sign languages is an interesting issue, I shall not provide an account for plural marking in this dissertation. I shall simply indicate reduplication by adding '++' to the base form of the noun, while triplication will be indicated by adding '+++' (see §1.3). For the purpose of this dissertation, the reader must bear in mind that the plural may be overtly encoded on the verb and not on the noun, but also vice versa, that is, the noun may be overtly inflected for plural while the verb is not. This latter point can be shown with very simple sentences such as in (25.a) and (25.b). In (25.b) there is a plural subject (CHILD++), whereas (25.a) contains a singular subject (CHILD). Nevertheless, the verb (PLAY) has one and the same form in both sentences, that is, it does not show number distinction.

25.

    a.   CHILD$_{LFT}$ PLAY   [LIS/NGT]
       'The child plays'

    b.   CHILD$_{LFT}$++ PLAY   [LIS/NGT]
       'The children play'

The nonmanual marker which, in some sentences, delimites the boundaries of the DP is also important. According to Bertone, definiteness is associated with an optional index in (26.b) and with a "DP" nonmanual marker in (26.b) and (26.c). The properties of this NMM are not entirely clear. Bertone mentions suprasegmental features marking the DP (in Italian «...*tratto sovrasegmentale che caratterizza il*

DP», 2007: 40). She also mentions a nonmanual marking usually consisting of raised eyebrows, the same expression typical of both the topic and the DP (in Italian *«...marcatura non manuale generalmente costituita dall'inarcamento delle sopracciglia, la stessa espressione caratterizza il topic e il DP»*, 2007: 56). However, this NMM does not appear on all DPs in the data. Compare (26.a) with (26.b), (26.c). The "dp" NMM occurs only on the latter two examples. Notice that the location of the signs is not always represented in the glosses. Authors sometimes do not report any location or they simply indicate a general '3' position for third person arguments, or use a letter (i/j/k) to distinguish different positions and indicate agreement with other elements.

26.   [LIS: adapted from Bertone 2007:160]

 a. IX$_1$ CITTÀ VISITARE PIACERE
   I city visit like
   'I like to visit cities'
   'I like to visit the city/some cities'

        <u> dp. </u>
 b. IX$_1$ CITTÀ$_3$ (IX$_3$) IX$_1$ VISITARE PIACERE
   I city (index) I visit like
   'I like to visit that city'

             <u> dp. </u>
 c. IX$_1$ (GENOVA, TORINO) CITTÀ+++ VISITARE+++ PIACERE
   I (Genova, Torino) city-PL visit-PL   like
   'I like to visit the cities (of Genova, Torino)'

Throughout the dissertation, it will also become clear that indexes cover different functions in a sentence, as already mentioned in chapter 1 and at the beginning of this chapter. Apart from being demonstratives or locatives, they may act as personal (subject/object) pronouns, like the 1st person index IX$_1$ ('I') above. They may also accompany the noun as possessive indexes (PIX) or as special location-assigning nominal indexes (NIX), which provide the noun with a location, subsequently used to mark agreement. It is important to note that NIXes are different from all other indexes as NIXes **assign** a location to the referent, instead of resuming it.

The NGT examples in (27) show a clear relation between different functions and different positions of indexes, although their lexical forms may be very similar or even identical. In sentence (27.a), the topic nonmanual marker "raised eyebrows" clearly sets apart the whole DP complex **possessive.index – noun –nomin.index** from the rest of the sentence. Not all DPs are marked as topics, however, as far as I could observe (see §1.1.1, §4.1 and examples (26.a-26.c) in this section). Also, as we shall see in §4.1.5, Crasborn et al. (2009:362) point out that "raised eyebrows" marking is not always obligatory in NGT, although an intonational break separates the topicalized constituent from the rest of the sentence.

27.

    a.   [NGT: GIDS 3.0, localisatie – inleiding 3/13]

                          <u> **top** </u>

PIX$_1$ BROTHER NIX$_{RGT}$ THIS^EVENING IX$_{RGT}$ $_{RGT}$VISIT$_1$

'My brother, tonight he will visit me'

    b.   [NGT: adapted from Crasborn et al. 2009:365]

BOEK IX$_{RGT}$,   IX$_{LFT}$ WEGGOOIEN   (IX$_{RGT}$)

book there/that   he   throw away   (it)

'He threw away the book'

In (27.a), the 1st person possessive index, glossed PIX$_1$, precedes the noun, whereas the location-assigning nominal index (here pointing to the signer's right) NIX$_{RGT}$ follows it. The location pointed to by the nominal index is then resumed by verbal agreement (the verb VISIT starts moving from that location toward the signer's body) and by the personal pronoun IX which accompanies the verb. This index, functioning as pronoun, intervenes between the verb and the time expression THIS^EVENING. In the following sections, the comparison between LIS and NGT will show that PIXes and NIXes occupy distinct positions in the sentence in the two languages. In (27.b), the NP BOEK is accompanied by an index. Crasborn et al. (2009) render this index as a locative or demonstrative ('there/that') in their interlinear translation, but translate the sentence with just a definite article ('the book'). Given its uncertain status, in this case, I gloss the postnominal index simply as IX$_{RGT}$. Still, both the function and the linear position of this IX are different from those of the PIX in (27.a). In

(27.b), we also see a preverbal index IX$_{LFT}$, which acts as a subject pronoun, and an optional postverbal index IX$_{RGT}$, which acts as an anaphoric/resumptive pronoun referring to the topic. The status of indexes can also be inferred from other properties, such as, for instance, the fact that some indexes have (different) plural forms (see, for instance, MacLaughlin (1997) for a discussion of ASL indexes).

With respect to number marking, demonstratives and personal pronouns usually distinguish the singular (*I*, *you*(SG), *that/this/he*) from the plural (*we*, *you*(PL), *those/these/they*) agreeing overtly with plural nouns. Demonstrative indexes (DIXes) may also behave as 3rd person personal pronouns, although demonstratives – at least in LIS – usually have a more tense movement than some pronouns. Possessives do not agree with plural possessees unlike, for example, Italian *nostro fratello* ('our-SG brother') vs. *nostri fratelli* ('our-PL brothers') or Dutch *ons kind* ('our-SG child') vs *onze kinderen* ('our-PL children'). However, sign languages do mark the plurality of the possessor (much as 'our' is different from 'my'). Singular possessor forms are usually pointing movements made with the forefinger towards a spatial location, while plural possessor forms are usually "line-movements" (in the form of a sideward arc or a circle) made with the forefinger around or near a location. Reduplication of demonstratives or possessives, in contrast, marks emphasis (see §2.1.3). See, for instance, the difference between the plural DIX^{ARC} and the emphatic singular DIX++ in the following LIS examples:

28.

    a. DIX^{ARC} [LIS]
        'these/those ones'

    b. DIX++   [LIS]
        'that very one / exactly that one'

In contrast, locative indexes, glossed LIX here, function as the locative adverbs 'here/there' and, as such, they do not have plural forms, since there are neither *heres nor *theres. LIXes are then easily distinguished from plural IXes, but may have the same (or a very similar) lexical form as singular IXes. However, even in case of phonological ambiguity, they may still be recognized from the position which they occupy in the

sentence. For instance, in (29.a) and (29.b), judged grammatical by both LIS and NGT informants, the locative index clearly occupies a position different from the 1st person subject pronoun index. The LIX is either situated between subject index and verb as in (29.a) or follows the verb as in (29.b).

29.   [LIS/NGT]

    a.   YESTERDAY IX$_{1}$ BEACH GO$_{RGT}$. IX$_{1}$ LIX$_{RGT}$ PLAY, SWIM, WALK
        'Yesterday I went to the beach (and) there I played, swam (and) walked'

    b.   IX$_{1}$^{ARC} PLAY LIX$_{RGT}$ [LIS/NGT]
        'We play(ed) there'

Indexes, once they are recognized, help infer the presence of a copula when a null copula is used. LIS and NGT, like most sign languages, do not have overt copulas, much like spoken languages such as Russian or Hebrew. Thus, in LIS example (30), three different indexes appear: a nominal index (NIX$_{LFT}$) assigning 'Amsterdam' a location (signer's left) for subsequent agreement, a 1st person pronoun (IX$_{1}$) subject of the null copula, and a locative index (LIX$_{LFT}$) resuming the position of Amsterdam, thus meaning 'there (in Amsterdam)'. The noun and its NIX are set apart from the rest of the sentence by means of the topic nonmanual marker and a possible intonational break represented by a comma (**,**). This can be easily observed when the sentence is signed slowly, but it may be more difficult to perceive when signing is quicker. The person who sees the sentence infers that a null copula 'to be/ have been' accompanies the left-pointing locative index, thus conveying the idea of '(being) there', even though no specific sign 'to be' is used.

                top
30. AMSTERDAM NIX$_{LFT}$ **,** IX$_{1}$ LIX$_{LFT}$ NEVER   [LIS]
    '(As for) Amsterdam, I (have) never (been) there'

Copula constructions are not analyzed in this dissertation, but the reader must be aware null copulae may occasionally occur in the examples. As in the case of spoken languages, the possibility to determine the function

and then the order of signs depends on recognizing also elements which are not phonetically realized (i.e. not visually realized).

2.1.2 Quantifiers, possessives and "higher adjectives"

This section describes a group of elements, i.e. quantifiers, possessives, and adjectives like OTHER, PAST/PREVIOUS, NEXT/FOLLOWING, which are postnominal in LIS, but consistently prenominal in NGT. This is one of the first instances of crosslinguistic variations found during this comparison. Data show that quantifiers like ALL or MANY follow the noun in LIS (31.a), (32.a), but precede it in NGT (31.b), (32.b). Thus, LIS has the order **N**oun – **Q**uantifier, while NGT displays the order **Q – N**.

31.
    a.   CAR EXPENSIVE ALL**,** NICE   [LIS]

    b.   ALL CAR EXPENSIVE**,** NICE   [NGT]
        'All expensive cars are nice'

32.
    a.   IX$_1$ APPLE MANY EAT   [LIS]
        'I eat/ate many apples'

    b.   [NGT: Gids 3.0, Manuele basisel. 8/40]
        PLACE, MANY OTHER SIGN SPECIAL PLACE HAVE
        'Many other signs have a special place'

Possessives, too, show a different distribution in the two languages: for instance, to express "my brother", NGT (33.b) uses a prenominal possessive index (PIX), while LIS (33.a) has a postnominal PIX. Thus, LIS shows the order **N – Poss** and NGT has **Poss – N** (the NIXes that appear in the sentences are discussed in §2.2.3).

33.
      <u>   **top**   </u>
  a. BROTHER PIX$_1$ NIX$_{RGT}$ THIS^EVENING IX$_{RGT\ RGT}$VISIT$_1$ [LIS]
    'My brother, tonight he is visiting me'

  b. <u>   **top.**   </u>   [NGT: repeated from (27.a)]
    PIX$_1$ BROTHER NIX$_{RGT}$ THIS^EVENING IX$_{RGT\ RGT}$VISIT$_1$
    'My brother, tonight he is visiting me'

Both LIS and NGT distinguish different forms of possessives. Some PIXes are performed so close to the noun that no prosodic break is observed. Moreover, they cannot be used with a predicative function. For this reason they appear to be possessive suffixes (as attested in Hungarian, Turkish, Kazakh, for instance) or clitics [16], rather then stand-alone possessive pronouns. In contrast, other possessives are somehow emphatic (they can be also used predicatively, but I will not discuss predicative possessive constructions here). These emphatic or "strong" genitive forms have a special B-hand configuration ( ) in LIS. LIS has also another type of possessives. These have a G-handshape ( ), but have a rotation of the wrist instead of the pointing movement. However, the linear ordering of these possessives in the sentence is the same as that of their nonstrong counterpart. Also, even though strong possessives do not involve a pointing movement of the index finger, they are indexes in that they point to spatial locations associated with person (see the LIS examples (34.a) and (34.b) where both signs are postnominal).

34.

  a. JACKET PIX$_1$ [LIS]
    'my jacket'

  b. JACKET PIX-STRONG$_1$ [LIS]
    'my jacket'

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[16] Often, the "fusion" of one sign with another sign is described as cliticization. This can certainly be the case, but, in principle, the sequence NOUN+IX could be understood also as the counterpart of NOUN+SUFF, in my opinion. Compare, for instance, Kazakh *dos* ('friend') and *dos-im* ('my friend') (Raushan Kondybayeva, p.c.).

NGT can encode emphasis by reduplicating the prenominal possessive index. Thus, when I requested a native signer to translate two sentences from Dutch into NGT which involved the difference between the possessive *je* ('your') and the strong possessive *jouw* ('your(emph.)'), she produced the minimal pair (35.a), (35.b). Both possessive indexes are prenominal and have the same hand configuration. However, the strong PIX in (35.b) is reduplicated. (At present, it is unclear to me whether reduplicated strong possessives are also available in LIS.)

35.

    a.   YESTERDAY IX$_1$ PIX$_2$ MOTHER SEE   [NGT]
       'Yesterday I saw your mother'

    b.   YESTERDAY IX$_1$ PIX$_2$++ MOTHER SEE   [NGT]
       'Yesterday I saw *your* mother'

Thus, as suggested by the comparison between (34.a), (34.b) and (35.a), (35.b), the different types of possessives occupy the same position within each single language, but different linear positions in the two languages.

    Higher adjectives, such as OTHER, PAST/PREVIOUS, NEXT/FOLLOWING also display a different ordering in LIS and NGT. I use the label "higher" because these adjectives usually precede other adjectives in head-initial languages (e.g. *other nice books* vs **nice other books*), thus suggesting that they may be located higher in the structure. As far as I can see, these signs fulfill the same function in LIS and NGT despite their being glossed with different words in Italian and Dutch. Thus LIS PAST (Ital. PASSATO) works as NGT PREVIOUS (Dutch VORIG) and LIS NEXT (Ital. PROSSIMO) works as NGT FOLLOWING (Dutch VOLGEND). Again, according to the informants, these elements follow the noun in LIS (36.a), (37.a), (38.a), while they precede it in NGT (36.b), (37.b), (38.b). In that respect, the NGT sign order is similar to that of Dutch, whereas LIS has a sign order different from NGT, Dutch and also Italian.

36.

    a.   EXAMPLE PAST   [LIS]

    b.   PREVIOUS EXAMPLE   [NGT]
       'previous/last example'

37.
  a. EXAMPLE NEXT, EASY   [LIS]
      'The next/following example is easy'

  b.   [NGT: Gids 3.0, manuele basisel. 39/40]
      LOOK FOLLOWING EXAMPLE++
      'Look at the next/following examples'

38.
  a. APPLE DIX GOOD. APPLE OTHER BETTER   [LIS]
      'This apple is good. (But) The other apple is better'

  b.   [NGT: Gids 3.0, congruentie –inleid. 11/13]
      OTHER EXAMPLE TO-LOVE
      'An/the other example is "to love"'
      (while describing two examples)

Due to crosslinguistic variation, a comparison is not always possible. In particular, LIS has some forms where the adjective appears to be incorporated into the noun resulting in a change in movement (forward=future, backward=past). For instance, in (39.a) the sign WEEK moves forward to indicate future and moves backward to indicate past. NGT in (39.b) employs specific signs, instead. It is therefore not possible to compare the two sign orders.

39.
  a. WEEK$_{FORW}$ / WEEK$_{BACKW}$ [LIS]

  b. FOLLOWING WEEK / PREVIOUS WEEK   [NGT]
      'next week / last week'

However, even in this case, the LIS adjectives do not appear before the noun. In conclusion, I have observed no A-N sequences in LIS, while I have encountered some in NGT.

2.1.3 Demonstratives and locatives

Even though LIS and NGT do not have (in)definite articles, they do have demonstrative indexes (DIX), as mentioned in §2.1.1. They also have locative indexes (LIX) which, as also observed in some spoken languages, may optionally accompany the demonstrative. Because both demonstratives and locatives are often represented as indexes, it is not always easy to distinguish the former from the latter. The description is further complicated by the fact that the two languages have two different sign orders. For example, considering only demonstratives for the moment, an unmarked demonstrative compatible with an anaphoric use is postnominal in LIS (40.a), but prenominal in NGT (40.b), according to the judgement of informants. Although both (40.a) and (40.b) are a grammatical continuation of (40), they clearly involve different sign orders:

40. YESTERDAY IX$_1$ BOOK OLD BUY …
    'Yesterday I bought an old book'

    a.   BOOK DIX$_{LFT}$ (,) EXPENSIVE   [LIS]

    b.   DIX$_{LFT}$ BOOK (,) EXPENSIVE   [NGT]
         'That book was/is expensive'

The orders of the two languages differ also when demonstrative indexes co-occur with locative indexes (such as in English 'that book there'). In LIS (41), both elements are postnominal, though they may have distinctive forms. The demonstrative may appear in a special strong form PE[17], suggesting that the second index is possibly a locative (although Bertone's Italian translation does not contain a locative).

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[17] The sign PE, which has the 1-handshape or G-handshape of indexes (☝), but a different movement and orientation, will be discussed in §5.1 and §5.2, since different analyses have been proposed for it. However, although these accounts do not agree on its exact status, none of them considers it as a locative.

41.   [LIS: adapted from Bertone 2007:153]

                 <u>   dp   </u>   <u>   neg.   </u>
     ACQUA 'PE' IX BERE BUONA NEG
     water   PE IX drink good not
     'This water is not good for drinking'

In LIS two indexes can also be articulated with two hands simultaneously. Informants judged (42), for example, to be grammatical, albeit marked. It contains an emphatic, reduplicated index on the dominant hand (which can also be marked for plural by a circular movement) and an invariant one on the nondominant hand. This again suggests that the reduplicated, inflectable, emphatic form is the determiner, namely a demonstrative, and, by exclusion, that the second index is a locative. In this case, then, the distinct functions of the two indexes are more evident, despite their simultaneous realization.

42. BOOK DIX++   *(dominant hand)*   [LIS]
       LIX   *(nondom.hand)*
   'that book there / that there book'

In contrast, NGT (43) uses a prenominal index and a postnominal one. According to Vink (2004), the prenominal index is the demonstrative and the postnominal one is the locative.

43. DIX$_{LFT}$ BOOK LIX$_{LFT}$ (,) EXPENSIVE   [NGT]
   'That book was/is expensive'

NGT has also some constructions displaying only a postnominal index as in (44.a). On the basis of NGT (43), the postnominal index of (44.a) can be safely considered a locative, comparable to English (44.b), but accompanied by a null article (recall that definite articles are observed in neither NGT nor LIS). Accordingly, I gloss the postnominal index in (44.a) as LIX, like in (43).

44.

    a.   BOOK LIX_{LFT} (**,**) EXPENSIVE   [NGT]
       '(The) book there, is/was expensive'

    b.   The book there is expensive   [Engl.]

The data give rise to some discussion because the NGT postnominal index can sometimes inflect for plural and is thus better analyzed as a demonstrative, since locatives, as argued above, do not have a plural form. In this case, then, the NGT postnominal index behaves just as its LIS counterpart. Thus, both LIS (45.a) and NGT (45.b) have a postnominal plural demonstrative agreeing with the plural-marked noun. In LIS, I gloss it as a DIX (with the arc plural movement and a left-side location). As for NGT, I maintain Vink's gloss, which is simply IX (with an arc plural movement). Notice also that Vink's translation does not treat this IX as a demonstrative either, but renders the sentence in Dutch with the definite article *de* ('the'). However, according to Vink herself, definite articles do not exist in NGT. Thus, neither being a locative (it is plural) nor a definite article, the IX of (45.b) is likely to be a DIX.

45.

    a.   CHILD_{LFT}++ DIX$_{LFT}^{ARC}$ PLAY   [LIS]
       'Those children play(ed)/are/were playing'

    b.   [NGT: adapted from Vink 2004:35]
       VANDAAG,   KIND++ IX^{ARC} DRUK
       today,   children IX-PL very busy
       'Today the children are very busy'

Taken together, the data indicate that demonstratives occupy different positions in the two sign languages considered here. LIS has a **N-Dem** order and NGT has both **N-Dem** and **Dem-N** orders. Locatives are always postnominal in both languages: **N-Dem/Loc**[18] (maybe **N-Dem-Loc)** in LIS, and **Dem-N-Loc** in NGT. Data also show that in both

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[18] I use a slash between two or more elements when I have not been able to determine their linear order for certain, either because different linearizations appear or because the elements considered are realized simultaneously.

languages demonstratives are able to agree in number with plural nouns. The ambiguous behaviour of NGT, which oscillates between constructions with prenominal demonstratives and constructions with postnominal ones, will be discussed in the second part of this chapter. However, one remark must be made here. Although a "floating" demonstrative may seem surprising, demonstratives which alternate between a prenominal and a postnominal position are also observed in spoken languages. For instance, Spanish allows for both prenominal demonstratives, as in (46.a), and postnominal demonstratives, as in (46.b). A locative can optionally appear and its position is always postnominal in Spanish, as it is in LIS and NGT.

46.
  a. Este libro de aquí…   [Sp.: Brugè 2002:25]
     this book (of here)

  b. El libro este de aquí…   [Sp.: Brugè 2002:25]
     the book this   (of here)
     'this book (here)'

Since we find such similarities, the analysis proposed in the second part of this chapter for such crosslinguistic and intralinguistc variation in sign languages will be based upon theories developed for spoken languages.

2.1.4 Numerals and adjectives

LIS and NGT pattern alike with respect to the agreement between nouns and numerals: in both languages, nouns (that allow for pluralization) are marked for plural even when a numeral or a quantifier appears. This is not a trivial observation, since there *are* languages, such as Hungarian, for instance, where nouns retain the singular form when accompanied by numerals, even though the plural is available, in principle. In contrast to LIS and NGT, DGS nouns always retain their base form when they are accompanied by a numeral or a quantifier (Pfau & Steinbach 2006) (see examples (47) and (48))[19].

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[19] The LIS plural noun CHILD++ displays a sort of continuous movement, so that it is not possible to say exactly how many times it is repeated. However, what is crucial here is that the LIS noun does show some overt plural marking in contrast to its DGS counterpart.

47.

    a.   CHILD++ MANY   [LIS]
       'many children'

    b.   MANY CHILD   [DGS: Pfau & Steinbach 2006:170]
       'many children'

48.

    a.   …IX THREE BOOK++ READ   [NGT: Gids 3.0, meervoud, 7/29]
       'I have read three books'

    b.   FIVE BOOK   [DGS: Pfau & Steinbach 2006:170]
       'five books'

Although both LIS and NGT inflect the noun when it is accompanied by an element that indicates plurality (numeral or quantifier), they show some difference in the order of signs. The possible relation between linear order and agreement is entailed in the analysis proposed in the second part of the chapter. In LIS, numerals and adjectives follow the noun consistently (though possibly varying their position with respect to each other), while in NGT, a wider variation is observed. In fact, NGT numerals and adjectives seem to be able to appear either before or after the noun.

    Let us start with adjectives: both languages exhibit **N-A** sign order in (49.a), (49.b) and (50.a), (50.b).

49.

    a.   MAN OLD BOOK IX BUY   [LIS]
       'The old man buys/bought the book'

    b.   MAN   OUD   BOEK   KOPEN   [NGT: Baker 2008:25]
       man   old   book   buy
       'The old man buys the book'

50.
    a.   IX$_1$ PEN RED BUY   [LIS]
       'I bought a/the red pen'

    b.   YESTERDAY IX$_1$ PEN RED BUY   [NGT]
       'Yesterday I bought a red pen'

However, occasionally NGT can also display the order **A-N**[20]: the same informant who signed (50.b) also signed (51).

51. RED PEN YESTERDAY IX$_2$ $_2$GIVE$_1$ TODAY FALL…   [NGT]
    'The red pen you gave me yesterday today has fallen…'

    Also, numerals are consistently postnominal in LIS, while they can be either postnominal or prenominal in NGT, according to the data that I have collected. In (52.a), (52.b) both languages display the order **N-Num**.

52.
    a.   IX$_1$ BOOK THREE EXIST   [LIS]
       'I have three books'

    b.   PEN TWO IX$_{RGT}$, BOTH$_{RGT}$ NICE   [NGT]
       'The/those two pens, they are both nice'

However, NGT can also display a prenominal numeral, i.e. **Num-N** order, as in (53).

53. …IX THREE BOOK++ READ   [NGT: Gids 3.0, meervoud 7/29]
    'I have read three books'

I have not been able to detect whether intralinguistic variation attested in NGT depends on influence from spoken Dutch (which has a Num-A-N word order), on local varieties of the sign language, or on other factors.

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[20] Roland Pfau points out that this optionality of NGT might be related to special properties of colour adjectives (as in French). However, the same variation affects NGT numerals (see below). Unfortunately, I have not been able to detect the reason for this variation.

The N-Num order observed in LIS, in contrast, cannot be ascribed to influence of Italian since Italian has prenominal numerals. However, generally speaking, the possibility of having alternative orders within a single language is attested at least in one other sign language (Taiwan SL, Zhang 2007) as well as in Spanish (see §2.1.3) and other spoken languages (Cinque (2000, 2005a) and references therein). For example, Cinque (2005a), referring to Croft & Deligianni (2001), lists Dem-N-Num-A as alternative to Dem-N-A-Num in Hualapai and Lahu. As will become clear in the second part of the chapter, such variation does not affect the analysis proposed.

2.1.5 Combinations of DP-related elements

Having discussed the position of specific DP-elements with respect to the noun in separate paragraphs, I will now turn to different combinations of these elements. Also, quantifiers are considered, which sit above DP (Giusti 1993; Giusti & Cardinaletti 2005). It is difficult (if not impossible) to observe the co-occurence of all the elements described above in one and the same sentence. However, partial combinations of these elements can be observed and exploited to reconstruct the whole hierarchy of DP-internal signs in LIS and NGT. Recall that in both sign languages the whole DP can, but need not, be separated from the predicate by an intonational break (**,**) and a "raised eyebrows" nonmanual marker indicating that it is topicalized.

In §2.1.2, I showed that LIS quantifiers, possessives, and high adjectives OTHER/NEXT/PREVIOUS are postnominal. Interestingly, some of them can co-occur. For instance, in LIS (54.a), the quantifier follows the possessive, which in turn follows the noun resulting in a **N-Poss-Q** order. In NGT, for some reason, informants rejected the co-occurence of quantifiers with possessives and high adjectives, but all of them are prenominal. Thus, in NGT (54.b), only a prenominal quantifier is observed, although in (55.c), the quantifier MANY does co-occur with OTHER.

54.

                  <u>   top </u>

a.   FRIEND(S) PIX$_1$ ALL **,** (IX$_3$^{ARC}) DEAF   [LIS]

           <u>   top   </u>

b.   ALL FRIEND **,** DEAF   [NGT]

    'All my friends are deaf'

In principle, the fact that the LIS quantifier appears at the end of the DP and close to the predicate may lead to ambiguity. If the quantifier falls inside the DP, we have a reading like (54.a) 'all my friends are deaf'. However, if it falls outside the DP, a "floating quantifier" interpretation arises such as 'my friends are all deaf'. This happens because LIS and NGT do not have an overt copula. Such facts will not be discussed further in this dissertation, but it is interesting that the ambiguity is resolved in LIS (54.a) by the presence of the nonmanual marker and the optional (plural) resumptive pronoun, which separates the DP from the predicate. Also an intonational break may be observed, as in the examples above. In NGT, in contrast, only a quantifier falling outside the DP is necessarily postnominal and the linear order of the signs is thus sufficient to recognize the difference.

    Bearing this in mind, one can now observe the position of some higher adjectives inside the DP, such as 'other', with respect to quantifiers and nouns. In (55.b), NGT informants seem to allow only the adjective OTHER (even if asked to translate "all other"[21]). However, in (55.c), OTHER co-occurs with the quantifier MANY, and NGT thus shows the order **Q-OTHER-N**, opposite to the **N-OTHER-Q** order of signs of LIS (55.a).

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[21] The context given was "I have one hearing friend" (all other friends are deaf).

55.

    a. $\underline{\hspace{3cm}\text{top}\hspace{1cm}}$ [LIS]

         FRIEND(S) OTHER ALL **,** (IX$_3$^{ARC}) DEAF

    b. $\underline{\hspace{2cm}\text{top}\hspace{0.5cm}}$ [NGT]

         OTHER FRIEND **,** DEAF

         'Other friends are deaf'

    c.   [NGT: repeated from (32.b)]

         PLACE, MANY OTHER SIGN SPECIAL PLACE HAVE

         'Many other signs have a special place'

As for the higher part of the DP, then, it can be safely concluded that LIS has the mirror order of NGT. NGT, as already observed in §2.1.2, has the same linear order of prenominal elements as English and Dutch (and Italian, to a minor extent). However, while higher adjectives as OTHER seem consistently prenominal in NGT, other NGT adjectives are able to occur also in postnominal position, just like in LIS, as described in §2.1.4. For instance, in both LIS (56.a) and NGT (56.b), the adjective EXPENSIVE is postnominal. Due to the different position of quantifiers, the complete order is **N-A-Q** in LIS (56.a) and **Q-N-A** in NGT (56.b).

56.

    a.   CAR EXPENSIVE ALL**,** NICE   [LIS]

    b.   ALL CAR EXPENSIVE**,** NICE   [NGT]

         'All expensive cars are nice'

As shown in §2.1.4, not only NGT adjectives (other than higher ones) can be either pre or postnominal, but also NGT numerals can either precede or follow the noun. This intra-linguistic variation is observed, too, when these adjectives and numerals are combined. Thus, the order **N-A-Num** is grammatical in both LIS (57.a) and NGT (57.b), but in addition, NGT allows for the order **Num-A-N** in (58).

57.

    a.   [LIS: adapted from Bertone 2007:123]

                                   dp

      LIBRO   ROSSO   TRE   CL+++ **,** PIX$_1$-STRONG

      book   red   three CL-TRIPL (are) my

      'The three red books are mine'

    b.   PEN RED TWO TABLE$_{RGT}$ BE^PRESENT$_{RGT}$ [NGT]

      'There are two red pens on the table'

58. PIX$_1$ THREE RED CAT^LITTLE, IX NICE   [NGT]

    'My three red kittens are nice'

LIS, in contrast, may change the order of numeral and adjective (59.a), (59.b), but both remain postnominal. It seems, however, that the order **N-A-Num** is the preferred one. No differences appear in Bertone's "dp" NMM.

59.   [LIS: adapted from Bertone 2007:84]

    a.

                                    dp

      LIBRO   NUOVO   DUE   DIX **,** PIX$_1$-STRONG

      book   new   two   DEM (are) my

    b.

                                    dp

      LIBRO   DUE   NUOVO   DIX **,** PIX$_1$-STRONG

      book   two   new   DEM (are) my

      'These two new books are mine'

Consequently, LIS is more consistent than NGT in having neither numerals nor adjectives in prenominal position. The two languages diverge even more if demonstratives and possessives are taken into consideration. LIS possessives precede the adjective, hence the numeral, but follow the noun resulting in **N-Poss-A** sign order, as in (60). In contrast, NGT possessives precede numerals and adjectives and are also

prenominal, thus yielding the **Poss(-Num)-A-N** sign order of (61) and (62). LIS (60) is a grammatical answer to the question "What are you looking for?". NGT (61), constructed by adding an adjective to (27.a), was judged grammatical, and NGT (62) is repeated from (58).

60. *(What are you looking for?)*
    BOOK PIX**1**-STRONG RED   [LIS]
    'my red book'

              _____ top _
61. PIX**1** OLD BROTHER NIX**LFT** , THIS^EVENING IX**LFT LFT**VISIT**1**   [NGT]
    'My old brother, tonight he is visiting me' (I have two brothers)

62. PIX**1** THREE RED CAT^LITTLE, IX NICE   [NGT: repeated from (58)]
    'My three red kittens are nice'

Prenominal NGT demonstratives also precede adjectives, while LIS postnominal demonstratives also follow adjectives and numerals. Thus, LIS has a N-A-Num-Dem and N-Num-A-Dem sign order in (59.a) and (59.b), with the **N-A-Num-Dem** of (59.a) as possibly unmarked order. Example (59.a) is repeated here as (63). NGT, in constrast, shows a **Dem-A-N** sign order in (64)[22].

63. _____ dp _   [LIS: repeated from (59.a)]
    LIBRO   NUOVO   DUE   DIX , PIX**1**-STRONG
    book   new   two   DEM (are) my
    'These two new books are mine'

64. _____ top _   [NGT]
    DIX**LFT** OLD BOOK IX**LFT** , IX**LFT** SUPER
    'That/This old book is super/very good'

A similar, albeit not identical, variation is observed in Spanish, as mentioned in §2.1.3. Recall that in Spanish the demonstrative can be either pre- or postnominal. If the demonstrative is prenominal, it precedes

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[22] In (64), I have not specified the status of the postnominal index. In principle, it could be a LIX, as in (43), or a NIX as in (27) and (61).

both noun and adjective, as in (65.b). If it is postnominal, it also follows the adjective, as in (65.b).

65.

  a. Este libro   gordo…   [Sp.: Brugè 2002:42]
     this book   big

  b. El   libro   gordo   este   [Sp.: Brugè 2002:42]
     the book   big   this
     'this big book'

Again, the discussion of LIS and NGT demonstratives and locatives will rest upon such similarities between signed and spoken languages. Especially, the fact that the distinct orders, similar to those of LIS and NGT, are attested in a single spoken language suggests that across languages, the distinction between prenominal and postnominal elements must not necessarily be explained in terms of two distinct deep structures, i.e. head-initial vs. head-final. It also suggests that the rules of linearization are modality-independent. In other words, modality may allow for the simultaneous realization of some elements, but, if they are linearized, the same linearization rules apply crossmodally.

As for the combination of demonstratives and possessives, these are able to co-occur in LIS since, according to Bertone (2007: 167), demonstratives follow all other DP-related signs, included possessives. The LIS order of signs is **N-Poss-A-Dem**. In fact, the LIS sentence (66) is grammatical and contains an index translating the idea of "that". I have no available data on the co-occurence of demonstratives and possessives in NGT.

66. $\underline{_{top}}$ [LIS: Bertone, p.c.]
   BOOK PIX$_1$ RED DIX$_{LFT}$ **,** UNCLE IX$_1$ $_3$GIVE^AS^PRESENT$_1$
   'That red book of mine, my uncle gave it to me / is a present by my uncle'

2.1.6 Summary

The data that I have collected indicate that with respect to linear order within the DP, there is more variation in NGT than in LIS. Also quantifiers behave differently in the two languages. As a general rule,

NGT seems to distinguish a clearly "prenominal category" including quantifiers, higher adjectives, and possessives, and a more "flexible category" of elements which may occupy a prenominal or a postnominal position. These "floating" elements include numerals, adjectives and, to a lesser extent, demonstratives. The only NGT element which is consistently postnominal (when it appears) seems to be the locative index. LIS, in contrast, shows a more restrictive and more consistent pattern in that all its DP elements are postnominal[23] and follow a fixed linear order. In conclusion, the following properties have been observed:

- LIS has not only the **N-A-Num-Dem/Q** sign order, but also the orders **N-Dem/Loc** and **N-Poss-A-Dem** are observed.
- NGT displays the **Dem-(A-)-N-(Loc)** sign order, the **Poss(-Num)-A-N** sign order, and sometimes a postnominal demonstrative with **N-Dem** order. The variation **Num-A-N / N-A-Num** is also often observed.
- Quantifiers and possessives appear in the order **N-Poss-Q** in LIS and **Q/Poss-N** in NGT. Likewise, quantifiers and higher adjectives OTHER, NEXT/FOLLOWING, PAST/PREVIOUS are postnominal in LIS, while they are prenominal in NGT. OTHER appears in the order N-OTHER-Q in LIS. In NGT, it appears in the order Q/OTHER-N, or in the order Q-OTHER-N if the quantifier MANY is used for Q.

Thus, although it is very difficult to observe all these elements occurring simultaneously in one sentence, the partial combinations seen above point toward a LIS unmarked order of signs as in (67) and an NGT ordering as indicated in (68).

67. LIS ordering: **N-Poss-A(-Num)-Dem/Q/Loc**

68. NGT ordering: **Q/Other/Poss/Dem – (N-Num-A)/(A-Num-N) – Loc**

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[23] Bertone (2007) reports only one element in LIS, rarely used, which may appear in prenominal position: a very short and weak index. This might be evidence that it is a head-like, unstressed version of a demonstrative, i.e. possibly a definite article sitting in D° (cf. Italian *il* 'the' ← lat. *il[lum]* 'that', Dutch *de* 'the' vs. *die* 'that/those'). If this were true, it would indicate that LIS is on its way to develop a definite article as various spoken languages did. However, more data are required to propose a reliable analysis of this fact. I will not further discuss it here.

Some of these (partial) orders have been seen to follow patterns observed also in spoken languages (e.g. Spanish). In addition to this, Zhang (2007) discusses some combinations of adjective, numeral, and demonstrative in Taiwanese Sign Language and shows that, although they appear in different orders, only some sequences are grammatical. Other similarities between sign and spoken languages will be pointed out in the second part of this chapter. These facts are important for two reasons. First, they show once again that sign languages are clearly subject to well-defined language-specific grammatical rules and do not combine signs freely in "pantomimic" sequences. Secondly, they allow us to extend to sign languages the analyses developed for the crosslinguistic and intralinguistic variation of spoken languages. In the following section, I will thus propose an analysis for these different orders, also building on the fact that similar variation is observed in spoken languages. In addition to this, both LIS and NGT display also some postnominal location-assigning elements, here glossed NIXes, which appear to have no clear counterpart in spoken languages and which serve to associate the noun with a location employed for agreement. I shall attempt to include these elements in the analysis.

2.2 Analysis

2.2.1 Introduction

The crosslinguistic variation between LIS and NGT may be surprising for people who usually expect sign languages to be "all the same". Especially, the intralinguistic variation displayed by NGT may be puzzling, since it apparently allows for a number of different sign orders, while LIS more consistently has one unmarked fixed order of signs. It is important to bear in mind that the observations about sign order in NGT are somewhat less exact since I have not been able to observe the co-occurence of some elements which, instead, do co-occur in LIS. However, comparing the two sign languages, one observes that their variation is not random. Rather, specific patterns emerge that are compatible with the variation attested in spoken languages. Also, the intralinguistic variation observed is similar to phenomena described for spoken languages. This suggests that different, sometimes opposite, orders may not necessarily imply different deep structures.The fact that this cross- and intralinguistic

variation occurs in both sign languages and spoken languages, does not only prove that (the faculty of) Language has its own abstract rules independent from the modality in which it surfaces, but also allows us to extend to LIS and NGT the theoretical tools developed for the analysis of the DP of spoken languages.

In the split-DP structure that gradually developed following Abney's (1987) seminal work, determiners, adjectives and numerals are assumed to have their own dedicated projections. The highest head in the DP domain, D°, is related to definite articles. Below it, projections NumP and AP(s) host the numeral and possible adjectives. Universal quantifiers such as 'all', according to Giusti (1993) and Giusti & Cardinaletti (2005), are the head Q° of a quantifier phrase QP which is above DP[24]. This assumption captures the fact that universal quantifiers very often precede definite articles, e.g. English '*all the* books that you read'. Demonstratives, in contrast, sit below DP, according to Giusti (1993, 1997) and Brugè (2002), thus accounting for sentences in which the demonstrative follows the definite article, as Spanish *el libro este* (lit. 'the book this'). Likewise, the fact that NumP is lower than the article accounts for those sequences in which the numeral follows the determiner (and possibly the quantifier), e.g. Engl. '*the three* books that you read' and '*all those three* books'. Finally, APs lower than NumP account for the fact that adjectives follows the numeral which in turn follows the determiner and the quantifier, e.g. '*three nice* books', '*the/those three nice* books', and '*all those three nice* books'. Giusti (1993) assumes that demonstratives are generated below DP, while Giusti (1997) and Brugè (2002) assume that they are generated lower, near the noun. For the purpose of this dissertation, I will not address this question, but I will take at least one agreement position to exist between the demonstrative and DP while sticking to Cinque's (2000, 2005a) hierarchy, discussed in §2.2.2. Movement of the noun within DP is advocated, among others, by Longobardi (1994), who shows that all nouns in argumental position require a DP and that the noun raises overtly to DP in Italian for referential reasons when no determiner appears. This happens with personal proper names, some kinship terms, and some

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[24] Giusti (1993) assumes articles to sit in the head F° of a functional projection which subsumes the functions of DP and Case projection: «...fonderemo su motivazioni funzionali e tipologiche l'assunto di una proiezione FP in cui è assegnato e realizzato il Caso...e sosterremo che la proiezione DP è completamente sussunta da FP» (p.44).

common noun such as *casa* ('house') or *camera* ('room')[25]. Longobardi argues for N to D raising, while Cinque's analysis is centered on NP movement. However, both analyses demonstrate, with different arguments, the necessity and the possibility that the noun raises within the DP.

Szabolcsi (1994) discusses the raising of the possessor in the Hungarian DP and argues in favour of a parallelism between DP and CP. In an antisymmetric model, the order of the projections within DP/QP must be the same in all languages, as also suggested by the fact that alternative orders may occur in a single language (recall the facts from Taiwan SL and Spanish along with NGT in §2.1.4). In the following analysis, I will try to verify whether the orders of LIS and NGT can be derived from one and the same antisymmetric DP structure, as proposed by Cinque (2000, 2005a). §2.2.2 analyzes the ordering of adjectives, numerals, demonstratives, and locatives. §2.2.3 discusses the presence and the position of possessives and proposes a temptative account for location-assigning indexes. In §2.3 general conclusions are drawn about the DP of the two sign languages, also in comparison to that of spoken languages.

2.2.2 Structure of DP/QP: deriving the position of determiners, quantifiers, numerals, adjectives

Cinque (2000, 2005a) assumes one universal hierarchy of projections, sketched in (69), which accounts for the crosslinguistic variation in the linear ordering of noun-related elements:

69. Q…Dem…Num…A (…N)

Cinque takes the hierarchy in (69) as the universal merge order of elements briefly discussed in §1.2.4. He then derives other orders through subsequent pied-piping remnant movements which raise maximal projections leftwards and invert chunks within the DP. This choice, consistent with Kayne's antisymmetry model, accounts for the fact that some word orders are never observed in natural languages. For example,

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[25] Compare, for instance, *la mia camera* (lit. 'the my room') and *camera mia* (lit. 'room my') both meaning 'my room'. This can be extended also to *macchina* ('car'), at least in some varieties. For instance: (Where is my umbrella?) *Nella mia macchina / In macchina mia* (lit. 'In the my car / In car my' (i.e., in my car)).

in Cinque's (2005a) list of attested and unattested orders across the languages of the world, the following asymmetries can be observed. While the two opposite orders in (73) are both attested across languages, other orders do not have an attested opposite, as in (70)-(72).

70. **N – Dem – Num – A** vs ***A – Num – Dem – N**

71. **N – A – Dem – Num** vs ***Num – Dem – A - N**

72. **A – N – Dem – Num** vs ***Num – Dem – N – A**

73. **Dem – Num – A – N** *and* **N – A – Num – Dem**

If the merge order were free, there would be no reason why some orders are excluded and others are attested. In contrast, the fact that (partially) inverse word orders are derived by (partial) raisings relates the absence of some word orders to the impossibility of deriving them through movement from the only available universal basic order. The starting point of this analysis of LIS and NGT is the assumption that their linear order of DP-internal signs conforms to Cinque's derivation. Although Cinque's proposal is based mainly on the observation of spoken languages, the Dem-Num-A-N universal structure has successfully been applied to the sign order of LIS (Bertone 2007). The aim here was to confirm Bertone's proposal for LIS and to test NGT. In addition, I will discuss the distribution of quantifiers, possessives, and locatives in both LIS and NGT. This will be done on the basis of two other assumptions: first, Cinque's (2000) proposal for a genitive projection between adjective and noun to account for genitive and construct states in different spoken languages; second, Brugè's (2002) proposal that the demonstrative is part of a maximal projection which also contains an optional locative.

As seen in the previous section, the usual sign order of LIS is **N-A-Num-Dem/Q**: this is exactly the mirror order of the universal order of merge (69) proposed by Cinque. Bertone (2007) thus derives the sign order of LIS through successive pied-piping leftward movements of the "whose-picture" type (Cinque 2000, 2005a) which "roll-up" the projections within the DP. First, the noun raises to the left of the adjective. Then noun and adjective raise to the left of the numeral. Finally, noun,

adjective and numeral raise to the left of the demonstrative. In this way, the postnominal order of various LIS elements can be derived. Cinque takes these raisings to target agreement maximal projections located between the projections of demonstratives, numerals, and adjectives. In Bertone's view, the need for the pied-piped constituents to move in LIS is due to the fact that they must reach [Spec;DP], the highest projection of the DP domain, where definiteness is encoded. She notices that the definiteness of the noun is related to the fact that it is articulated in a definite spatial position. Drawing on Longobardi (1994) and Giusti (2005), she proposes that D° hosts the space features ("tratti dello spazio") of the noun and that these are the morphological realization of referentiality and possibly Case, as suggested by the fact that spatial features are used in pronominalization and in verbal agreement with the noun. Bertone also follows Giusti, Brugè and Cinque in assuming that demonstratives, numerals, and adjectives are all generated in the specifiers of functional projections below DP. The fact that LIS has no articles requires then some constituents to fill [Spec;DP] stranding the demonstrative and other elements in the lower, postnominal position.

Thus, following Bertone (and not considering classifiers), successive roll-up movements raise constituents leftwards to (the specifiers of) maximal projections, as sketched in (74). The underscore indicates the specifiers of the agreement projections filled by the raised (inverted) constituent(s). The universal merge order is in (74.a). In (74.b), the noun raises leftwards across the adjective. In (74.c), noun and adjective move across the numeral. In (74.d), noun, adjective and numeral raise across the demonstrative, thus reaching [Spec;DP] in (74.e).

74.

    a. [_{**DP**} D° [_{**AgrZP**} Agr° [_{**ZP**} **D**emP Z° [_{**AgrYP**} Agr° [_{**YP**} **Num**P Y° [_{**AgrXP**} Agr° [_{**XP**} **AP** X° [_{**NP**} **N**]]]]]]]]]

    b. [_{**DP**} D° [_{**AgrZP**} Agr° [_{**ZP**} **D**emP Z° [_{**AgrYP**} Agr° [_{**YP**} **Num**P Y° [_{**AgrXP**} [<u>_{**NP**} **N**</u>] Agr° [_{**XP**} **AP** X° t_{NP}]]]]]]]]

    c. [_{**DP**} D° [_{**AgrZP**} Agr° [_{**ZP**} **D**emP Z° [_{**AgrYP**} <u>[_{**AgrXP**} [_{**NP**} **N**</u>] Agr° <u>[_{**XP**} **AP** X° t_{NP}]</u>] Agr° [_{**YP**} **Num**P Y° t_{AgrXP}]]]]]]

    d. [_{**DP**} D°[_{**AgrZP**} <u>[_{**AgrYP**} [_{**AgrXP**} [_{**NP**} **N**] Agr° [_{**XP**} **AP** X° t_{NP}]] Agr° [_{**YP**} **Num**P Y° t_{AgrXP}]</u>] Agr° [_{**ZP**} **D**emP Z° t_{AgrYP}]]]

    e. [_{**DP**} <u>[_{**AgrZP**} [[[[**N**] Agr° [**AP** X° t_{NP}]] Agr° [**Num**P Y° t_{AgrXP}]] Agr° [_{**ZP**} **D**emP Z° t_{AgrYP}]</u>] D° t_{AgrZP}]

This derivation is represented graphically in figure (75) where only the relevant projections appear.

75. Derivation of LIS sign order **N-A-Num-Dem**
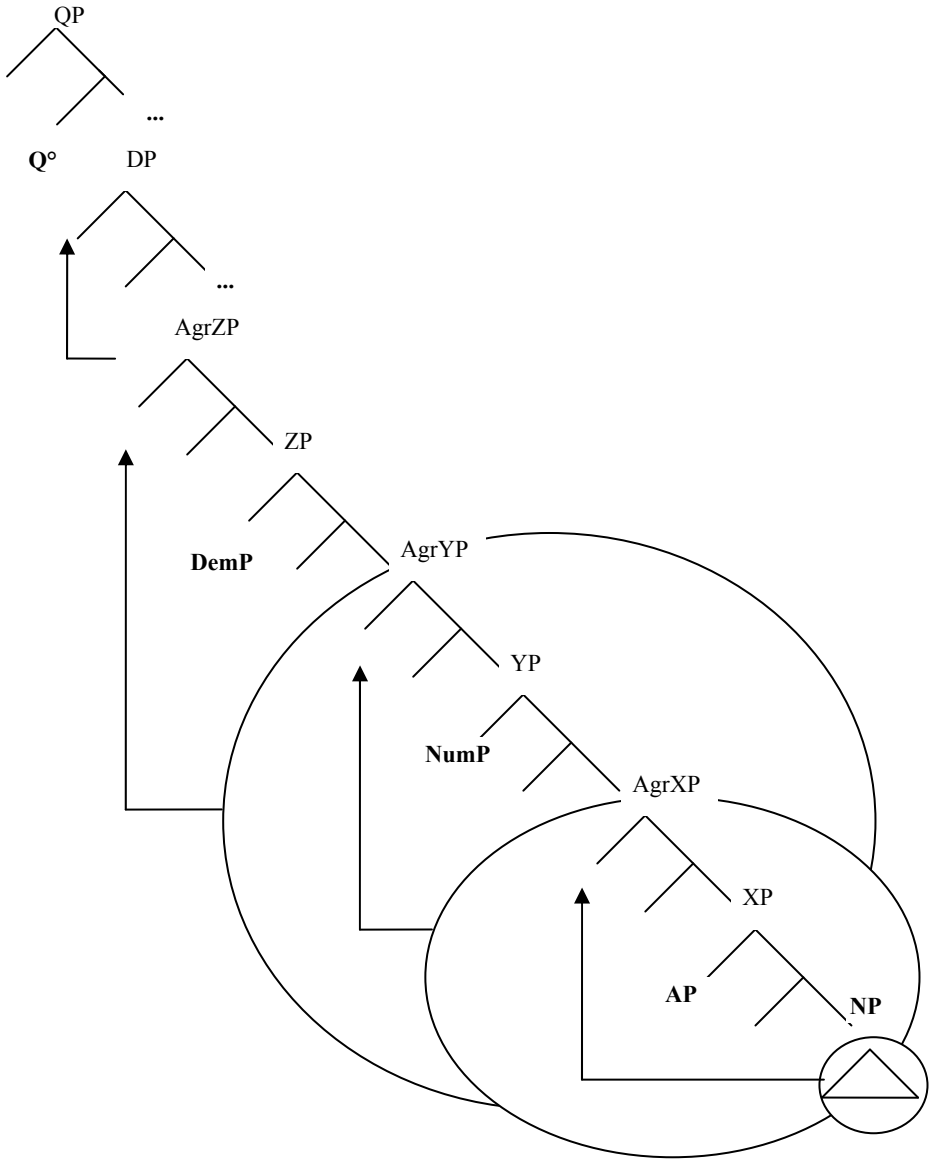
Along the same lines, further pied-pipings raise constituents above the quantifier(s), yielding LIS sentences such as (54.a) and (56.a). Indeed, as seen above, quantifiers sit in Q°, which is above DP. The fact that LIS quantifiers appear postnominally suggests then that pied-pipings do not only move costituents to [Spec;DP], but even higher, above QP. If raisings arrive at DP (and even higher), they should of course be able to affect high adjectives such as 'other', which, according to Giusti (1993), are below quantifiers and articles. Thus, LIS pied-pipings should "roll-up" constituents yielding postnominal higher adjectives followed by quantifiers. N-OTHER-Q inversions such as (55.a) are thus accounted for.

The sign order of NGT, in contrast, is different as inversion affects only (the lower) part of the DP. Concerning this fact, two crucial observations must be made. First, prenominal NGT elements (quantifiers, higher adjectives, and possibly demonstratives, numerals and adjectives) appear in the order **Q/OTHER/Dem-Num-A-N**[26], which is opposite to the **N-A-Num-Dem/Q** order of LIS and very similar to the merge order of (69). This observation is strengthened by the fact that OTHER is ordered as N-OTHER-Q in LIS and Q-OTHER-N in NGT (at least when the quantifier MANY is used). Second, NGT elements which allow for intralinguistic variation in their sign order, like numerals and adjectives, do not have a free distribution, but vary according to specific patterns. When they are prenominal, they appear in the **Num-A-N** merge order of (69). When they are postnominal, they follow the same **N-A-Num** mirror order observed in LIS (where they are also postnominal). This suggests that in NGT, rolling-up pied-pipings occur to a minor extent. If they occur, they are able to invert adjectives and numerals as in LIS, but do neither affect quantifiers nor higher adjectives. Moreover, they only partially affect the demonstrative which can appear either prenominally as in (40.b), (43) or postnominally as in (45.b). Data suggest also that inverting numerals and adjectives in NGT is possible, but not compulsory. Provisionally, one can thus assume the partial derivation in (76) to hold for NGT. In (76.a), the merge order appears; in (76.b), the noun raises across the adjective; and in (76.c), noun and adjective move across the numeral.

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[26] Recall that elements separated by a slash are those for which I have not been able to detect a linear order.

76.

a. [$_{DP}$ D° [$_{AgrZP}$ Agr° [$_{ZP}$ **D**em**P** Z° [$_{AgrYP}$ Agr° [$_{YP}$ **NumP** Y° [$_{AgrXP}$ Agr° [$_{XP}$ **AP** X° [$_{NP}$ **N**]]]]]]]]]

b. [$_{DP}$ D° [$_{AgrZP}$ Agr° [$_{ZP}$ **D**em**P** Z° [$_{AgrYP}$ Agr° [$_{YP}$ **NumP** Y° [$_{AgrXP}$ [$_{NP}$ **N**] Agr° [$_{XP}$ **AP** X° t_{NP}]]]]]]]

c. [$_{DP}$ D° [$_{AgrZP}$ Agr° [$_{ZP}$ **D**em**P** Z° [$_{AgrYP}$ [$_{AgrXP}$ [$_{NP}$ **N**] Agr° [$_{XP}$ **AP** X° t_{NP}]] Agr° [$_{YP}$ **NumP** Y° t_{AgrXP}]]]]]

In line with the fact that postnominal inverted adjectives and numerals are optional in NGT, the inverting pied-pipings in (76) must be considered optional. In this light, the difference between LIS and NGT sign order is reduced to the different extent to which pied-piping with inversion occurs in the two languages. When no pied-piping occurs, the elements appear prenominally and follow the universal merge order as do NGT prenominal numerals and adjectives, for instance. If pied-piping applies, the elements appear postnominally and in the mirror order, as do LIS and NGT postnominal numerals and adjectives. The presence of less extensive pied-piping in (76) also explains why demonstratives are usually prenominal in NGT (40.b), (43). For a similar reason, quantifiers and high adjectives are postnominal in LIS (31.a), (32.a), (36.a), (38.a), but prenominal in NGT (31.b), (32.b), (36.b), (37), (38.b). According to this line of reasoning, the different NGT orders are determined by the same variation in pied-pipings that determines the difference between NGT orders and LIS orders. In other words, the extent of pied-piping does not only vary between LIS and NGT, but also within NGT. Thus, pied-piping may not apply at all (NGT merge order), may apply partially (NGT partially inverted order), or may apply fully (LIS obligatory full inversion).

The possibility that NGT allows some variation in the pied-pipings is not peculiar to sign languages, but is also observed in spoken languages. For instance, according to Cinque (2000), alternative orders appear in Standard Arabic because pied-pipings occur obligatorily across adjectives but optionally across numerals, demonstratives, and quantifiers. However, this partial analysis fails to explain some properties of the NGT demonstrative. First, the demonstrative is usually prenominal in NGT,

but can be accompanied by a postnominal locative, as in the **Dem-N-Loc** order of (43). Second, as already said, the intralinguistic variation of NGT is the cause why even the prenominal position of the demonstrative is sometimes contradicted by the presence of plural postnominal indexes as in (45.b), which cannot be locatives and are therefore demonstratives. Third, what spells out the [+def] features encoded in DP if no article appears in D° and nothing moves to [Spec;DP]? To be able to solve these issues, recall that there are also spoken languages in which the demonstratives alternate between prenominal and postnominal position. Recall the Spanish example (46.a), (46.b) repeated here as (77.a), (77.b) for convenience.

77.

    a. Este   libro   de aquí   [Sp.: Brugè 2002: 25]
       this   book   of here

    b. El   libro   este de   aquí   [Sp.: Brugè 2002: 25]
       the   book   this of   here
       'this book here'

In (77.b), the article co-occurs with both a demonstrative and a locative at the same time, showing that three distinct merge positions are available at the same time. The article is to the left of the noun, while the demonstrative follows the noun, with an optional locative. Crucially, in (77.a), the demonstrative appears to the left of the noun while no article appears. The locative always remains postnominal. Giusti (1997) and Brugè (2002) propose therefore that the article sits in D° and the demonstrative is generated lower than D° together with the (optional) locative, thus accounting for sentences as (77.b). If no article is present in D°, the demonstrative raises leftwards alone to [Spec;DP], thus appearing before the noun and stranding the optional locative in the low merge position, as in (77.a). This analysis can be successfully extended to LIS and NGT, assuming that also in sign languages, the demonstrative is generated with a(n optional) locative and optionally raised.

    In LIS and NGT, indeed, there is no article to check the definiteness feature encoded in D°. The two languages must thus resort to other mechanisms such as filling [Spec;DP] with raised material. They differ depending on what material is raised and on the conditions triggering the

raising. The "pervasive" pied-piping in LIS seen in (74) makes it possible for constituents always to raise to [Spec;DP] (and even higher) and check [+definitess]. In this way, the demonstrative always appears postnominally, as in (45.a), accompanied by an optional locative, as in (42). NGT, in constrast, is more similar to Spanish (77.a) and fills [Spec;DP] by raising only the demonstrative because pied-pipings do not usually reach [Spec;DP]. After partial piedpiping has raised the noun above the projection where demonstrative and locative are generated, the demonstrative moves alone to fill [Spec;DP] stranding the NGT noun and leaving the NGT locative in postnominal position in (43). Yet, if the demonstrative is not raised, NGT differs from Spanish and behaves like LIS. In this case, Spanish fills the head D° with a definite article in (77.b), while NGT, which lacks articles, is forced to behave similarly to LIS, as in (45.b), and to pied-pipe some maximal projection to [Spec;DP]. In other words, NGT usually has a partial pied-piping in comparison to LIS, but is forced to extend it if the demonstrative does not raise alone. The NGT sentence (43) is thus derived with (78), while NGT (45.b) is derived with (79) along the lines of LIS derivation (75). From the merge order (78.a), the noun raises across the projection hosting demonstrative and locative in (78.b). Then the demonstrative moves to [Spec;DP] and in turn crosses over the noun, stranding the locative in postnominal position in (78.c)

78.

  a. $[_{DP}\ldots D°\ [_{AgrZP}\ldots Agr°\ [_{ZP}\ [\textbf{D}em\ Loc]\ Z°\ [_{NP}\ N]]]]$ (DemLoc-N)

  b. $[_{DP}\ldots D°\ [_{AgrZP}\ [_{NP}\ \underline{N}]\ Agr°[_{ZP}\ [\textbf{D}em\ Loc]\ Z°\ t_{AgrNP}]]]$ (\underline{N}-DemLoc)

  c. $[_{DP}\ [\underline{\textbf{D}em}]\ D°[_{AgrZP}\ [_{NP}\ N]\ Agr°[_{ZP}\ [t_{DemP}Loc]\ Z°t_{AgrNP}]]]$ (\underline{Dem}-N-Loc)

In (79), in contrast, the demonstrative does not move alone. Rather, it is the noun that moves across the demonstrative in (79.b) and reaches then [Spec;DP], either alone as in (79.c2) or with the demonstrative as in (79.c1). In principle, both raisings yield the N-Dem order.

79.

    a. $[_{DP} \ldots D° [_{AgrZP} \ldots Agr° [_{ZP} [\textbf{D}em] \; Z° \; [_{NP} \textbf{N}]]]]$ (Dem-N)

    b. $[_{DP} \ldots D° [_{AgrZP} \underline{[_{NP} \textbf{N}]} \; Agr° [_{ZP} [\textbf{D}em] \; Z° \; t_{AgrNP}]]]$ (N̲-Dem)

    c.1. $[_{DP} [_{AgrZP} \underline{[_{NP} \textbf{N}]} \; Agr° [_{ZP} [\textbf{D}em] \; Z° \; t_{AgrNP}]] D° \; t_{AgrZP}]$ (N̲-Dem)

                                       or

    c.2. $[_{DP} \underline{[_{NP} \textbf{N}]} \; D° [_{AgrZP} \underline{t_{NP}} \; Agr° [_{ZP} [\textbf{D}em] \; Z° \; t_{AgrNP}]]]$ (N̲-Dem)

The difference between (78) and (79) is that the former involves the extraction of the demonstrative alone. The graphic representation of (78) is given in (80). Before the demonstrative raises, the projection under Dem may undergo pied-piping with inversion or not. As previously shown, in LIS, pied-piping applies always, whereas in NGT, I have no evidence for it in these data.

80. Derivation of NGT orders **Dem – … –N – Loc** and **N - Dem**

DP

DemP

D°
[+def]

AgrZP

ZP

***t*_{DEM+}(Loc/Ø)**
(Dem/Ø)+Loc

AgrYP

YP

NumP

AgrXP

XP

AP

NP
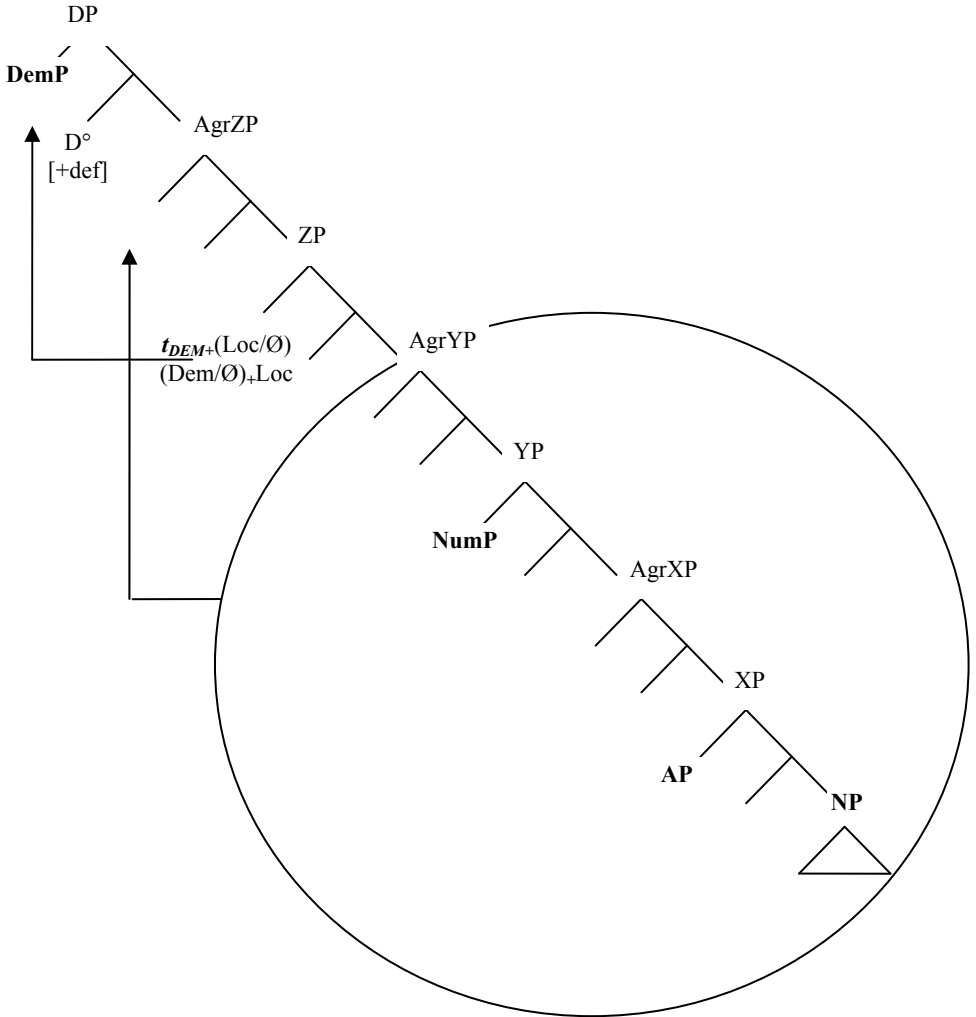
Considering this derivation, LIS and NGT differ minimally from each other in having a more or less extensive pied-piping, and both of them also differ minimally from spoken languages like Spanish, in having no article to spell-out D°. In other words, the difference between the three languages is the following. Spanish either fills [Spec;DP] with a demonstrative or fills the head D° with the article. LIS always fills [Spec;DP] with pied-piped material. NGT always fills [Spec;DP] either

with a demonstrative alone or (as a last resort) with pied-piped material. The fact that, in NGT, pied-piping to [Spec;DP] is possible, albeit not obligatory, accounts for sentences where there is neither a demonstrative nor article and yet the noun is definite, as in LIS. In such cases, the noun can be assumed to raise to [Spec;DP] either with "rolling-up" pied-piping of the "whose picture" type [$_{DP}$ [[[N]-A t]-Num t] D°] or with noninverting pied-piping of the "picture of who" type [$_{DP}$ [Num-[A-[N]]] D°].

Finally, I would like to briefly come back to the fact that NGT has prenominal and postnominal adjectives. In LIS, some postnominal adjectives are predicative adjectives derived from reduced relative clauses (Bertone 2007). Since NGT has relative clauses like (51) in postnominal position (see chapter 5), it is possible in principle that postnominal NGT adjectives are also derived from reduced relative clauses. In contrast, prenominal adjectives would be attributive. In fact, according to Cinque (2005b), predicative adjectives and attributive adjectives are merged in distinct positions and this explains their partially different properties. This matches the observation that some NGT adjectives which cannot be used predicatively *(*the week is next/previous*, *the example is other*), hence cannot appear in relative clauses, occur prenominally. In LIS, where the pied-piping is extensive and all adjectives are postnominal, this distinction is somewhat blurred – even though a specific NMM marks the position[27] of predicative adjectives derived from reduced relative clauses (Bertone 2007). In contrast, in NGT the postnominal or prenominal position of some adjectives might be related to their being or not being predicative. A discussion of attributive versus predicative adjectives in NGT lies outside the scope of the present study; I leave this issue for future research. However, while this hypothesis could account for the alternation between NGT postnominal and prenominal adjectives, it cannot account for the presence of postnominal and prenominal numerals in this language.

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[27] Bertone (2007) shows that predicative adjectives are signalled by a NMM used also for relative clauses. She also shows that these adjectives have a different distribution in comparison to attributive adjectives (which do not bear the NMM), even though adjectives are all postnominal in LIS.

2.2.3 Deriving the position of possessives and (location-assigning) NIXes

The different extension of pied-piping also accounts for another crosslinguistic variation observed between LIS and NGT: the different position of possessives. As stated in §2.1.2 and §2.1.5, these two languages have different kinds of possessives at their disposal: some can be regarded as strong forms, whereas others seem to behave like clitics or possessive suffixes. Here I will leave the question of different sorts of possessives open for future research and focus on their linear ordering. LIS has the order **N-Poss-A(-Num)-Dem**, whereas NGT examples show the **Poss(-Num)-A-N** order. LIS possessives follow the noun while NGT possessives precede it. This suggests that the LIS postnominal position is due to the "rolling-up" pied-pipings which apply more consistently than in NGT. Indeed, a similar crosslinguistic variation in the linear ordering of possessives is found also in spoken languages. The order of NGT reminds of the English word order, while, crucially, the order of LIS is the same order observed in the construct state of semitic languages discussed in Cinque (2000). Cinque proposes a unified account of possessive constructions involving genitive DPs, possessive pronouns, and construct states observed in different languages. Here, I will try to extend his analysis to LIS and NGT.

According to Cinque, possessives and construct states establish a relation with their noun in lower projections of the DP, below those that host adjectives. The possessive (pronoun or DP) is generated as external argument of the noun and raised to a genitive projection where it checks its genitive case. At this point, different derivations may arise. For instance, the noun raises and drags along GenP with noninverting pied-pipings until it reaches [Spec;DP], thus appearing in **Poss-N** sequence preceding all other DP-related elements (but following quantifiers which are external to DP). Another possibility is that the noun may raise alone stranding the possessive in a lower position resulting in a sequence **N-…-Poss**. Alternatively, after the possessive checks genitive case in [Spec;GenP], the remnant NP is moved higher by pied-piping with inversion, yielding a postnominal possessive. Then the inverted noun and possessive raise together so that the sequence **N-Poss** appears in front of all other elements. As seen before, raisings may occur in the form of pied-pipings which raise adjectives, numerals, and/or demonstrative

either with or without inversion. In the LIS sign order **N-Poss-A(-Num)-Dem**, the sequence noun-possessor precedes adjectives (and hence numerals) and demonstratives as if the possessive and noun were raised together in front of the other elements. As mentioned above, this is the same order observed in the construct state of semitic languages, where the genitive possessor separates the noun from its adjective.

Compare LIS (81) with sentence (82), discussed in Cinque (2000) as an example of N-Poss-A construct state.

81. *(What are you looking for?)*
    BOOK PIX$_1$-STRONG RED   [LIS: rep. from (60)]
    'my red book'

82.   [Arabic: discussed in Cinque 2000]
    (daxal-tu)   daar-a   r-rajul-i   l-wasi'at-a
    entered   house-ACC   man-GEN   large-ACC
    '(I entered) the man's large house'

In light of this, Cinque's genitive projection (between noun and adjective) can be added to figure (75), so that the LIS order of signs **N-Poss-A(-Num)-Dem** of (66) is accounted for as in (83).

83. Derivation of LIS sign order **N-Poss-A(-Num)-Dem/Loc**
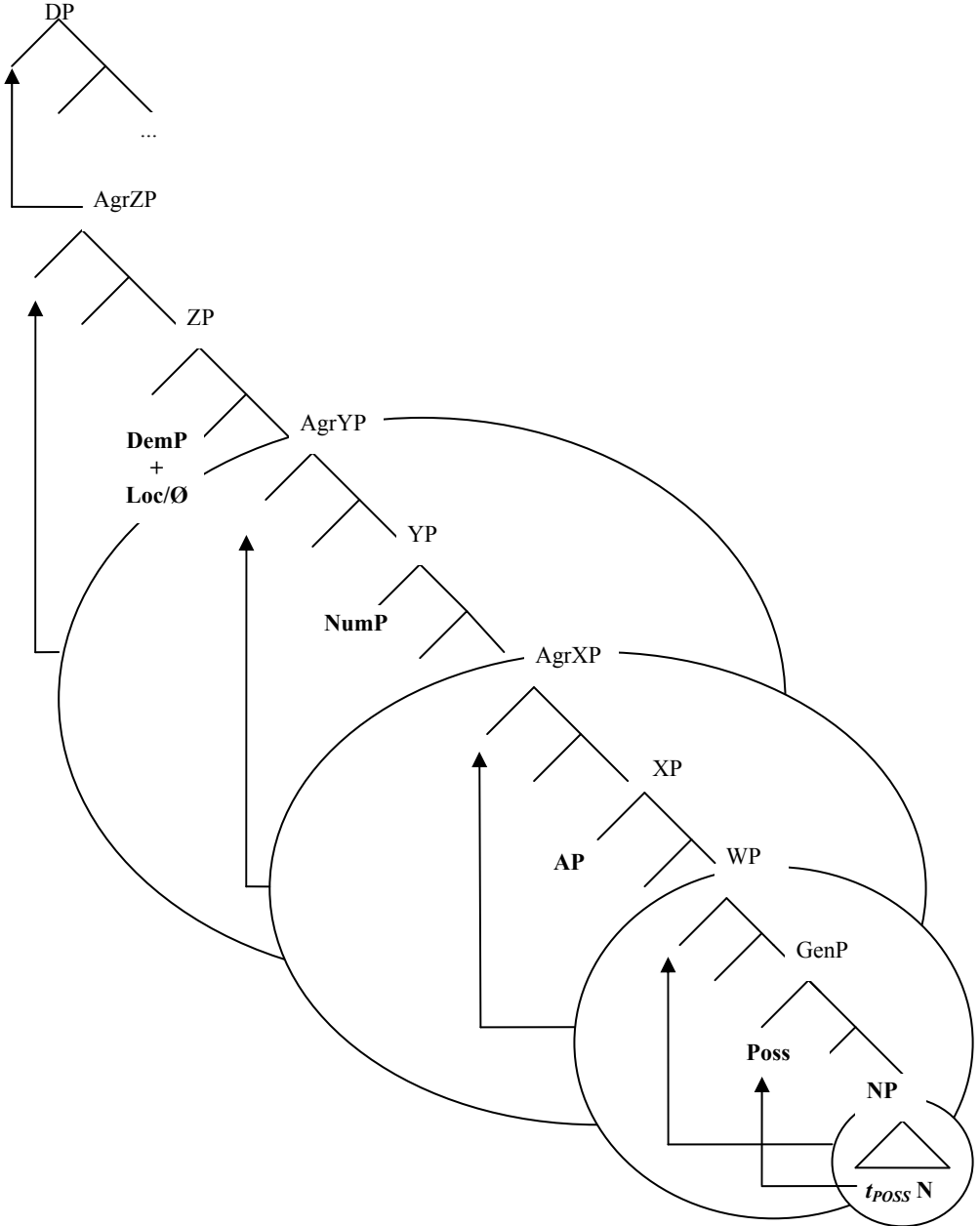
In contrast, in NGT the possessive seems to precede numerals and adjectives also leaving the noun in a lower position. This suggests that the NGT possessive reaches [Spec;DP] alone and blocks the movement of other constituents. Again, this fact is observed in spoken languages such as English or French. The possessive moving to [Spec;DP] accounts for the fact that in NGT, it can precede numerals, adjectives and nouns, with **Poss(-Num)-A-N** order, but follows quantifiers, which, as seen, are located above DP. It can be hypothesized that once the possessive is in [Spec;GenP], it proceeds alone from [Spec;AgrP] to [Spec;AgrP] until it reaches [Spec;DP]. Alternatively, it could proceed alone to the agreement projection above NumP and this AgrP, in turn, moves to [Spec;DP] raising possessive, numeral, adjective and noun without rolling-up. The fact that in NGT both the possessive and the demonstrative "compete" to reach [Spec;DP] may account for the fact that apparently, it is difficult to observe sentences where possessive and demonstrative co-occur prenominally in this language. This hypothesis predicts that, in case one of the two were prenominal, the other should be stranded in a lower position, presumably in its original merge position. However, I have not been able to verify this hypothesis.

Finally, it is relevant to consider the status of NIXes. As discussed in §2.1.1, these indexes are special as they assign a location to the referent, instead of resuming it. They are not locatives, since locatives recall the place of a referent. For instance, sentence (27.a), repeated here as (84), is not about "*my brother here" (as if I had "the brother here" contrasting with "a brother there"), but it is simply about "my brother".

84.   [NGT: GIDS 3.0, localisatie – inleiding 3/13]

               top.

PIX_1 BROTHER NIX_{RGT} THIS^EVENING IX_{RGT} $_{RGT}VISIT_1$

'My brother, tonight he is visiting me'

This fact excludes NIX from being a true locative. It does assign a location for pure grammatical purposes, but it does not point to the spatial location where the referent is located. This means that a NIX is unlikely to sit in the functional projection where demonstratives and locatives are merged. Rather, I would like to follow Bertone's observation that the spatial features are often associated with referentiality, agreement, and possibly case and are in D°. From this viewpoint, it can be tentatively

proposed that these indexes are the realization of the spatial features in D°[28]. The fact that they appear postnominally in LIS is not a problem for the present analysis, because pied-piping in LIS is active even above DP (for some independent reason). The NIX, which occupies D°, is thus stranded in DP-final position. In NGT, where piedpiping is optional and does never go higher than [Spec;DP], these postnominal indexes could still be accounted for under the hypothesis that they are in D° and attract material to [Spec;DP]. In the case of (84), this position is filled by a projection containing both the possessive and the noun. Therefore, we can conclude that NGT has both D° and [Spec;DP] filled. This double filling may turn out to be a more general property of NGT as suggested, for instance, by the analysis of interrogative clauses in chapter 4, where some clause-final interrogative particles are treated as heads which attract the proposition in their specifiers (following Aboh & Pfau 2011).

2.3 Conclusions

LIS and NGT show considerable crosslinguistic variation in the ordering of elements inside the DP. They also show different orderings of quantifiers, which are above DP. In addition to this, NGT seems to allow for a wider **intra**linguistic variation regarding the position of numerals and adjectives and, to a lesser extent, demonstratives. Yet, these sign orders do not display a free variation, but follow specific patterns, although not all relevant elements are easily observed in a single signed sentence. However, the linear ordering of elements can be reconstructed on the basis of attested partial combinations of signs. The two languages provide insight into the structure of DP elements in two ways. On the one hand, in LIS it is more easy to observe the co-occurrence of demonstratives, numerals, adjectives, and possessives. On the other hands, NGT provides evidence for the co-occurence of demonstratives

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[28] Assuming that NIXes occupy D° does not necessarily imply that they are definite articles. Bertone (2007) argues convincingly that postnominal indexes do not behave as definite articles. Rather, they can be associated with referentiality and, crucially, (locus) agreement. Here, I follow Bertone's hypothesis, but it is possible that, assuming a more fine-grained DP structure, NIXes turn out to occupy another head position within DP. The relevant aspect is that this position is high in the DP structure.

and locatives and gives partial insight into the position of the adjective OTHER.

The complete sign order of LIS is **N – Poss – A – Num – Dem/Q/Loc**, although Num-A-Dem is also a possible order. In contrast, NGT allows for a much wider variation and shows a sign order **Q/OTHER/Poss/Dem – (N-A-Num)/(Num-A-N) – Loc**. Moreover, the NGT noun can occasionally appear before the demonstrative, but apparently must always follow the adjective OTHER, thus offering possible evidence that OTHER and demonstratives occupy different positions. NGT also shows that OTHER is lower than quantifiers since it allows the sequence MANY – OTHER. Comparing the two languages, it turns out that postnominal LIS elements appear in the mirror order of NGT prenominal elements. Also, those flexible elements that in NGT can appear postnominally show the mirror order of their prenominal counterparts (i.e. they appear as in LIS). This variation fits the range of variation attested across spoken languages discussed by Cinque (2000, 2005a). Moreover, the positions of the possessives parallel those found in spoken languages: the LIS possessive, close to the noun, behaves as the semitic construct state discussed by Cinque, whereas the NGT possessive, preceeding numerals, adjectives and nouns, behaves as its English or Spanish counterpart.

Based on these observations, an analysis of LIS and NGT sign order is built on Cinque's hierarchy of DP-related projections as well as on Giusti & Cardinaletti's (2003) analysis of quantifiers and Brugè's (2002) account for demonstrative-locative pairs. I develop Bertone's (2007) analysis of the DP of LIS, taking into account also the position of locatives and possessives in LIS and NGT. Taken together, the orders of signs of the two languages prove to be compatible with an antisymmetrical deep structure, where elements are merged in the order **Q-DP-Dem-Num-A-Poss/Gen-N,** as proposed by Cinque, and the high adjective OTHER is somewhere above Dem. I also assumed that demonstratives are generated together with an optional locative below D°, following Brugè (2002). The position of the demonstrative with respect to numerals and adjectives, however, is considered to be high, as also suggested by Cinque. Different superficial orders are derived by leftward movements of the NP which can trigger the raising of other maximal projections either by means of "rolling-up" pied-pipings or by means of noninverting pied-pipings. Rolling-up pied-pipings yield the (partial)

inversion of noun, possessive, adjective, numeral, demonstrative, and quantifiers, while other pied-pipings raise constituents without inversion. Following Cinque, I consider adjectives, numerals and demonstratives as maximal projections (AP, NumP, DemP) merged in the specifiers of functional projections and I assume a genitive projection between NP and the lowest AP. As in Cinque, agreement projections are "interspersed" between functional projections. Quantifiers are taken to occupy a Q° head above DP, following Giusti & Cardinaletti (2005). The first step of the derivation is the raising of the possessive (if any) and the possible pied-piping of the remnant NP. Successive movements then raise constituents to agreement projections interspersed between the functional projections, proceeding from AgrP to AgrP. The order of LIS elements, not only N-A-Num-Dem, but also concerning possessives and quantifiers, is the same as observed in semitic languages and is straighforwardly accounted for by a sequence of inverting pied-pipings which apply to the whole DP and can target a position above quantifiers. NGT appears to apply inverting pied-pipings to a lesser extent, just as Spanish or English. In NGT, they occur easily until above NumP, but they reach [Spec;DP] only when no demonstrative can reach it alone. In fact, in NGT, pied-piping seems to stop before the high adjective OTHER which appears prenominally. Demonstratives can occasionally invert with nouns, thus appearing postnominally. This offers evidence that OTHER occupies a position different from that of other adjectives and also different from the position of the demonstrative. The possible absence of pied-piping also leaves in prenominal position the NGT quantifier MANY, which appears in the merge order with respect to the prenominal high adjective OTHER, that is, the high adjective is below the quantifier.

The advantage of this approach, in comparison to nonantisymmetric theories, lies not in what it predicts, but rather in what is ruled out. For instance, this approach predicts that demonstratives and/or locatives may appear postnominally (with possible ambiguity as in LIS) and that the noun can be "sandwiched" between a prenominal demonstrative and a postnominal locative, but it excludes postnominal demonstratives with prenominal locatives (since locatives do not raise to [Spec;DP]). Indeed, this restriction is observed in LIS, where Dem and Loc are always postnominal, and in NGT, which allows Dem-N-Loc and N-Dem sequences, but not the *Loc-N-Dem sign order. A sequence Loc-N may appear in LIS (and, I guess, also in NGT), but it has a presentative

meaning (as "There/Here is a house" or "Here are some children"). In this case, locative and noun do not both belong to the DP, but a null copula is understood. The antisymmetric account proposed here also rules out A-Num-N and A-Num-Dem-N orders, for instance, though allowing for Num-A-N and N-A-Num(-Dem) orders. Again, N-A-Num-Dem is observed in LIS and both Num-A-N and N-A-Num are observed in NGT, while I have encountered neither an A-Num-N nor an A-Num-Dem-N order in either language. This approach also brings together spoken and sign language data, reducing the differences between LIS, NGT and Spanish to the presence vs. absence of a definite article in D° and to the different extent to which pied-piping applies. Moreover, the observation that noninverting pied-pipings are more marked than pied-pipings with inversion is verified in these two sign languages. LIS only makes use of rolling-up pied-pipings and in NGT pied-piping with inversion occurs as well, albeit to a minor extent. In contrast, in both languages, the use of the more marked noninverting pied-piping is limited: it is virtually nonexistent in LIS, while in NGT, it is restricted to those cases in which Num-A-N must be moved to [Spec;DP] because no demonstrative is available to fill it.

It is also important to note that the fact that crosslinguistic and intralinguistic variation are not free is difficult to explain under the hypothesis that no fixed merge order exists. Especially, the fact that one order of signs (A-Num-N) and its mirror order (N-A-Num) appear in one and the same language (NGT) contrasts with the idea that linear ordering at surface structure is a direct reflection of deep structure. In other words, it suggests that distinct orders of signs do not necessarily imply distinct merge orders. If this were the case, it would amount to saying that one and the same language, NGT, has two different deep structures at the same time. Rather, distinct linear orders are derived via movement from one merge order. The same holds for the alternation N-A-Num vs. N-Num-A attested in LIS.

The weak spot of this analysis is that it does not take into account classifiers, which are used very frequently in sign languages. It also fails to provide an analysis for the relative linear ordering of different adjectives (Scott 2002), given the difficulty of lining up different adjectives in one and the same NGT sentence. This is (partially) related to the difficulty of distinguishing between attributive adjectives and predicative adjectives derived from reduced relative clauses in NGT.

Cinque (2005b) proposes that attributive adjectives are merged in a structural position different from the one of predicative adjectives derived from reduced relative clauses. LIS adjectives are all postnominal and display a clear hierarchy, with attributive adjectives preceding adjectives derived from reduced relative clause (Bertone 2007). In contrast, the fact that NGT adjectives appear both pre- and postnominally makes it difficult to detect a hierarchy. However, the fact that some nonpredicative adjectives must appear in prenominal position in NGT suggests that this sign language is an interesting language to investigate in order to determine whether predicative and attributive adjectives occupy distinct positions in the structure.

Apart from this, the agreement position hypothesized by Cinque, necessary for the pied-pipings, must be motivated. In LIS and NGT, there are undoubtedly some instances of agreement among DP-related elements. Thus, they are possible candidates for motivating the hypothesis of pied-piping. However, I have not been able to determine how (and whether) they interact with pied-piping in these languages. For instance, as seen in §2.1.3 and §2.1.4, there is number agreement between noun and demonstrative and between noun and numeral in LIS and NGT. However, although plural number agreement occurs in both LIS and NGT, they have quite different orders (postnominal numerals vs. prenominal ones). At the same time, numerals and quantifiers precede the noun in NGT as they do in DGS, even though NGT nouns are overtly marked for plural in the presence of numerals while DGS nouns are not. Thus, there does not seem to be a clear relation between number agreement and linear order. Besides, a comparative study of other possible agreement phenomena (e.g. agreement in location) in LIS and NGT must still be taken into account. Location (also called locus) plays some role in Bertone's (2007) analysis of LIS and in my extension to NGT, when we assume that locus features are in D° and require some material to raise to [Spec;DP]. Location is also relevant for agreement in NGT according to Zwitserlood (2006). However, the relation between location agreement and linear order within DP elements has not been investigated here. Bertone proposes also that classifiers in LIS are involved in agreement phenomena and noun raising within the DP. Given that I have not addressed classifiers in this dissertation, their possible relation to the crosslinguistic and intralinguistic variation in LIS and NGT sign orders still remains to be explored. In conclusion, an

antisymmetric approach to the DP of LIS and NGT is an interesting hypothesis to pursue, but, in my opinion, further research is necessary to strengthen it by motivating each single instance of raising during the derivation.

Chapter 3: The structure of the simple sentence: aspect, modals and negation

As discussed in §1.1.1, sign languages have a specific order of elements, in the sense that signs cannot be combined randomly to form sentences. With respect to the unmarked word order of subject, verb and object in plain declarative sentences, there is a certain crosslinguistic variation among both sign languages and spoken languages. For instance, LIS and NGT are both considered SOV languages (a.o. Laudanna (1987), Cecchetto et al. (2004), and Bertone (2007) for LIS; Coerts (1994) and Bos (1995) for NGT) because the direct object and the indirect object usually precede the verb in the surface order. Other sign languages have been argued to have an SVO surface order. For example, ASL is SVO, although different orders are possible (Fischer 1975; Liddell 1980), and so is Swedish Sign Language (Bergman & Wallin 1985). Interestingly, the spoken languages in the direct environment of a sign language often show a different surface order than the sign language: Italian, for instance, is SVO and Dutch stays somehow in the middle having an SOV order in subordinate clauses, an SVO order in main clauses, and the object sandwiched between auxiliary and past participle when compound verbal forms are used. Thus, LIS and NGT show a different linear order compared to the surrounding spoken languages Italian and Dutch. However, the differences concern not only the unmarked order of subject verb and object, but also the ordering of modals, negations, and aspectual markers with respect to the verb. It is therefore possible that LIS and NGT, although they are both SOV languages, display some differences in the linear order of other elements of the sentence.

This chapter presents and discusses some data regarding the position and the behaviour of negation, modals, and aspectual markers with respect to the verb in declarative clauses. In other words, it addresses what is generally called the IP domain (other sentence types, including interrogative, imperative, conditional, and relative clauses are analyzed in chapters 4 and 5). The discussion will focus on the costs and the advantages of a derivation based on an antisymmetric, that is, Specifier-Head-Complement, deep structure along the same lines proposed for the DP in chapter 2. The analysis, however, will be somewhat more tentative than the analyses proposed in other chapters since sign languages often make use of nonconcatenative morphology (see chapter 1) to encode

morphosyntactic features corresponding to adverbs, aspectual markers, or even negation. It is therefore not always possible to unambiguously establish the linear ordering of the elements to be discussed, making a satisfactory analysis difficult[29]. Moreover, in my opinion, a complete understanding of the IP domain of LIS and NGT can be achieved only once their verbal agreement system has been fully described and analyzed. Since both languages sometimes show much richer agreement than well-known spoken languages, their structure is more difficult to unravel. An analysis of verbal agreement is, however, outside the scope of this dissertation. Data on agreement will serve here to discuss some general properties of LIS and NGT which are the starting point for the analysis. Thus, while this chapter will not provide a theoretical account for verbal agreement of LIS and NGT, a brief **description** of it will be presented, which will turn out to be necessary for the discussion of some basic premises relevant for the analysis.

This chapter is organized as follows. In §3.1, I present some data on the ordering of different elements in the simple sentence. In §3.2, I will analyze the ordering of verb, modals, aspect markers, and negation, arguing in favour of a Specifier-Head-Complement phrase structure. Some special properties of synthetic negative modal signs will also be discussed. General conclusions follow in §3.3.

3.1 The word order within the simple sentence

I will start the discussion of word order within the simple sentence by outlining the basic SOV sign order of LIS and NGT in §3.1.1. This will turn out to be useful for the discussion of more complex constructions (interrogative clauses, conditional clauses, topicalizations, relative clauses) in chapters 4 and 5. In the same subsection, I also sketch some properties of the verbal agreement system of the two sign languages; the presence and position of agreement are important factors that must be taken into consideration when analyzing the distribution of modals, aspectual markers, and negation (in the second part of the chapter). In §3.1.2, some information will be given about the ordering of selected aspectual and tense markers in these two languages. §3.1.3 will describe

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[29] See Vermeerbergen et al. (2007) for problems related to simultaneity in sign languages.

the realization and the position of negation, whereas §3.1.4 will deal with modals and negative modals.

3.1.1 Word order in plain declarative sentences

This section describes the unmarked order of LIS and NGT and the position of some adverbs in simple declarative sentences. It also focuses on the different verbal agreement strategies of these languages and the different positions in which verbal agreement appears in the sentence, depending on the employed agreement strategy. This information will serve as a useful background both for the other sections within this chapter and also for the next chapters.

Consider the following simple declarative sentences: (85.a) and (85.b) contain an agent and a transitive verb, and (86.a) and (86.b) illustrate different possessive constructions. The order in LIS (85.a) and NGT (85.b) is SOV. In these examples, I have observed no overt agreement – be it manual or nonmanual – between the verb and its arguments. In both languages, the verb DRINK always contains a movement toward the signer's mouth, regardless of who is the subject. These example have a 1st person sg. subject (IX_1). However, using a 2nd or 3rd person subject, the sign DRINK would not change to show agreement (unlike English *I drink – he drinks*, Dutch *ik drink – hij drinkt*, or Italian *Io bevo – egli/lui beve*). The verbal movement does not encode agreement with the object either.

85.
    a.   IX**₁** WATER DRINK   [LIS]
          'I drink water'
    b.   IX**₁** WATER DRINK   [NGT]
          'I drink water'

The order in (86.b) is SOV, too. In (86.a) an existential verb is used[30]. Its subject is the possessee DOG, which follows the 2nd person singular possessor IX_2. The verb does not agree overtly with the subject, nor with the object. In (86.a) and (86.b), both languages display the order Possessor-Possessee-Verb.

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[30] This sign is often glossed as "C'È" in Italian because, in addition to its possessive use, it is also employed to express existence or presence conveying the meaning of "X exists / There is X / There are some Xs".

86.

   a.   IX$_2$ DOG THERE-IS   [LIS]

       'You have a dog' (lit. 'to you a dog there is')

   b.   IX$_2$ DOG HAVE[31]   [NGT]

       'You have a dog'

Here, I want to point out that the SVO order is not unattested in LIS, but seems related to other factors, such as the absence of agreement on the verb or the reversibility of a sentence (Laudanna 1987; Bertone 2007). However, Bertone (2007) describes different kinds of agreement markers (cliticized/weak indexes and nonmanual markers such as eyegaze) which favour an SOV order, in addition to the synthetic verbal inflection (change of the start/ending point of the verbal movement). In particular, LIS indexes and nonmanual agreement markers seem to be able to license an SOV order also with verbs which contact the body, plain verbs, which lack synthetical inflection and would otherwise require an SVO order. According to Bertone, SOV order is thus possible even with plain verbs in reversible sentences, if agreement through eyegaze or indexes is present, and in this case, the arguments precede the verb. In addition to this, examples (85.a) and (85.b) show that SOV order is accepted in LIS and NGT even if no overt agreement appears on the verb. Also in NGT, it is possible to have an SVO order (Coerts 1994) in addition to the SOV one. However, it is not clear what triggers the different orders. Alternative orders might be the consequence of verb movement or object shift (see Matsuoka (1997) and Braze (2003) for ASL). However, the derivation of SOV/SVO orders is not addressed in this dissertation (only some brief speculations will be offered in §6.4 for LIS).

    As was discussed in §1.1.3, some sign language verbs show rich synthetic person inflection by making use of the signing space. By means of this mechanism, the verb overtly agrees with subject and objects (but recall the exception of Kata Kolok mentioned in chapter 1). LIS and NGT conform to this pattern, as shown in examples (87) and (88) where the verb agrees overtly with its arguments, that is, with both the subject and the object. In an unmarked context, these usually appear before the

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[31] This sign is accompanied by the mouthing *heb* ('have'), hence the gloss. It indicates possession but not existence.

verb yielding an SOV order as in (87). In (88), too, the verb is preceded by its arguments. The pronouns are optional, depending on the context.

87. (IX$_2$) (IX$_1$) $_2$CALL$_1$ [LIS/NGT]
    'You call(ed) me'

88. CHILD$_{LFT}$ (IX$_{RGT}$) BOOK $_{LFT}$CL:^GIVE$_{RGT}$ [LIS/NGT]
    'A/The child gives a book to him/her'

While the verb in (87) is accompanied by two arguments, in (88) the agreeing verb has three arguments: the 3rd person subject/agent CHILD$_{LFT}$ (i.e. signed on the left side of the signer), the indirect object/beneficiary 3rd person pronoun IX$_{RGT}$ (signed on the right side), and the 3rd person direct object/patient BOOK. All three arguments precede the verb GIVE in both LIS and NGT. The SOV order of these languages is thus better described as S-iO-dO-V. According to Pfau & Bos (2008), NGT also allows for the order S-dO-iO-V. I do not know whether this variation is attested in LIS, too. In either case, the objects precede the verb and follow the subject in both LIS and NGT. This observation is sufficient for the purpose of this dissertation. In (88), the verb agrees in location with subject and indirect object. In this case, a classifier (CL) occurs. The classifier is obligatorily incorporated[32] into the verb, that is, the classifier handshape which refers to some physical properties of the direct object (the book) combines with the verb (thus moving from left to right). Here I will not go into detail about the nature of classifiers (the reader is referred to Corazza (1990) and Emmorey (2003), amongst others). I restrict myself to noting that, by means of the classifier, the verb acquires some properties that refer to the object. Zwitserlood & Van Gijn (2006) explicitly argue that the occurrence of classifiers in NGT verbs is an instance of agreement (or class agreement). In an independent research, Bertone (2007) argues that classifiers on LIS verbs are also an instance of

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[32] Here, I do not use the word "incorporation" in the sense of Baker (1988). The word "incorporation" is employed here to parallel its use in "numeral incorporation", where the handshape representing the numeral is incorporated into the base sign of the "numbered" noun, becomes a part of it, and takes on the movement of the base sign (if the base form of the sign has a movement). That is, I simply imply that the shape of the classifier takes on the movement of the base verb so that the classifier becomes a part of the verb (it becomes its handshape).

gender/class agreement. In LIS, the handshape of the noun appears to be occasionally incorporated into the verbal movement, as in the case of the two-handed sign BOOK in (89). Such a strategy seems not to be allowed in NGT. However, as far as I could observe, such incorporating forms are not compulsory and using just a base verb GIVE is grammatical, as in the NGT example (90).

89. (IX$_1$) (IX$_2$) (BOOK) $_1$BOOK^GIVE$_2$ [LIS]
    'I give you a/the book'

90. [NGT: Pfau 2008b:200]
    IX$_1$ IX$_2$ GRAAG[33]   BOOK $_1$GEVEN$_2$
    ix1   ix2   with-pleasure   book   1S-give-2O
    'I would like to give you a book'

Throughout the dissertation, I will employ the label "synthetic inflection/agreement" to refer to agreement expressed by spatial modifications that change the start- and end-point of the verb. I will call "synthetically inflected verbs" all verbs that are spatially modified to show agreement by changing the start- and end-point of their movement.

Let us now consider the position of some time adverbs. Time adverbs, when employed, usually appear sentence initially in both languages, leaving the basic sign order unchanged, as can be seen in examples (93) and (94) as compared to (91) and (92):

91. IX$_2$ (IX$_1$) $_2$GO$_1$ [LIS/NGT]
    'You come to me'

92. CHILD$_{RGT}$ SCHOOL$_{LFT}$ (IX$_{LFT}$) $_{RGT}$GO$_{LFT}$ [LIS/NGT]
    'A/The child goes to (the/that) school'

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[33] Van Gijn & Baker (2003: 199) recorded two NGT signs for English 'want to': a sign glossed WILLEN which they render as 'really want' and a more neutral form glossed as GRAAG-WILLEN.
Also the NGT online dictionary (http://www.kegg.nl/egg_gebaren.php) reports two different signs for 'want to', glossed as WILLEN and GRAAG. Given that two different forms exist and that their meanings must be kept distinct, I translate Baker's gloss GRAAG literally as 'with-pleasure', even though it fulfils the function of English 'want-to'.

93. TOMORROW (IX$_2$) (IX$_1$) $_2$GO$_1$ [LIS/NGT]
    'Tomorrow you (will) come to me'

94. YESTERDAY CHILD$_{RGT}$ SCHOOL$_{LFT}$ (IX$_{LFT}$) $_{RGT}$GO$_{LFT}$ [LIS/NGT]
    'Yesterday a/the child went to (the/that) school'

The resulting order of elements is AdvSOV. However, notice that in (93) and (94), the verb itself does not change its form to express tense. In (93) the future tense is encoded only by the sentence-initial sign TOMORROW, but the phonological form of the verb is identical to that in (91). Likewise, in (94) the past tense is expressed only by the sentence-initial sign YESTERDAY, but the verb is not different from (92). In LIS there is no tense inflection, at least not in the sense in which tense is usually understood (see Zucchi (2009) for an alternative account which involves nonmanual tense marking: shoulders forwards=future, shoulders backwards=past).

    Also notice that without adverbs, sentences like (93) and (94) can be interpreted as present tense unless tense is specified otherwise in the context. Signs meaning 'now', however, can also appear sentence-initially, as indicated in NGT example (95): the same sign order is also grammatical in LIS[34].

95.   [NGT: adapted from Pfau & Bos 2008:125]
    NU   IX$_1$ STATION   IX$_{3b}$ $_1$GAAN$_{3b}$
    now ix1   station   ix3   1S-go-3O
    'I go now to the station'

So far the two sign languages behave alike. As was shown in chapter 1, however, some differences exist between them. In the context of plain verbs, which cannot be spatially modified to express agreement synthetically, the two languages may resort to two different analytic inflection strategies, namely the use of indexes or of an auxiliary agreement marker (see §1.1.4):

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[34] Pfau & Bos (2008) do not specify whether third person locations are "right" or "left", but label them generically as "3a" or "3b" in their examples.

96. IX$_1$ WAIT IX$_2$ [LIS]
    'I wait(ed) for you'

97.   [NGT: adapted from Pfau & Steinbach 2007:317]
    ALWAYS IX$_1$ WAIT++ $_1$OP$_2$
    'I always (have to) wait for you'

The LIS verb WAIT in (96) appears between two indexes which, however, do not function as pronouns but as agreement markers. In particular, they do not have the tense movement characteristic of strong pronominal indexes. Bertone (2007) therefore classifies this type of indexes as clitics or weak pronouns. The verb intervenes between these markers just as synthetically inflected verbs appear between agreement suffixes in (93) and (94). In contrast, the NGT verb WAIT in (97) precedes the auxiliary OP which encodes both subject and object agreement, so that in this case, subject agreement follows the verb. Double agreement as in (98) is also observed in NGT, albeit not frequently, thus suggesting the existence of two distinct positions for agreement in the sentence:

98.   [NGT: adapted from Pfau & Steinbach 2007: 317]
    IX$_3$ $_3$TEASE$_1$ $_3$OP$_1$
    'He teases me'

Another difference between the two sign languages concerns the position of adverbs of frequency, for instance, the signs for ALWAYS. In LIS the sign ALWAYS appears postverbally as in (99.a), while in NGT it can be preverbal as in (99.b). In this case, it follows the subject, but it precedes both verb and object.

99.
 a. IX₁ KEY LOSE ALWAYS   [LIS]
   'I always lose my keys'

 b.   [NGT: adapted from Pfau & Bos 2008:128]
   IX**₁** ALTIJD SLEUTEL KWIJT
   ix1 always key lose
   'I always lose my keys'

In conclusion, the basic order of both LIS and NGT is S-O-V with a possible extension to S-iO-dO-V, though both languages allow for dropping the subject or the object under certain circumstances. Both languages have synthetically inflected verbs which agree overtly with subjects and objects. The way in which the verb is inflected, however, may vary between the two languages, yielding under certain conditions some differences in the position of the agreement markers. This difference might be related to other properties of NGT, as mentioned in §3.2.2. Also, the adverbs of frequency occupy different positions in the two languages. What is relevant for the moment, however, is the fact that LIS and NGT verbs show rich person inflection (albeit not always overtly) which encodes object and subject agreement and that this inflection appears directly on the verb, at least in some verb classes.

3.1.2 Aspect

This section describes the form, distribution, and ordering of some aspectual markers with respect to the verb in LIS and NGT.

As pointed out in §3.1.1, verbs do not overtly inflect for tense in LIS and NGT, although they do inflect for person agreement. In additon to this, both LIS and NGT have a rich system of aspectual marking. This is achieved in different ways, for instance, by reduplicating the verb, changing the duration of its movement, or adding some special sign. Aspectual marking is a widespread phenomenon across sign languages (see, for instance, Fischer (1973), Klima & Bellugi (1979), and Liddell (2003) for ASL; Hoiting & Slobin (2001) for NGT; Zucchi (2003) for LIS). Thus, in LIS and NGT sentences (100), (101) and (102), perfect aspect is realized by adding a lexical marker after the verb. The marker employed in NGT is the two-handed sign READY (in Dutch "klaar") while

the marker employed in LIS is the one-handed sign DONE (in Italian "fatto"). These markers also retain a completive meaning 'to have finished[35] *x-ing*'. They follow both agreeing and plain verbs, that is, their position does not depend on the presence of overt person agreement. Thus, LIS and NGT display the ordering of elements **Verb-Perf**ect (see (100), (101) and (102)):

100.
  a.   IX$_1$ EAT DONE   [LIS]

  b.   IX$_1$ EAT READY   [NGT]
    'I (will) have eaten'

101.
  a. $_1$ASK$_2$ DONE   [LIS]

  b. $_1$ASK$_2$ READY   [NGT]
    'I (will) have asked you'

102.
  a. $_{LFT}$PHONE$_1$ DONE   [LIS]

  b. $_{LFT}$PHONE$_1$ READY   [NGT]
    'S/he (will) have phoned me'

The markers of perfect aspect, though often used in past contexts, are compatible with future tense since the informants also judge them grammatical in contexts where anteriority is involved but not past tense. Both (103.a) and (103.b) can refer to the present or the future.

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[35] In LIS also a second form exists, glossed as FINISHED ("finito"), which is similar to the NGT perfect marker and slightly different from the LIS sign DONE (it is two-handed). It is not clear to me whether it is a variant of this latter sign or whether it also bears a different nuance of meaning.

103.

    a.   TOMORROW, $_1$PHONE$_2$ DONE, (IX$_1$) SCHOOL$_{RGT}$ $_1$GO$_{RGT}$ [LIS]
        'Tomorrow, (after) I have called you, I will go to school'
        'Tomorrow, I will call you and then I will go to school'

    b.   [NGT: adapted from Pfau 2008b:199]
        IX$_1$ BOEK LEZEN KLAAR, IX$_1$ BOEK $_1$GEVEN$_2$
        ix$_1$ book read ready, ix$_1$ book 1s-give-2o
        'When I have read the book, I will give the book to you'

In LIS the one-handed sign DONE is produced immediately after the verb, thus forming one prosodic unit. It is articulated at the (end) location of the verb. In fact, first the verb PHONE or ASK moves, and only after it has reached its endpoint, the hand articulates the sign DONE in that location. In (102.a) and (100.a), for instance, the perfective marker is performed near the signer's body while in (101.a) and (103.a), it is performed further away from it, towards the 2nd person location. It thus seems that DONE can be cliticized onto the verb, but further research is required on this issue. In contrast, the two-handed NGT marker READY, according to my observations, is always signed in the neutral space; that is, it does not cliticize to the verb, although it follows the verb.

    Durative aspect can be marked on verbs by extending the duration of the verb. This can be achieved in different ways, depending on the phonology of the verb. In some cases, the duration of the verb is prolonged in one position by holding the verb in its final location. In other cases, it is the movement of the verb that is extended, yielding different types of continuous movement. Thus in (104), the verb PHONE clearly shows the durative affix realized by holding the verb in its final (1st person object) position, in (105) WORK shows a simple continuous movement, and in (106) EAT is articulated with a (continuous) two-handed alternating movement, which possibly leads to a sort of circular movement. In any case, the duration of the action is directly encoded by the duration of the continuous movement or the hold.

104. IX$_{RGT}$ $_{RGT}$PHONE$_1$^{hold} [LIS/NGT]
     'S/he has been phoning me for a long time'

105. IX$_1$ WORK$^{\textbf{cont}}$ [LIS/NGT]
      'I worke(d) for a long time (continuously)'

106. IX$_1$ EAT$^{\textbf{twohandalt}}$ [LIS/NGT]
      'I eat/ate for a long time (continuously)'

The speed at which an action is carried out can be conveyed through a specific marker, the counterpart of the celerative aspect morpheme attested in some spoken languages. Cinque (1999) reports Fula/Fulfulde as having a verbal suffix for celerative aspect (quoting Arnott (1970) and Fagerli (1994)). On the basis of the distribution of adverbs in English and Italian, he then argues (p.103) for a high celerative marker, corresponding to 'quickly', and a low celerative marker, corresponding to 'fast', which I am discussing here. In LIS and NGT, this marker, quite intuitively, is realized as a fast or slow (feature on the) movement of the verb; see (107) and (108).

107. IX$_1$ WORK$^{\textbf{fast}}$ /   WORK$^{\textbf{slow}}$ [LIS/NGT]
      'I worke(d) fast/slowly'

108. IX$_{\textbf{RGT}}$ SIGN$^{\textbf{fast}}$/   SIGN$^{\textbf{slow}}$ [LIS/NGT]
      'S/he signs at fast/slowly'

Celerative and durative morphemes affect different features of the verbal movement (e.g. speed, duration) and are thus potentially combined within a single verb, instead of appearing in linear order. It is therefore not easy to determine whether a morpheme precedes or follows another. For instance, the movement of one verb can be prolonged and quick at the same time as in (109), and it is thus impossible to say whether durative marking precedes celerative or vice versa. According to the informants' judgement, the form of (109) is acceptable in both LIS and NGT.

109. IX$_1$ WORK$^{\textbf{fast+cont}}$ [LIS/NGT]
      'I work(ed) fast for a long time'

Some of the markers, however, do appear in a specific order. In (110) and (111), for instance, the perfect markers, which are lexical, clearly follow

the verbs on which the [+duration] "hold" durative marker or the [+fast] celerative marker appears.

110. IX$_{\textbf{RGT RGT}}$PHONE$_\textbf{1}$$^\textbf{hold}$DONE / READY   [LIS/NGT]
     'S/he made me a long phone call to me'

111. IX$_1$ WORK$^\textbf{fast}$ DONE / READY   [LIS/NGT]
     'I (will) have been working fast'

The perfect markers follow the verb, that is, they are articulated once the signer has finished holding the sign in (110) and after the fast movement of the verb is terminated in (111). The opposite order is not attested. If the durative and the celerative markers were added after the perfect marker, then the perfect marker should be affected by them. For instance, one would obtain the signs DONE/READY combined with a hold (112.a), (112.b), contrary to fact[36]:

112.

    a.   *IX$_{\textbf{RGT RGT}}$PHONE$_\textbf{1}$ DONE$^\textbf{hold}$/ READY$^\textbf{hold}$ [LIS/NGT]

    b.   *IX$_{\textbf{RGT RGT}}$PHONE$_\textbf{1}$$^\textbf{hold}$ DONE$^\textbf{hold}$/ READY$^\textbf{hold}$ [LIS/NGT]
     'S/he has been phoning me for a long time'

---

[36] For similar reasons (anticipating the discussion in the next section), aspectual markers cannot be added to modals. If, for instance, the durative marker were added after modals, held modals would obtain, contrary to fact.

1.   IX$_{\textbf{RGT RGT}}$PHONE$_\textbf{1}$ *MUST$^\textbf{hold}$ [LIS/NGT]

As Anne Baker points out, ungrammaticality may derive from the fact that the semantics of modals cannot be modified by aspectual markers. This is not incompatible with a rigid ordering of projections within IP, since I am assuming that the hierarchy of syntactic projections reflects scope and semantic relations. In other words, the restrictions on the syntactic hierarchy and the semantic restrictions do not compete, but match. Otherwise, assuming these projections without any semantic reflex, would be an ad-hoc proliferation of structural positions just to solve a theory-internal problem of successive raisings. See the second part of this chapter for the proposed structures.

It is relevant to note that the sentences above are ungrammatical, regardless of whether only the perfect marker is inflected, as in (112.a), or both the perfect marker and the verb, as in (112.b). The ungrammaticality lies in the fact that the perfect marker is inflected. This means that sentences are grammatical only if the celerative or durative marker first combines with the verb (as an affix which modifies the verbal movement). Then the perfect marker (which is lexical) is added. In conclusion, although LIS and NGT verbs do not overtly inflect for tense, they show rich agreement with both object and subject and they inflect for various aspectual features. The order of aspectual markers in both languages is **V-Dur**ative-**Perf** and **V-Cel**erative(*fast*)-**Perf**.

3.1.3 Modals

This section describes the ordering of LIS and NGT modals with respect to both the verb and some aspectual markers presented in §3.1.2.

Modals in LIS are postverbal (Cecchetto et al. 2004; Bertone, in preparation). As for NGT, there is still uncertainty about their position. A small-scale study by van den Bedem (2006) suggests that they can occur postverbally, preverbally or doubled, that is, preverbally and postverbally at the same time. Because the two languages appear to be quite different with respect to the position of modals, I will present the data of each language here separately.

LIS has different modal signs for CAN, (BE-)ABLE, MUST, (HAVE)OBLIGATION/HAVE-TO, and WANT. Some of the modal meanings overlap, as is also commonly observed in spoken languages, but they are not completely synonymous. Modals are postverbal and are usually invariable, that is, not inflected for agreement or aspect. For instance, agreement, if overt, is marked on the lexical verb. See the following declarative sentences containing modals and both overtly inflected (113)-(116) and noninflected (117) verbs.

113. (IX$_1$) $_1$ASK$_3$ CAN   [LIS]
        'I can (possibly) ask him/her'

114. (IX$_1$) $_1$ANSWER$_2$ ABLE   [LIS]
        'I can/am able to answer you'

115. (IX₂) ₂GO₃ MUST   [LIS]
     'You must go there (to him/her)'

116. (IX₂) ₂GO₃ OBLIGATION   [LIS]
     'You have to go there (to him/her)'

117. (IX₂) WORK MUST   [LIS]
     'You must work'

Modal signs can be inflected when the lexical verb must retain an infinitival/impersonal form. For instance, in (118.a) the LIS verb FINIRE ('finish') agrees only with its object NP LAVORO ('job') (which is accompanied by an optional index) and is nonmanually marked as the topic of the whole sentence (see chapters 4 and 5 for the discussion on topicalized constituents). The Italian gloss LAVORO means both 'work' and 'job'. However, since in other examples WORK is a verb, I translate LAVORO as 'job' in (118.a) and (123.b) in order to make clear that we have to do with a noun in this case. In (118.a), subject agreement occurs on the modal NON^PUÒ, which agrees with the third person subject, the index IX₃ᵦ .The same modal, however, does not agree in (118.b) which has an unmarked order of signs. The modal employed is glossed NON PUÒ (lit. 'cannot') by Bertone, but corresponds to what I gloss ABLE^NEG in other examples in this dissertation[37]. In fact, according to Bertone herself, the modal is best translated as "not manage to" or "not to be able to". This is indicated in the interlinear literal translation (notice also, that Bertone does not mark third person locations on verbs and nouns as "right" or "left" here, but labels them generically as "3a" or "3b").

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[37] As will become clear in the second part of this chapter, in this dissertation, I use the gloss ^NEG to represent all special negative modal forms that do not follow the usual pattern of standard LIS/NGT negative constructions.

118.   [LIS: adapted from Bertone in prep.]

  a.

<u>   top   </u>

LAVORO$_{3a}$ (IX)   FINIRE$_{3a}$ IX$_1$ PUÒ   IX$_{3b}$ NON PUÒ$_{3b}$

job$_{3a}$ ix   finish   ix$_1$ able   ix$_{3b}$ able^neg$_{3b}$

'I am able to finish the job, he is not'

  b.   IX$_{3a}$ LAVORO$_{3a}$ (IX)   FINIRE$_{3a}$ NON PUÒ

      ix$_{3a}$ job$_{3a}$ ix   finish$_{3a}$ able^neg

      'He is not able to finish that job'

Modals also follow those verbs which inflect for aspect. For instance, the plain verb WORK found in (117) can receive the celerative modulation of (107) and still precede the invariable modal MUST in (124):

119. IX$_2$ WORK$^{\textbf{fast}}$ MUST   [LIS]

     'You must work fast(er)'

Also, with the appropriate context, the ordering **V-Perf-Mod** is grammatical. Take, for instance, a context where two people are involved, Marco (signed on the left) and Marta (signed on the right). Marco is in the mountains and Marta is supposed not to know it. Suddenly it turns out that she does know where Marco is. The speaker then asks «*How can Marta know about it?*» and a possible answer is (120), where one says that it is still possible that Marco himself has called Marta.

120. IX$_{\textbf{LFT LFT}}$PHONE$_{\textbf{RGT}}$ DONE CAN   [LIS: Bertone, p.c.]

     'He has possibly phoned her'

     'It is possible that he has phoned her'

As for NGT, it has five modal signs at its disposal: CAN, MUST, WANT, HAVE-TO, and MAY/(BE)ALLOWED. Van den Bedem (2006) only discusses CAN, MUST and WANT[38]. For HAVE-TO and MAY/(BE)ALLOWED (*hoeft* and *mag* or *mogen* in Dutch) see GIDS and the Effatha Group website (www.kegg.nl/egg_gebaren.php). I can only quote some examples where

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[38] Recall from note 36 that there are two slightly different NGT signs for 'want'. They are glossed GRAAG and WILLEN ('want' properly).

modals are able to appear in different positions within the sentence; see, for instance, (121)-(124) for the different positions of CAN. In (121) the modal precedes the verb, though following the subject. In (122) the modal is postverbal. In (123) the modal is postverbal, but precedes the postverbal subject index (recall from §3.1.1 that the subject can be doubled by a subject index in NGT). In (124) the modal is doubled: it appears once in preverbal position, after the subject, and once in postverbal position, following the time phrase and again preceding the postverbal subject index. Notice that van den Bedem labels third person locations simply as "3" in these examples.

121.   [NGT: adapted from v.d. Bedem 2006:27]
   IX$_3$ KUNNEN   HELE   DAG   LOPEN
   ix3   can   whole   day   walk
   'She can walk for a whole day'

122.   [NGT: Crasborn et al. 2004, in v.d. Bedem 2006:27]
   BETEKENIS GEBAREN   ZONDER-STEM $_1$AFLEZEN$_3$ KUNNEN
   meaning   sign   without-voice pick up   can
   'He can pick up the meaning of the signs even though I do not use my voice'

123.   [NGT: adapted from v.d. Bedem 2006:27]
   VERZOEK   TAS-AFHALEN, IX$_1$ ZITTEN   KUNNEN   IX$_1$
   request   bag-take   ix1   sit   can   ix1
   'Please, will you take your bag from the bench/sofa? Then I can sit'

124.   [NGT: v.d. Bedem 2006:28]
IX$_3$KUNNEN ANTWOORDEN ONTHOUDEN VOOR   EXAMEN   KUNNEN IX$_3$
ix3   can   answer   remember (be)for(e) exam   can   ix3
'He can remember the answer before/for the exam'

Examples (125) and (126) illustrate different positions of MUST. In (125) the modal sign occurs before the verb and after the subject. In (126) the modal is postverbal.

125.   [NGT: v.d. Bedem 2006:29]
   DAARNA IEDEREEN   MOETEN VERHAAL   VERTELLEN
   then   everybody must   story   tell
   'Then everybody must tell a story'

126.   [NGT: from v.d. Bedem 2006:29]
   IX$_1$ VERGADERING GAAN MOETEN
   ix1 meeting   go   must
   'I must go to a meeting'

In her survey, the author lists other possible word orders involving NGT modal signs. She remarks that double modal constructions may encode focus on the modal itself as in the *focus doubling* construction of ASL and Brazilian Sign Language (Nunes & de Quadros 2004; Petronio & Lillo-Martin 1997), but does not point out any other special properties possibly related to the different positions in which NGT modals appear. I was not able to detect possible influences on the ordering of modals either. However, the ungrammaticality of the following examples suggests that the ordering of aspectual markers and modals is subject to some restrictions. The same restrictions hold in both languages. The durative marker cannot follow the modal, or else the modal would be affected by the aspectual "hold" modification, contrary to fact, as in (127). Likewise, the celerative and durative markers cannot be added after the modal in (128). Also the perfect marker, which is lexical, cannot follow the modal in (129).

127. *IX$_{\textbf{RGT RGT}}$PHONE$_\textbf{1}$ MUST$^{\textbf{hold}}$ [LIS/NGT]

128. *IX$_\textbf{2}$ WORK MUST$^{\textbf{fast+cont}}$ [LIS/NGT]

129. *IX$_{\textbf{RGT RGT}}$PHONE$_{\textbf{LFT}}$ CAN DONE   [LIS/NGT]

Notice that in sign languages, one sign may often retain the same form even though it fulfils different functions. Moreover, both verbs and adjectives in LIS and NGT can either agree overtly or not. Thus, even morphology may not be sufficient to distinguish verbs and adjectives. Finally, remember that LIS and NGT also lack an overt copula. Out of

context, it is therefore difficult to determine whether a sign means, for instance, just 'nice' or '(be/am/is/are) nice'. This implies that it is almost impossible to determine whether the modal signs must be understood as real modal verbs (or markers), as adverbs, or as adjectives. For instance, in principle, the same LIS sequence: IX$_1$ $_1$GO$_3$ CAN might mean really 'I can (possibly) go' or '(that) I go (is) possible', or even something like 'me going there (is) possible'. As argued later in §3.1.5, however, these signs will be analyzed in the second part of this chapter, assuming that they are modals, not adjectives.

3.1.4 Negation and negative modals

This section compares the functioning and the distribution of the negation and negative lexical elements (as NOT-YET, NOBODY, NOTHING) in LIS and NGT. It will take into consideration negative NMMs, too. It also describes negative modal signs, that is, dedicated negative forms employed in the two languages to negate some modals. Also some data from other sign languages are presented briefly for comparison.

The expression of negation is a source of crosslinguistic variation between LIS and NGT, as it is generally among other sign languages. As already hinted at in §1.1.3, the expression of negation is one of the aspects of grammar where sign languages vary (see a.o. Zeshan (2006); Hendriks (2007, 2008)). With respect to this, LIS and NGT behave differently in that the former encodes negation through an obligatory clause-final lexical marker (Franchi 1987; Laudanna 1987), which I gloss as NOT[39], whereas in NGT, it is possible to negate a proposition using only the compulsory negative NMM "side-to-side-headshake" (Coerts 1992; Pfau & Bos 2008). In fact, in NGT, the manual negative sign NOT is employed very rarely. In other words: LIS is a manual dominant sign language and NGT is nonmanual dominant sign language (Zeshan 2006). Compare the LIS sentence involving lexical negation in (130.a) with the

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[39] Although Franchi (1987) and Laudanna (1987) gloss the manual negation as NO, this sign is different from the pro-sentence negation 'no' (also called negative interjection), which also exists in LIS. In fact, the latter has a quicker and more tensed movement. Indeed, LIS negation is usually glossed NOT/NON in other works (a.o. Cecchetto et al. 2004; Geraci 2005; Brunelli 2006; Branchini & Donati 2007). For the same reason I gloss it NOT here.

NGT sentence (130.b), which is negated using a nonmanual marker only[40].

130.

 a. (IX$_1$) $_1$ASK$_{LFT}$ NOT   [LIS]
    'I do/did not ask him/her'

                                                  neg

 b. IX$_1$ SATISFIED GOOD IX$_1$ [NGT: Coerts 1992:216]
    'I'm not satisfied at all'

In LIS a nonmanual marker may be also present (Geraci 2005). At present, it is not clear to me whether such a nonmanual marker is always required or whether it is optional. This nonmanual is a "side-to-side headshake" which usually appears only on the manual negator as in (131.a). In contrast, in NGT the "side-to-side headshake" commonly spreads onto other sentence elements, as, for instance, the direct object and the verb in (131.b)[41].

131.

                                             neg

 a. PAOLO CONTRACT SIGN NOT   [LIS: Geraci 2005, ex. 20]
    'Paolo did not sign the contract'

 b.   [NGT: Pfau 2008b: 201]

                                             neg

 MIJN COLLEGA IX$_3$ OPDRACHT BEGRIJPEN
 my   colleague ix   task   understand
 'My colleague does not understand the task'

---

[40] A sign language which behaves like LIS in this respect is Jordanian Sign Language (Lughat al-Ishāra al-Urdunia − *LIU*, Hendriks (2007, 2008)), which requires a manual (i.e. lexical) negation. LSC and DGS behave like NGT in having a nonmanual negation (Pfau & Quer 2007).

[41] Notice that LIS negative sentences also bear another NMM, namely "body-tilted-backward and head-tilted-to-the-side" (Franchi (1987:169), in Italian «le spalle sono spostate all'indietro ed il capo è leggermente inclinato da una parte»), which spreads over strings of signs. Its function and distribution still require investigation in order to refine the present analysis. However, this nonmanual marker alone is not sufficient to express negation and I will not consider it in this dissertation.

However, in LIS the sentence-final lexical marker NOT is required to make the sentence grammatical, as in (130.a), because the nonmanual marker alone is not sufficient to negate a proposition, as shown in (132.a). In NGT, in contrast, the "side-to-side headshake" alone in (130.b) is sufficient to encode negation, while the use of the lexical sign in the absence of nonmanual marking does not *per se* make the sentence grammatical (132.b).

132.
                    <u>   neg   </u>

    a.   *(IX$_1$) $_1$ASK$_{LFT}$ [LIS]

    b.   *(IX$_1$) $_1$ASK$_{LFT}$ NOT   [NGT]

       'I do/did not ask him/her'

The LIS NMM is not restricted to the clause-final negative particle NOT; it also accompanies other negative signs, for instance, negative quantifiers, and may then spread over a longer string of signs. Yet, this spreading does not occur randomly, but is related to the position of the negative element (see Geraci 2005). When the negative sign is clause-final as in (133.a) and (134.a), the NMM only accompanies the negative sign. When it is in situ as in (133.b) and (134.b), the NMM spreads between this position and the end of the clause, that is, it extends as much as to include the in situ negative element. Geraci (2005) states that «the Neg-NMM starts from the position where the n-word is met» referring to his example (35), where the n-word (i.e. the negative quantifier) appears in situ and the NMM reaches the end of the clause. Thus, he assumes that the negative NMM starts from the in situ position and spreads rightwards. This may suggest that the spreading has a direction according to Geraci and, consequently, that it involves some sort of movement (given that direction exists when something moves). However, here we do not necessarily have to do with something that moves. Rather, we just have to do with something (the NMM) that is longer or shorter depending on certain conditions. The data show simply that one boundary of the NMM is invariably the end of the clause and that the other boundary may be closer to or farther away from it, but this does not prove that one boundary is the starting point of the NMM and the other is the endpoint. For this reason, I restrict myself to observing that the NMM extends or spreads "between" position/elements, rather than saying that it starts, extends or spreads "from...to". Here, I would also like to be clear about

the fact that the spreading of the negative NMM does not go beyond the end of the negative clause. If a LIS sentence contains a negative clause, followed by an affirmative clause, only the first clause displays the negative NMM. That is, the NMM reaches the end of the clause, not necessarily the end of the sentence. In (138.b) and (139.b) the NMM spreads between the negative sign and the end of the clauses.

133.
a. <u>neg</u>
    GIANNI SIGN NOTHING[42]   [LIS: Geraci 2005: ex. 17]
    'Gianni signed nothing'

b. <u>neg</u>
    GIANNI NOTHING SIGN   [LIS: Geraci 2005: ex. 35]

134.
a. <u>neg</u>
    CONTRACT SIGN NOBODY   [LIS: Geraci 2005: ex. 16, 22]
    'Gianni signed nothing'

b. <u>neg</u>
    NOBODY CONTRACT SIGN   [LIS: Geraci 2005, ex. 23]

A similar phenomenon is observed in NGT (135.a). The negative adverbial NOT-YET appears in preverbal position (again unlike LIS) and the NMM spreads from its position to the end of the sentence. Unfortunately, I have not been able to determine whether this position is the only option in NGT or whether the clause-final position is also available for NOT-YET, as it is in LIS. LIS, too, has a clause-final sign that Geraci (2005) glosses NEG and labels "presuppositional not" referring to Zucchi (2003). This sign seems to have the meaning of 'not-yet'. Unfortunately, I have no data about the NMM accompanying this sign, although Geraci (2005) claims that negative signs bear a NMM. Notice however that NGT has NMM spreading also in (135.b), where the negative element is clause-final.

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[42] The non-manual marker is not reported in Geraci (2005), but it appears on the same sentence in Cecchetto, Geraci & Zucchi (2009: ex. 23b).

135.

    a.   [NGT: GIDS, ontkennende zinnen 18/24]

<div align="center">neg</div>

AIRPLANE NOT-YET LAND

'The airplane has not landed yet'

    b.   [NGT: Coerts 1992:209]

<div align="center">top   neg</div>

AIRPLANE COME NOT

'As for the airplane, it did not come'

As for negating a sentence which contains a modal, it has been repeatedly observed that sign languages commonly employ specific negative modal signs, which encode both the modal meaning and negation at the same time, instead of applying the standard negation strategy employed with lexical verbs (Zeshan 2006; Neidle et al. 2000; Skant et al. 2002; Aarons et al. 1995; Shaffer 2002; Yang & Fischer 2003). For instance, Pfau & Quer (2007) report that DGS and LSC employ negative modals which they gloss as DARF^NEG (DGS for 'may not'), MUSS^NEG (DGS for 'not have to'), and PODER-NO (LSC, 'cannot'). Crucially, the DGS sentence in (136.a) cannot be negated by adding the standard negative particle NICHT ('not') to the modal as in (136.b), nor by adding the standard negative NMM 'headshake', which usually can be superimposed to other verbs as in (136.c). Only the specific negative modal sign DARF^NEG in combination with the NMM (136.a) is grammatical. Constructions (136.b) and (136.c) are not grammatical. Note that Pfau & Quer distinguish between fully suppletive negative forms and semi-transparent negative forms that they define as "cliticized". Here, I will simply make a distinction between modals that combine with the (manual or nonmanual) negation in the same way as lexical verbs do (that is, according to the standard manual or nonmanual strategy of the language), and modals that resort to specific, dedicated negative forms. The reason for this will become clear in the analysis in §3.2.4.

136. [DGS: Pfau & Quer 2007: 8]

   a.

     <u>   headshake   </u>

     GARTEN   IX₃   KIND++   SPIEL DARF^NEG

     garden   ix   child-PL   play may^NEG

     'The children may not play in the garden'

   b.

                        <u> h.shake </u>

     *GARTEN IX₃   KIND++   SPIEL DARF NICHT

      garden   ix   child-PL   play may not

   c.

                    <u> h.shake </u>

     *GARTEN   IX₃ KIND++ SPIEL DARF

      garden   ix   child-PL play may(+NEG)

A similar phenomenon occurs also in LIS and NGT. LIS has specific negative modal signs at its disposal which I will gloss CAN^NEG [43], MUST^NEG, ABLE^NEG/UNABLE [44] (similar to DEAD but accompanied by a blow). NGT has signs for CAN^NEG and MAY^NEG (*mag-niet* in Dutch, see GIDS and the Effatha website www.kegg.nl/egg_gebaren.php). As far as I could observe, the NGT sign MAY^NEG also has the function of LIS MUST^NEG, 'mustn't'. I have not found any specific NGT negative sign for MUST^NEG. In fact, I have found two signs for MAY^NEG which are both glossed as MAY-NOT (*mag-niet* in Dutch) on the Effatha website. One of these combines the sign MAY and the sign NO/NOT (*niet/nee* in Dutch). Despite the appearance, this is not a standard negative form in NGT because verbs are usually negated only with a negative NMM in

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[43] I gloss them with ^NEG, following Pfau & Quer (2007), in order to make clear that these negative modal signs do *not* contain any sign NOT. However, Pfau & Quer (2007) use the gloss ^NEG to represent only negative modal forms of DGS and LSC that they take to result from cliticization of negative features onto the modal. They gloss suppletive negative forms in a different way. In this dissertation, I employ ^NEG to gloss all negative modal forms that do not combine modal and negation according to the pattern of standard LIS and NGT constructions (i.e. neither verb + negative lexical particle NOT, nor verb + negative NMM).

[44] Recall that in principle, it is not possible to decide whether these signs are verbs or adjectives. Hence my hesitation in using only one gloss for each sign. It is not entirely clear to me whether ABLE^NEG/UNABLE means just 'I am not able' or if it bears also other nuances of meaning.

NGT. The other sign seems to be just the sign NO/NOT with a longer movement. In GIDS, I have found no such signs. In order to convey the idea of "do not want", LIS uses a sign roughly glossable as DISLIKE/LIKE^NEG[45], which is related to the sign LIKE but bears a "refusal" facial expression. NGT, too, resorts to a suppletive form glossed WANT^NEG (*wil-niet* in Dutch, see Effatha website), which contains a refusal expression. The following examples illustrate the use of negative modals in LIS and NGT. Note that, because of the possible variation observed in the ordering of NGT verbs and modals (see §3.1.3), the NGT examples do not include lexical verbs. This makes it possible to focus on the modals and to ignore their position with respect to a lexical verb (nonmanuals are not transcribed in these examples).

137.
  a. (IX_1) $_1$ASK$_3$ CAN^NEG   [LIS]
      'I cannot (possibly) ask him/her'[46]

  b. (IX_1) CAN^NEG   [NGT]
      'I cannot/am not able'

138. (IX_1) $_1$ANSWER$_2$ ABLE^NEG   [LIS]
      'I am not able to answer him/her'

139.
  a. (IX_2) $_2$GO$_3$ MUST^NEG   [LIS]
      'You must not go there'

  b. (IX_2) MAY^NEG   [NGT]
      'You must/may not'

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[45] If a more suitable word is available to gloss the sign, both that word and the ^NEG form may be indicated (e.g. DISLIKE/LIKE^NEG). In this case, DISLIKE is more suitable because it stresses the fact that the sign indicates a refusal, rather than just absence of pleasure. Distinctions like this are relevant for the analysis (in the second part of the chapter).

[46] Geraci (2005) lists also the negative construction with standard negation CAN+NOT as grammatical (CAN NON, in his example (12)). My informants, however, claim that the combination of the modals CAN and MUST with the negative particle NOT results in ungrammaticality. Maybe, in this case different varieties of LIS are at stake.

Crucially, as far as I could observe, both languages use standard negative constructions to convey the meaning of 'need not / do not have to / haven't got to'. As shown in (140) and (141), LIS employs its lexical negation while NGT adds the negative nonmanual marker to the base form of the modal.

140. (IX**2**) **2**GO**3** OBLIGATION NOT   [LIS]
      'You don't have to go there / you need not go there'

                                    neg
141. (IX**2**) HAVE-TO   [NGT]
      'You don't have to / you need not'

3.1.5 Summary

Two important observations emerge from the discussion in the previous sections. First, although LIS and NGT do not have tense inflection, they nevertheless have a rich system of verbal inflection since (some of) their verbs do not only overtly agree with subjects and objects, but also encode aspectual features. Secondly, although the verb in both languages tends to follow subjects and objects (i.e. the languages are SOV), it is not always clause-final since it can be followed by a variety of functional elements – even though these elements and their linear orders are partially different in the two languages. As for person agreement, LIS and NGT verbal inflection can be realized in different ways (synthetically on the verb or by means of specific functional signs) depending on different verb classes (agreement/spatial versus plain verbs). Interestingly, the two languages behave alike with respect to synthetically inflected verbs, but employ language-specific strategies when they mark agreement with functional signs. In the context of plain verbs, LIS subject agreement is encoded by a preverbal index (clitic or weak according to Bertone 2007), while object agreement is encoded by a postverbal index. In contrast, in NGT both subject and object agreement are encoded on a postverbal auxiliary (Bos 1994). Moreover, the person feature of the subject may be marked by a postverbal unstressed index (Bos 1995), which can co-occur with a subject (pro)noun in canonical position (that is, preceding both object and verb). NGT shows also double agreement.

As for aspect and modal markers, the linear order of markers in the two sign languages is not always easy to determine. However, I was able to establish that LIS shows the orderings **Verb-(Cel**erative/**Dur**ative)-**Perf**ect, **V**erb-**Mod**al and, in general, **V-Asp**ect-**Mod**. NGT shows the sequences **V-(Cel/Dur)-Perf** and both **Mod-V** and **V-Mod**. Also, the unmarked position of the LIS adverbial ALWAYS is postverbal, while its NGT counterpart appears preverbally. This is reminiscent of the nominal quantifier ALL, which was shown to be postnominal in LIS, but prenominal in NGT (see §2.1.2).

It is important to note that modals usually do not show subject agreement unless the verb is topicalized, since agreement is usually realized on the lexical verb (at least on synthetically inflected verbs). Aspectual inflection, too, is not realized on modals, but on lexical verbs or through lexical aspectual markers added after the verb. In turn, lexical aspectual markers, like modals, do not inflect for person agreement. These observations form the basis of the analysis that I propose in §3.2 for the position of modals and aspectual markers. This analysis will then be extended to negation.

Negation is primarily expressed nonmanually in NGT and lexically in LIS, where a NMM also occurs, however. Usually, the negative NMM spreads over strings of signs in NGT, but is restricted to the clause-final negative sign in LIS. Yet, with negative arguments[47] in situ, the LIS NMM spreads. It extends over a chunk of the sentence long enough to include the in situ negative sign, that is, it extends between the position of the in situ negative sign and the end of the clause.

LIS and NGT standard negation is used with lexical verbs and with the modals expressing 'obligation', 'to have to/need'. With other modals, dedicated negative modal signs are employed, which have their own specific lexical form different from their positive counterpart. Due to the specific properties of these two sign languages, it is not easy to determine morphologically and syntactically whether their modal signs are really modal markers (or verbs) or whether they are just adjectives or adverbs[48].

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[47] Possibly, this is true even with other negative elements in situ, for instance, with adverbs as NOT-YET. This would make LIS even more similar to NGT. However, I have only been able to collect data about negative arguments in LIS.

[48] Bertone (in preparation) explicitly points out that some LIS modals could well be adjectives and that their status is still to be determined. Some of them can indeed be used as adjectives or even nouns and the way they are glossed or called colloquially

In the literature, however, they are usually classifed as modals and in the following sections, I will try to analyze them as such.

3.2 Analysis

3.2.1 Introduction

After having shown that the two sign languages under investigation, LIS and NGT, display both overlapping and diverging (morpho)syntactic properties, we shall now see how the ordering and the properties of some elements within the IP domain of LIS and NGT can be accounted for. In particular, I attempt to verify whether they can be accounted for within an antisymmetric model.

The data described in the previous section are not sufficient to allow for a conclusive and comprehensive analysis of the IP domain of NGT and LIS. The results will thus be necessarily provisional. However, they reveal some specific patterns in the ordering of elements. In addition, they also bring to light some remarkable properties of these sign languages which, in a very general way, may favour an analysis in terms of a Specifier-Head-Complement deep structure. The analysis is divided into two parts. First, in §3.2.2, I provide a general discussion on antisymmetric versus nonantisymmetric hypotheses about the structure of IP. Second, in §3.2.3 and §3.2.4, I present a discussion of negation and negative modals, respectively. General conclusions follow in §3.3. As mentioned earlier, the uncertain status of LIS and NGT modals imposes some limits on the analysis, even though the order of signs can be accounted for in the majority of cases. Since in the literature, they are generally classified as modals, I will analyze them as such. However, the uncertainty concerning the status of these signs makes it difficult to analyze properly some of the examples, especially some LIS sentences with two co-occurring modals (see §3.2.4).

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is testimony of this fact. For instance, the sign for CAN is often labeled both PUÒ ('can') and POSSIBILE ('possible'). Likewise CAN^NEG is labeled NON-PUÒ as well as IMPOSSIBILE. The sign CAN in LIS is also able to occur with a numeral in sequences like CAN TWO, CAN THREE ('there are two/three possibilities/options'). I have not explored this possibility for NGT. However, if modal signs are taken as adjectives with a null copula 'it is (im)possible that', their analysis is trivial. Here, I am exploring the possiblity to treat them as modals.

As already mentioned in §3.1, I will not account for the SOV order, nor will I analyze the agreement system of LIS and NGT in this dissertation. Clearly, in an antisymmetric model, the SOV order must be derived from an underlying SVO order through leftward movement of the object. Thus, for instance, Zwart (1997) suggests a derivation of SOV order in Dutch assuming a head-initial deep structure. In LIS and NGT, there seems to be an interesting relation between the agreement system and SOV order, but this issue has to be treated separately in future research. In this dissertation, I can only suggest some speculations concerning this issue. However, these are not presented in this chapter. Rather, they will be briefly mentioned in the final discussion in chapter 6 for two reasons. First, these speculations are based on a comparison between the preverbal position of object NPs and the postverbal position of object subordinate clauses, but subordinate clauses are discussed only in the subsequent chapters (chapters 4, 5 and 6). Secondly, I take as a starting point some general counterarguments against antisymmetry brought forward by Cecchetto, Zucchi & Geraci (2009), which I address briefly in chapter 6 after presenting the general conclusions of this dissertation. This means that the analysis proposed in the following does not account for the data presented in §3.1.1, although it is based on some phenomena described there. Rather, it accounts for the data in §3.1.2, §3.1.3, and §3.1.4.

3.2.2 Structure of IP: the position of aspectual and modal projections

This section analyzes the ordering of the verb vis-à-vis modals and aspect markers in light of the fact that LIS and NGT person agreement, especially subject agreement, usually appears on the synthetically inflected verb, even when modals and aspect markers occur. On the basis of this, I propose an antisymmetric structure and a hierarchy of projections in the spirit of Cinque (1999, 2006) where only leftward movements apply.

Based on the ordering of elements in SOV sign languages, such as LIS and NGT, it has often been suggested that they should be treated as head-final languages. More generally, a number of SOV and SVO sign languages have been analyzed assuming (parts of) deep structures where heads and possibly specifiers are located to the right of the complements (a.o. Pfau & Glück (2000) for DGS; Quer (2002) for LSC; Petronio &

Lillo-Martin (1997) and Neidle et al. (2000) for ASL; Cecchetto et al. (2004) and Branchini & Donati (2007, 2009) for LIS). From this perspective, the ordering **Verb-Mod**, **V-Asp**, or **V-Neg** in sign languages is taken as a direct effect of the head-final ordering of projections. For instance, Pfau & Quer (2007) propose the derivation (142.a) for LSC and DGS **V-Mod** sequences, whereas Geraci (2005) proposes (142.b) for the LIS sentence-final negation[49]. Such a view entails that the verb stays in situ or very low in the structure.
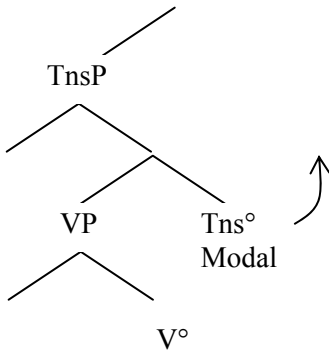
142. a. DGS and LSC   b. LIS
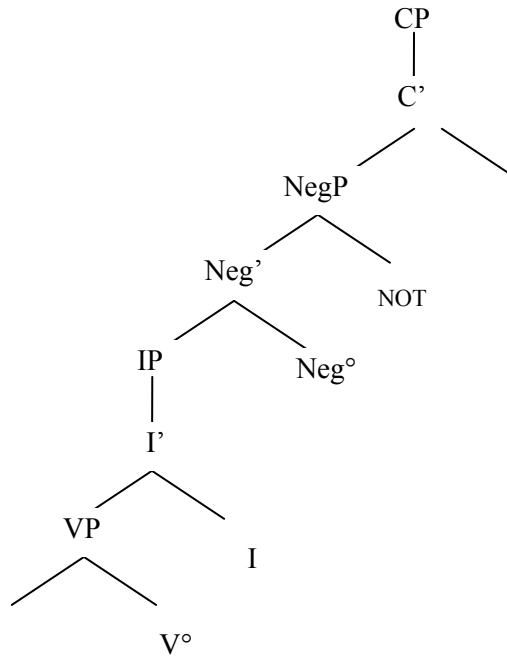
In (142.a) the modal is generated higher and to the right of the verb and raises further up rightwards. In (142.b) the negation sits higher and to the right of both the verb and the inflection phrase, so that, even though the verb raises to the head of IP, the negation still remains higher and to the right of the verb. Thus, (142.b) should derive correctly the clause-final

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[49] In Cecchetto et al. (2009), this structure is further refined. However, for the purpose of this discussion, the simplified version of Geraci (2005) is sufficient.

position of the LIS lexical negator. As for the position of modals, if we consider LIS and NGT as head-final languages, it is to be expected that the simple structure in (142.a), originally proposed for DGS and LSC postverbal modals, can also derive the postverbal modals of LIS and NGT[50].

Within this approach, sequences like LIS WORK MUST (117) or NGT SIT CAN (123) are easily accounted for. Also the postverbal position of LIS lexical negation in PAOLO CONTRACT SIGN NOT (131.a) is straightforwardly derived. Along the same lines, one can derive EAT DONE/READY (100.a), (100.b) and TASK[fast] DONE/READY (111) by adding aspectual projections to these structures. Such an account also has the advantage of being in line with assumptions usually made for other languages. Indeed, in languages like Italian (or Dutch), the modal is considered to raise while the lexical verb stays lower. Given that subject agreement occurs above VP, in an IP/AgrSP projection to which finite French and Italian verbs and finite Italian auxiliaries raise (Pollock 1989; Chomsky 1991, 1995; Belletti 1990, 2009) and given that Italian modals agree with their subjects, Italian modals, too, must raise to a structural position higher than the lexical verb, at some point of the derivation. The same must be concluded for Dutch modals, which also show subject agreement, given Zwart's (1997) assumption that finite verbs raise to AgrsP in Dutch subject-initial clauses. In contrast, nonfinite verbs, such as infinitives and participles, remain lower in the structure. Notice that also Grohmann (2000) suggests that modals raise from Mod° to T°.

Aspect, too, is assumed to be encoded higher than the lexical verb. Travis, Guifoile & Hung (1992) propose an aspectual projection higher than the one occupied by the lexical verb (though both are within the VP-shell) for Tagalog. Cinque (1999) proposes a universal hierarchy according to which various aspectual and modal projections are located higher than VP. Notice that concerning sign languages, Aarons et al. (1992), assume, too, that ASL has an aspectual projection higher than VP (but lower than subject agreement). Neidle et al. (2000) also claim that AspP is higher than VP in ASL (but higher than subject agreement)

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[50] To the best of my knowledge, to date, no tree structure has been proposed for NGT. However, I adopt (142.a) here because it is a very simple head-final structure. If even such a simple structure turns out to be unsuitable for the NGT (and LIS) data, this will be an important clue that head-final approaches to these sign languages are faced with some problems.

It may thus be tempting to adopt this approach for LIS and NGT, assuming that in these languages, too, the verb is structurally low.

However, the fact that in these two sign languages, verbs bear a rich range of morphemes (see the discussion in §3.1.1, §3.1.2, and §3.1.5) has important consequences for this approach. First, in languages with rich verbal inflection, the inflected element is assumed to undergo movement[51], as we have just seen. This would require also the NGT and LIS verb to move. Secondly, if the verb moves, does it move to the left or to the right? If rightward verb movement applies, some problems arise with respect to LIS and NGT. Recall, indeed, that in these sign languages, the inflected verb precedes the invariable perfective marker as in (143.a), possibly after combining with durative/celerative morphemes. Along the same lines, in LIS the postverbal modal is usually invariable, while the lexical verb is inflected, as in (144.a). In contrast, languages such as Italian have inflected modals and auxiliaries that precede the lexical verb, which surfaces in an invariable participial (perfect) or infinitival form as in (143.b), (144.b), (144.c). The verb may optionally combine with object (here, dative) clitics, but it does not carry any subject agreement. Thus, the inflected element bearing subject agreement occurs to the left of the invariable one in LIS and NGT, as it does in Italian, in all the sentences in (143) and (144). To make this clearer, the ordering of the relevant elements (subject agreement, modal and aspect) is shown in italics in an additional line between the glosses and the interlinear translations.

143.

    a. $_3$PHONE$_1$ READY/DONE   [LIS/NGT]
         sbj.agr on the verb   *perfect marker*
         'S/He has phoned me'

    b.   Mi   ha   telefonato   [Ital.]
        CLT   *sbj.agr on the aux.*   *perfect verb*
        (to) me   has   telephoned
        'S/He has phoned me'

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[51] Usually the verb is assumed to undergo head movement. As argued later in this section, both the possibility of head movement and the possibility of phrasal movement must be considered, although I am personally inclined to follow Cinque's proposal that the verb raises with XP movement. However, further investigation is necessary.

144.

a. ₁ASK**₃**   CAN   [LIS]
    sbj.agr. on verb   modal
    'I can ask him/her'

b. Posso   domandargli/le   [Ital.]
    sbj.agr. on modal   infinitive verb(with clitic)
    (I) can   ask him/her
    'I can ask him/her'

c. Gli/Le   posso   domandare   [Ital.]
    CLT   *sbj.agr. on modal   infinitive verb*
    (to) him/her (I) can   ask
    'I can ask him/her'

Under a "head-final" hypothesis, this would require inflection, especially subject agreement, to be lower than aspect and modals in the structure of LIS and NGT, differently from assumptions commonly made for other languages (for instance, past participles, which have a perfect aspect meaning, are lower than inflected verbs and auxiliaries in Pollock (1989), Belletti (1990, 2009), and Chomsky (1991, 1995); in Travis, Guilfoile & Hung (1992), aspect is taken to be inside the VP-shell, that is, lower than IP/AgrSP). Indeed, in head-initial languages such as Italian, the inflected modal is assumed to raise leftwards to IP for subject agreement, while, according to a structure where "the higher you go, the more on the right you are", the LIS/NGT inflected verb should follow the invariable modal or perfective marker if it raised above them. In other words, despite the apparent parallelism with head-initial languages (the modal also raises in LIS and NGT), there is a major inconsistency, namely the fact that the derivation predicts a different sentential position for LIS and NGT verbal agreement with respect to head-initial languages, contrary to fact.

Although it is not clear where subject agreement sits with respect to tense, aspect, and modals (Cinque 1999, 2006; Julien 2002), even a very consistently head-final language such as Turkish (145) has the modal or aspectual affix "trapped" between verb and subject inflection.

145. Oku-yabil-ir-im   [Turkish: Kornfilt 1997: 375]
       verb-mod-tns-agr.
       'I can/am able to/am permitted to read'

The 1st person agreement *–im* in (145) appears further away from the verb stem, and hence should be located higher in the structure than the modal. Indeed, according to Baker's (1985) Mirror Principle, the order of affixes in morphology reflects the syntactic derivation. In Baker's (1985: 378) words, given a sequence *verb-affixA-affixB* and the cyclic nature of morphology, «the syntactic process associated with affixA must occur before the syntactic process associated with affixB». When raising is considered, earlier syntactic processes are those which involve features hosted in lower projections and earlier steps of the movement, whereas later syntactic processes involve higher projections and later steps of the movement. Thus, informally, we can say that Baker's principle ultimately reflects the relation "the closer to the verb stem, the lower in the structure, and the farther from the stem, the higher in the structure". In contrast to Turkish, the LIS and NGT subject agreement (if overt) appears directly on the verb.

Leaving now Turkish aside, we have seen that a head-final approach based on rightward movement can account for the fact that the orders **V-Asp** and **V-Mod** observed in LIS and NGT are the opposite of what has been observed in head-initial languages, but it cannot account for another important difference, namely that in the former languages subject agreement is encoded on a different element than in the latter languages. In other words, such an approach fails to capture an important parallelism between LIS/NGT, on the one hand, and head-initial languages, on the other hand: the inflected element – be it a lexical verb or a modal/aspectual marker – precedes the uninflected one. Despite this parallelism, in order to derive the grammatical order of signs, the rightward movement account requires the additional assumption that LIS and NGT subject agreement occurs in a structural position distinct from the position assumed for other languages.

Alternatively, in order to maintain that heads (and specifiers) are on the right and that subject agreement occurs above aspect and modals, further assumptions are necessary. In principle, it is possible either to assume lowering of features, instead of verb raising, or to assume

rightward remnant movement. However, these hypotheses are faced with problems. First, assuming feature lowering means that agreement features in LIS and NGT move to the verb, which is located lower and to the left of inflection. Crucially, one is then forced to switch the movement from "raise-the-verb" to "lower-the-features" just to maintain that it is leftward. Thus, in this case, too, an additional stipulation is necessary to correctly derive the order of signs, despite the parallelism observed in the distribution of subject agreement in LIS, NGT and head-initial languages as Italian[52]. Second, one could still posit a rightward remnant movement by which the inflected element (the verb), high and on the right, is crossed over by an XP containing the uninflected element (as well as the trace of the verb). In this way, the uninflected element raises above and to the right of the inflected element, that is, modals and aspectual markers raise to the right of the verb. This ensures that the position of postverbal aspectual markers and modals is derived correctly even in the presence of verb raising. In doing so, however, the head-final hypothesis loses its appeal as a simple theory that should be preferred because of its ability to explain transparently what other theories explain in a more complex way. As it appears in this dissertation, a Spec-Head-Compl structure is often associated with the idea of remnant movement to derive the observed surface orders of signs or words. In this light, remnant movement might appear as an additional stipulation that somewhat complicates the derivation. However, in the present context, the data would require remnant movement also with head-final structures. At this point, preferring a rightward movement derivation for LIS and NGT, over the leftward movement derivation already employed for Italian, appears as a choice that unnecessarily prevents a uniform account for LIS, NGT, and head-initial spoken languages.

In conclusion, a nonantisymmetric approach to LIS and NGT would require additional stipulations (a low position of AgrP or lowering of agreement features) or, at best, would introduce an unnecessary element of difference between these sign languages and head-initial spoken languages, such as Italian. Moreover, in all the three rightward movement accounts sketched above, the fact that LIS and NGT subject agreement precedes modals and aspectual markers becomes a further burden for the

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[52] I thank Roland Pfau for drawing to my attention the fact that lowering of features would have to cross other heads, an assumption that most scholars would probably exclude.

analysis, in the sense that it appears as an additional, independent phenomenon which the analysis must account for (in addition to deriving the grammatical order of signs).

In contrast, an antisymmetric approach to LIS and NGT does not require additional assumptions and, at the same time, provides a uniform account with head-initial spoken languages, while relating the position of LIS and NGT subject agreement to other properties of these sign languages. In fact, with a Spec-Head-Compl structure, movement in LIS and NGT is consistently leftward and upward just as in head-initial languages such as Italian. The structural position of (subject) agreement, although not known in detail, can simply be taken to be as high as in head initial languages. This derivation is sketched in (146).

146. LIS orders **V-Asp** and **V-Mod** (with Spec-Head-Compl)
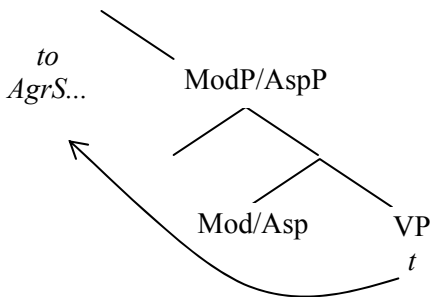
As (146) shows, two parallelisms are brought to light between NGT and LIS, on the one hand, and head-initial languages as Italian, on the other hand. First, LIS and NGT subject agreement occurs above modals and aspect markers and therefore, necessarily precedes them. Consequently, the element bearing subject agreement precedes the invariable one in LIS and NGT, just as in head-initial languages. Second, LIS and NGT verbs raise leftwards toward the position of subject agreement as do finite verbs (and auxiliaries) in head-initial languages. No rightward movement is necessary.

Moreover, the Spec-Head-Compl hypothesis also relates two otherwise unrelated properties of these sign languages. In structure (146), the fact that subject inflection occurs on the verb and appears to the left of other functional markers is a direct effect of leftward movement of the

verb. Or, conversely, the order of elements is straightforwardly derived as a consequence of subject inflection being attached to the verb, rather than to modals or auxiliaries[53]. LIS **V-Perf** and **V-Mod** orders are thus swiftly explained, as well as NGT **V-Mod** sentences like (122). Yet, this derivation can only apply partially to NGT. In fact, we have seen above that in this language, the inflected verb precedes the aspectual perfective marker, but does not consistently appear before modals. Rather, both orders **V-Mod** or **Mod-V** are attested, in contrast to the single order **V-Perf**. This, however, can be put in relation to what we observed in the LIS example (120), repeated here as (147), where both modal and aspectual markers are postverbal and appear in the order **V-Perf-Mod**.

147. IX$_{\text{RGT RGT}}$PHONE$_{\text{LFT}}$ DONE CAN   [LIS: repeated from (120)]
    'He has possibly phoned her'
    'It is possible that he has phoned her'

Extending the Mirror Principle to the present analysis, the LIS ordering derives from a hierarchy **Mod>Asp>V** and successive leftward movements. First, the verb raises to the left of aspect and then the verb and the aspect marker raise together to the left of the modal as sketched in (148). This assumption, in turn, implies that there is an intermediate step in the derivation, hence a position in the structure, where verb raising could stop. If the verb stops in this intermediate position, it precedes aspectual markers, but follows modals, as is indeed possible in NGT (in LIS verb raising proceeds further up). The first step occurs obligatorily in both languages while the second step occurs in LIS, but is optional in NGT.

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[53] It is not necessarily meant here that subject inflection triggers the raising. The present analysis captures the relation between the order of elements and the position in which subject agreement appears, i.e. on the lexical verb. Whatever be the cause of the former, it is also the cause of the latter.

148. LIS/NGT **V-(Perf)-Mod** ordering and NGT **Mod-V** ordering (with Spec-Head-Compl)
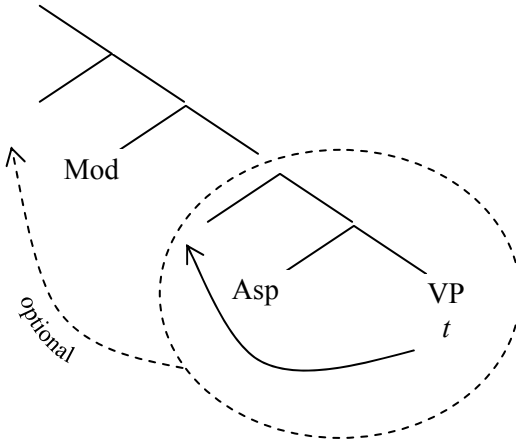
At this point, considering that various aspectual markers can co-occur with the verb and that both languages show the ordering **V-(Cel/Dur)-Perf**, the structure can be further refined assuming separate projections for different aspect types. In particular, the projection dedicated to celerative/durative aspect is located below the one dedicated to perfect aspect, which in turn is located below the modal projection. Thus, (148) can be expanded into (149).

149. LIS/NGT structure (with Spec-Head-Complement)
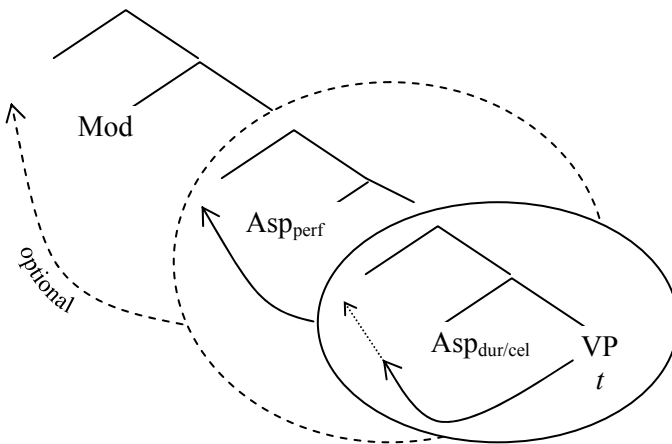
This structure matches Cinque's (1999, 2006) universal hierarchy of projections: **(Mod) >...Asp$_{perf}$>...Asp$_{dur}$ >...V** and **(Mod) >...Asp$_{perf}$ >...Asp$_{celer\ I}$> ...V**. Under this view, LIS and NGT diverge only to the extent to which leftward raising applies. Not only are these languages minimally different from (other) head-initial languages by conforming to such universal hierarchy, they are also minimally different from each other. The differences lie only in what element raises (i.e. modal or auxiliary in Italian, the lexical verb in LIS and NGT) and in how far up the raising proceeds (in LIS it reaches a projection higher than in NGT).

This leaves open the question whether the raising actually involves a head or a maximal projection, that is, whether we are dealing with X° movement or XP movement. The structures represented so far suggest that most of the movements involved are raising of some maximal projections. However, in principle, some head raising cannot be excluded. For instance, the first step of the derivation in (149) is represented by a partially dotted line to make clear that either head movement or phrasal movement may be involved. The durative and celerative morphemes appear incorporated in the verb as "prosodic" features (e.g. hold or speed) which modify its movement and cannot be detached from it: this would suggest a head movement V° → Dur°/Cel°. Alternatively, one can assume VP movement to the specifier of the lower aspectual projection, where the verb agrees with a lexically empty head Dur°/Cel° which, however, hosts the aspectual features. The aspectual marking appears then on the verb because of Spec-head agreement, rather than direct checking/incorporation of the prosodic features of the aspectual head. The perfect marker and the modals, in contrast, are realized as free lexical morphemes. These have an "independent life" with respect to the verb, in the sense that the verb can be topicalized (and marked by "raised eyebrows") while they remain part of the rest of the clause (without topic marker). In this case, the modal may even inflect autonomously as, for example, in (118.a). Such behaviour suggests that in the case of modals, and possibly the perfective marker, the raised verb acts as a maximal projection which can even be topicalized on its own. This, in turn, implies that the verb is able to occupy specifier positions. It is then tempting to generalize the XP movement to all instances of verb raising. Cinque (2008b) explicitly proposes XP movement of the verb around modals, aspect, and tense projections, which he takes to parallel XP movement of the noun around demonstratives, numerals, and adjectives:

«The same parameters (with VP in place of NP) [...] appear to provide an account of the attested and unattested orders of Mood, Tense and Aspect with respect to the verb.» (Cinque 2008b: 10).

This hypothesis requires further research to be confirmed. However, I would like to point out that it is less costly to make consistent use of the same type of movement, rather than specifying for which projections X° movement applies and for which ones movement of an XP applies. This would support the generalization of XP movement. In addition to this, it is interesting to note that the derivation suggested in (148), (149) is not too different from what I propose for the DP in the two sign languages in chapter 2. As I have argued there, the NGT noun raises leftwards across lower projections, but optionally past higher ones, while the LIS noun always raises further leftwards. In fact, in both languages, the distribution of the verb with respect to aspect markers and modals parallels the position of the noun with respect to adjectives. The LIS noun appears to the left of all modifiers, as the LIS verb does, while the NGT noun may appear to the right of some higher modifiers, just like the NGT verb (interestingly, even the unmarked position of NGT adverbs ALWAYS/OFTEN, which quantify over events, is preverbal, just as the nominal quantifiers ALL/MANY are prenominal; conversely, in LIS both adverbs and quantifiers appear in the opposite order[54]).

Also notice that, in principle, the different positions of the NGT modals might be related to distinct nuances of meaning. For instance, double modal constructions in NGT may involve focalization (van den Bedem (2006); also see Petronio & Lillo-Martin (1997)). At present, I do not have any evidence for distinct readings associated with preverbal and postverbal modals, but if future investigation revealed that the unmarked position of modals is postverbal in NGT as it is in LIS, then the same derivation could fully apply to both languages.

Another possibility to explore in order to explain the "floating" position of NGT modals with respect to the verb, is that this peculiar behaviour may be related to the special properties of NGT verbal

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[54] Cinque (1999), however, suggests that 'always' sits in the specifier of AspPerfP.

agreement, especially to the optional presence of double agreement, which suggests two distinct positions for person inflection in NGT[55].

As for LIS inflected postverbal modals, such as in (118.a), they may appear as a counterexample to the analysis presented here. In fact, this derivation does not predict that the verb precedes a finite modal, because it is the modal itself that bears subject agreement, given its finiteness. However, the verb which precedes the modal in (118.a) is marked by a 'raised eyebrows' facial expression, a NMM which signals topichood (see chapter 4). Crucially, LIS (and NGT) topics occupy the left periphery of the sentence. Thus the modal, inflected and yet postverbal, does not conflict with the present analysis. Rather, in these cases, the modal raises leftwards to check inflection, but is crossed over by phrasal movement of an XP containing the verb, motivated by the need for the verb to reach the topic projection to the left of the IP domain. As a result, the verb still appears to the left of the modal, even though the modal has previously raised to check person inflection features.

3.2.3 The behaviour of negation

This section attempts to extend the antisymmetric model proposed for aspect markers and modals in the previous section to the derivation of negative clauses. The distribution and the extension of NMMs which occur in negative clauses is explained on the basis of some assumptions made also for other syntactic phenomena in chapter 4 (and also extended to other constructions that will be treated in chapter 5).

In an antisymmetric framework, the leftward raising proposed above can be extended to explain the functioning of negation. Within this approach, the scope of the NMM reflects the amount of material raised to (or above) [Spec;NegP], much like what I am going to suggest in chapter 4 for interrogative clauses following Pfau's (2006a) and Aboh & Pfau's (2011) proposal of sentence raising to [Spec;InterP].

Let us first consider LIS. Consider examples (130.a) and (131.a), repeated here as (150) and (151) and compare these to (133.a), (133.b),

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[55] Interestingly, from discussions with the informants, it appears that the agreement auxiliary OP cannot co-occur with the aspect marker READY. Given the different function of these elements (agreement vs. aspect), this behaviour is unexpected. If confirmed, this would suggest that the two elements compete for the same position at some point during the derivation.

repeated as (152.a),(152.b), and to (134.a), (134.b), repeated as (153.a), (153.b).

150. (IX$_1$) $_1$ASK$_{LFT}$ NOT   [LIS]
     'I do/did not ask him/her'

                                  neg
151. PAOLO CONTRACT SIGN NOT   [LIS: Geraci 2005, ex. 20]
     'Paolo did not sign the contract'

152.   neg
     a. GIANNI SIGN NOTHING   [LIS: Geraci 2005: ex. 17]
        'Gianni signed nothing'

                              neg
     b. GIANNI NOTHING SIGN   [LIS: Geraci 2005: ex. 35]

153.   neg
     a. CONTRACT SIGN NOBODY   [LIS: Geraci 2005: ex. 16, 22]
        'Gianni signed nothing'

                              neg
     b. NOBODY CONTRACT SIGN   [LIS: Geraci 2005, ex. 23]

Recall that LIS shows a negative "headshake" NMM only on the clause-final lexical negative particle (151) or negative quantifier/argument (152.a), (153.a). Geraci (2005) assumes that the lexical negation, which bears the NMM, sits on the right in [Spec;NegP]. Along the same lines, the clause-final negative quantifiers NOBODY and NOTHING move from their argumental base position rightwards to [Spec;NegP] and are also associated with the NMM. This correctly predicts that these elements are clause-final and bear the negative NMM. As he points out, however, such elements may also appear in situ if the NMM spreads such that it extends over the respective negative element in its base position as in (152.b), (153.b). He then proposes that in such cases, the negative sign moves rightwards covertly at Logic Form. Taking this perspective, the negative NMM spreads between the in situ position where the sign occurs overtly and the final position where that sign moves covertly. Even though Geraci (2005) suggests a starting point for the NMM, his analysis does

not require to determine a starting point for the NMM. The existence of two positions **between** which the NMM extends is sufficient. (As will become clear, my analysis does not require any specific starting point for the NMM either.) To the best of my knowledge, Geraci (2005) does not specify how the NMM is associated with the negative sign. He observes that the negative NMM patterns like the wh NMM[56]. Apart from this, he simply refers to the spreading of the negative NMM as «the other option (NMM) to establish contact with the head of the chain» (created between the positions of the overt and the covert instance of the negative sign).

Under an antisymmetric account, in contrast, the scope of the NMM reflects the chunk of material moved (leftwards) to [Spec;NegP], simply assuming that the negative NMM is assigned in [Spec;NegP] under spec-head agreement in exactly the same way as interrogative (and topic) NMMs are taken to be assigned under spec-head agreement in chapter 4. Given that negative constructions and wh interrogative constructions pattern alike, as observed also by Geraci, the hypothesis put forward for interrogative NMMs can be extended assuming that the negative NMM is assigned in [Spec;NegP]. According to this line of reasoning, the clause-final negative quantifiers NOTHING in (152.a) and NOBODY in (153.a) are taken to move to [Spec;NegP] (following Geraci, but leftwards), followed by remnant movement of the remaining portion of the sentence to a higher position (i.e. a position even more to the left). Consequently, only the negative quantifiers bear the NMM in (152.a) and (153.a). Along the same lines, NOT in (150) and (151) is merged in [Spec;NegP], as proposed by Geraci. There it receives the NMM, while the remaining material (in this case, the whole clause) raises to a higher position, to the left of the negation and outside the NMM. In (152.b) the negative quantifier NOTHING moves to [Spec;NegP] together with the verb, whereas remnant movement brings the subject to a higher position. The NMM then spreads over negative quantifier and verb. In (153.b) the negative quantifier NOBODY moves to [Spec;NegP] with both the object and the verb. The NMM then spreads on the whole clause. This is shown

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[56] Geraci (2005), commenting on his example (36), states that: «Neg-movement in (36) is replaced by wide spreading of the NMM. The same pattern has been observed for *wh*-movement...». Later in the same subsection, he says that «Neg-movement patterns like *wh*-movement both when it is overt and when it is covert: ... in the latter case broad spreading of the proper NMM is required» (Geraci assumes that movement may be either overt or covert).

in figure (154) where different LIS negative clauses are derived. Elements may be moved to or merged in [Spec;NegP], while the remainder of the clause raises to some higher projection. As will become clearer in the next lines, the extent and the composition of the chunk moved to [Spec;NegP] can vary in the two languages depending on the absence or presence of a lexical negative element and on the clause-final or in situ position of it.

154. Negation in LIS (with Spec-Head-Complement)
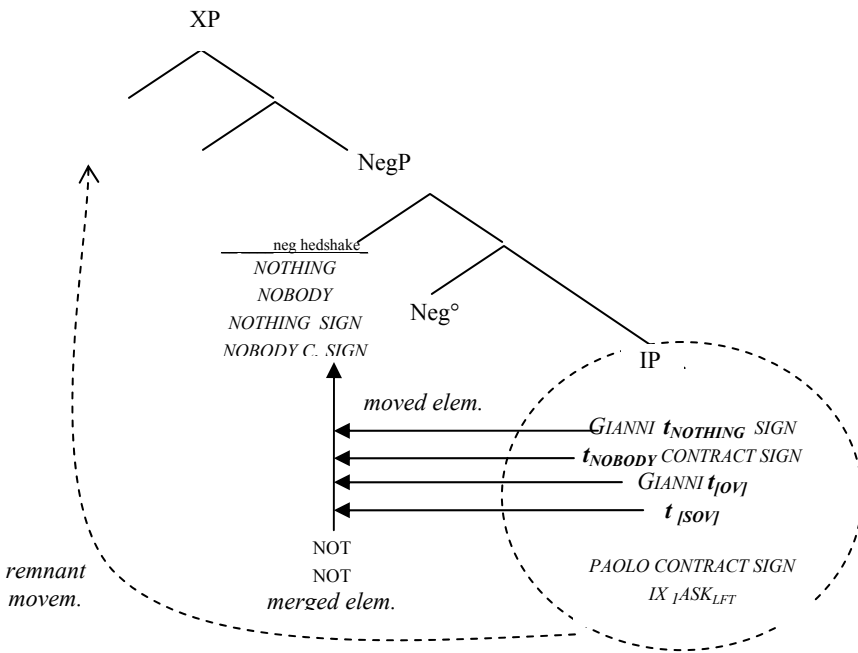
Taking this perspective, the sentences in which the negative element remains in situ and the NMM spreads over more than one element of the clause result from movement of a bigger portion of the clause to [Spec;NegP]. In LIS (152.b), the in situ negative element is an object and the OV complex raises, whereas in (153.b), the negative element is a subject, so that the whole SOV sentence raises to [Spec;NegP] in order for the negative element to check its Neg feature in compliance with the neg-criterion (Haegeman & Zanuttini 1991: 244; Haegeman 1995: 106) while still remaining in situ. In other words, sentences with a negative element in situ are treated just like all other negative sentences. Whatever

additional movement is required, this is not an ad-hoc solution for just some negative sentences. Movement, if it occurs, is always leftward and overt. In principle, raising to [Spec;NegP] (or merge there) and remnant movement occur always and the different surface structures result from the varying size of the moved constituent. In principle, there are three options:

- some element (e.g. a constituent containing the verb, or verb and object) moves to [Spec;NegP] and the remaining clause (i.e. subject and object, or just the subject) undergoes remnant movement to a higher position, as in (152.a), (153.a) and (152.b);
- the whole SOV clause moves to [Spec;NegP] and nothing undergoes remnant movement, as in (153.b); or
- a negative particle is merged in [Spec;NegP] and the complete clause undergoes movement to a higher position, as in (150) and (151).

Again, I would like to point out that similar analyses have been proposed for wh interrogative clauses, where the wh variable raises past the interrogative particle as part of a bigger chunk (see chapter 4). This parallelism may also have to do with the fact that in situ negative elements in LIS are only partially accepted (my informants prefer the clause-final position) just as in situ wh signs are more marked than clause-final wh-signs.

   Let us now turn to NGT. NGT examples (130.b) and (131.b) are repeated here for convenience as (155) and (156). Example (135.a) is repeated as (157).

155. $\overline{\text{IX}_1 \text{ SATISFIED GOOD IX}_1}^{\textbf{neg}}$ [NGT: repeated from (130.b)]
    'I'm not satisfied at all'

156. $\overline{\text{MIJN COLLEGA IX}_3 \text{ OPDRACHT BEGRIJPEN}}^{\textbf{neg}}$ [NGT: rep. from (131.b)]
    my   colleague ixtask   understand
    'My colleague does not understand the task'

157. $\overline{\text{AIRPLANE NOT-YET LAND}}^{\textbf{neg}}$ [NGT: rep. from (135.a)]
    'The airplane has not landed yet'

NGT behaves much like LIS but, having no negative sign NOT in [Spec;NegP] in (155) and (156), it always requires the raising of a part of the sentence (verb and possibly object) to [Spec;NegP]. The same can be assumed to occur with the NGT sign NOT-YET in (157), which remains in situ[57] and thus requires the raising of a bigger constituent, containing also the verb. As proposed for LIS, then, remnant movement occurs subsequently and brings the remaining portion of the NGT sentence above and to the left of NegP. Thus, we are once again dealing with some element varying in size (e.g. a constituent containing verb and, possibly, object or negative adverb) that raises to [Spec;NegP], and the remainder of the clause (i.e. the subject) that moves to a higher projection, as in LIS. Only the elements in [Spec;NegP] are marked by the negative NMM. This is shown in figure (158).

158. Negation in NGT (with Spec-Head-Complement)
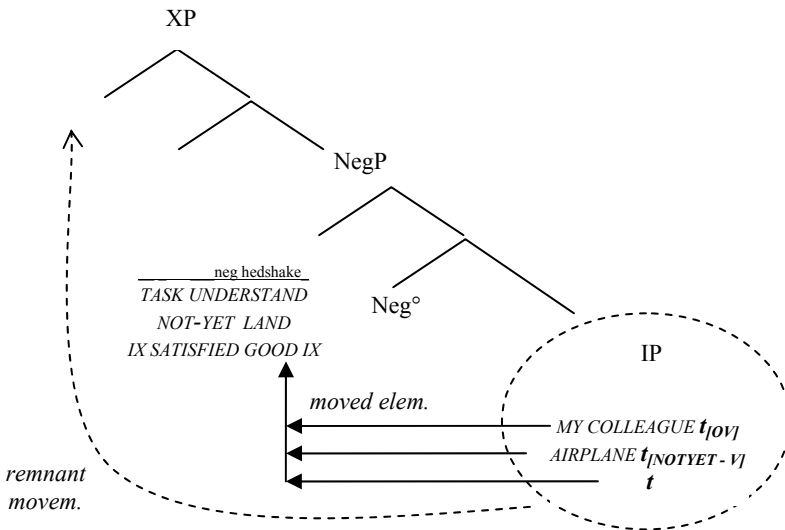
In particular, the difference between LIS (130.a)=(150) and NGT (130.b)=(155) is that the the whole clause raises to [Spec;NegP] in NGT,

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[57] As pointed out by Roland Pfau, the sign NOT-YET has an aspectual component, in addition to its negative meaning. This may well interact with its position in the clause. A finer-grained structure of NGT will shed light on this fact. However, here I am addressing only the issue of movement in relation to negative features.

whereas the LIS verb ASK raises above NegP together with the remainder of the clause, because [Spec;NegP] is occupied by NOT in LIS. Thus, in NGT (155), the negative NMM appears on the verb, while in LIS (150), the NMM is restricted to the clause-final sign NOT (as observed by Geraci). The derivations of LIS and NGT negative clauses can be represented together in figure (159), thus showing that the two languages are minimally different from each other.

159. Negation in LIS and NGT (with Spec-Head-Complement)
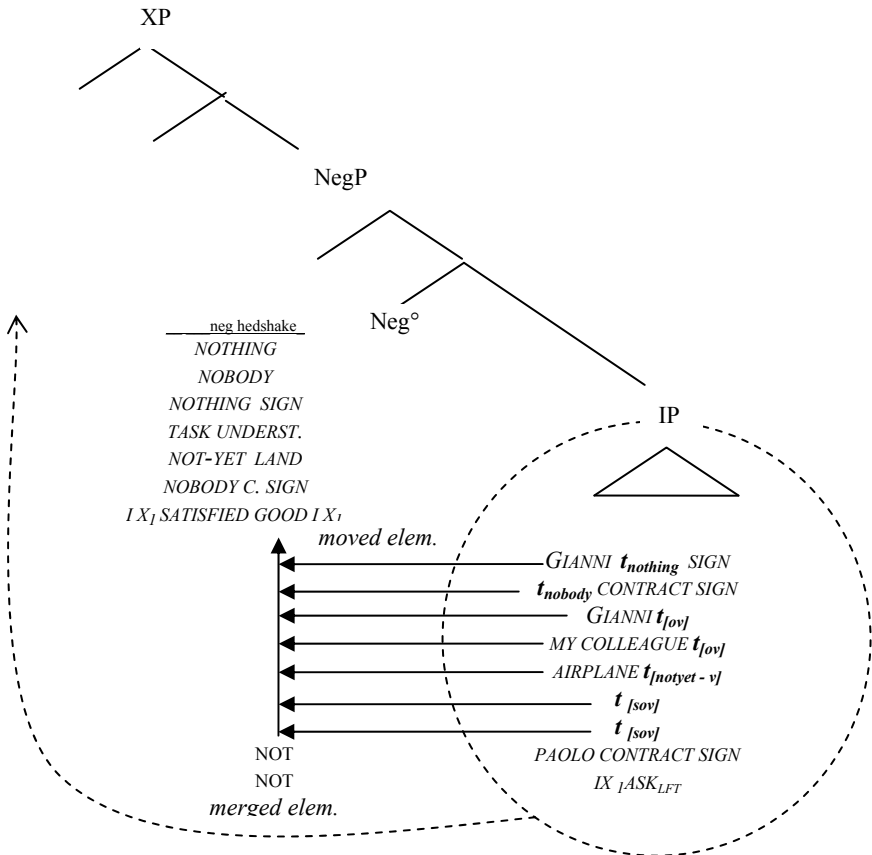
Of course, within such a model, the (remnant) leftward movement invoked here to bring part of the clause outside the negative NMM assigned in [Spec;NegP] must be motivated. In fact, according to this hypothesis, the remnant movement is not even always really "remnant",

in the sense that it occurs also when nothing else has moved (but LIS NOT has been merged, for instance). I will come back to this issue in §3.3. Notice also that NGT (135.b) cannot be accounted for under the present analysis, unless we assume that NGT NOT occupies a structural position different from the position of LIS NOT.

3.2.4 The behaviour of negative modals

This section discusses some properties of negative modal signs, focusing in particular on the scope relation that they have with the negation. I will compare this relation with the scope relation existing between the negation and other verbs, which require a standard negative construction. Starting from these considerations and sticking to the antisymmetric framework, I will then argue for a hierarchy of syntactic projections in the spirit of Cinque (1999, 2006).

Negative modal signs, such as those in (137)-(141), which encode both modality and negation at the same time, are attested in various sign languages, as already pointed out in §3.1.4. Pfau & Quer (2007), referring to van der Auwera (2001), observe that this is a well-known crosslinguistic pattern among languages in general: even spoken languages may encode modality and negation within a single word. Pfau & Quer propose to analyze the negative modal signs in LSC and DGS as modal forms incorporating a negative affix, possibly by cliticization, during their (rightward) movement from T° via Neg° to a position above Neg°. Movement of an element from Neg° to T° is suggested also by Wood (1999) for the ASL sign NEVER.

Notice that, in my opinion, some movement from Neg° to T° is implied also in Neidle et al.'s (2000) analysis of ASL. They state that modals have the same distribution as tense markers and that both occur in T° (Neidle et al. 2000:79f). They also assume that the lexical negation NOT is in Neg°, which also contains the negative features realized as a 'headshake' NMM that is able to spread over strings of signs. Given that the modal precedes the negation, falling outside the headshake NMM that affects NOT and the lexical verb that follows, they argue for a TP > NegP...>VP hierarchy of projections in the structure. In their view, the negative headshake NMM spreads from Neg° onto NOT and on the following verb without affecting the modal, which occupies T°. However, they observe that the modal may contract with the negation (e.g. SHOULD^NOT), in which case the modal does bear the negative NMM. In

light of these observations, two accounts are possible, in my opinion. The negative modal is merged in Neg° (just like NOT, as it bears negative features) and raises to T° (as also other modals sit in T°). Alternatively, the modal is merged in T° and the negative affix in Neg°, and the headshake NMM raises to T° to join the modal. In either case, something must move from Neg° up to T°. Here, I will discuss some properties of NGT and LIS negative modals, which do not depend on the issue of movement, but rather represent a previous step of analysis. For this reason, the discussion will rest on empirical grounds. The basic question is: why do only few verbs, and frequently the same across languages, have the peculiarity of lacking a standard negative construction? In principle, if negative incorporation is a syntactic phenomenon available to the language, it could affect all verbs in the same way.

In §3.1.5, LIS and NGT were shown to employ specific negative modal signs for CAN^NEG, MUST^NEG, ABLE^NEG, and DISLIKE/WANT^NEG, while both languages use their standard negation strategy for the modal of obligation: OBLIGATION + NOT in LIS and HAVE-TO + NMM in NGT. These two exceptional cases in (140) and (141), are repeated here as (160) and (161):

160. (IX$_2$) $_2$GO$_3$ OBLIGATION NOT   [LIS]
     'You don't have to go there / you need not go there'

$\overline{\qquad\text{neg}\qquad}$
161. (IX$_2$) HAVE-TO   [NGT]
     'You don't have to / you need not'

$\overline{\qquad\text{neg}\qquad}$
Crucially, the combinations OBLIGATION NOT and HAVE-TO, on the one hand, and the sign MUST^NEG, on the other hand, entail different scope relations with the negation. OBLIGATION NOT and HAVE-TO+NMM entail "negation of an obligation/necessity" (it is not necessarily the case that you must…), whereas MUST^NEG entails "necessity of negation" (it must necessarily be the case that you do not…). Put it in other words, the former negate (the presence of) a restriction: *take obligation and negate it*. In contrast, the latter encodes the presence of a different (opposite) restriction: *restriction to do*… vs. *restriction not to do*….

A behaviour similar to that of MUST^NEG is observed in the signs for 'do not want': LIS DISLIKE/LIKE^NEG and NGT WANT^NEG. Despite their translations ('wil-niet', 'non-volere', 'not-want'…), they do not negate a

desire, but rather express an opposite desire[58]. These signs do not simply negate the presence of one's wish (thus possibly implying a neutral attitude: neither like nor hate), but they express the wish "not to have (to do with)". This is also visible in the "refusal" facial expression which accompanies these signs and, for this reason, I have chosen the gloss DISLIKE for the LIS sign as an alternative to LIKE^NEG. As for its NGT counterpart, I have maintained the gloss WANT^NEG (*wil-niet* on www.kegg.nl/egg_gebaren.php). Taken together, these facts imply that MUST^NEG, DISLIKE/LIKE^NEG, and WANT^NEG encode information that is partially different from that of their alleged positive counterparts and that they have a different scope relation with the negation than other verbs do. This is not a peculiarity of sign languages since, for instance, a similar observation can be made for the Latin verb *nolo* (negative of *volo* 'I want') the use of which went far beyond the function of negating the property of the positive modal (cf. e.g. the negative imperative *noli me tangere* 'don't touch me!').

At this point, it is worth noting that some languages display ambiguities in that they only use the standard negation and do not resort to specific forms. Take the Italian negative modal form *non devi* in (162) and (163), for instance: the sequence *non devi* conveys "obligation not to do" in the first example and "non-obligation to do" in the second one.

162. Non devi parlare durante la riunione ≈ Guai se parli...   [Ital.]
     'You must not speak during the meeting' (you better not speak!)

163. Non devi parlare durante la riunione, ma se vuoi puoi   [Ital.]
     'You don't have to speak during the meeting, but if you like you can/are allowed to'

Disambiguation is only possible either from to the context, as in the above examples, by means of intonation (stress on the modal *devi* and possibly a prosodic break between it and the negation), or with constructions like *non è che devi* 'it is not (the case) that you *"devi"* '

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[58] This proves, once again, the importance (and the risk) of glossing signs. Glosses are often, albeit not always, based on the rough translations that signs have in spoken languages. However, translations may not cover the meaning exactly, and glosses based on wrong or incomplete translations may be misleading for the analysis.

which force the reading (163). In conclusion, in contrast to languages like Italian, NGT and LIS negative modals seem to take into account the fact that negation-of-X and opposite-of-X are not necessarily the same thing (although the latter entails the former).

As for other modals, negating ability amounts automatically to stating inability and negating possibility amounts to stating impossibility. Consequently, choosing one form over the other should not lead to any major differences in the modal meaning, although in my opinion, impossibility has some more semantic content than just negating possibility (impossible implies that it is *necessarily* not possible[59], and negative modals such as *non puoi* 'you may not' may take over other deontic functions such as *non devi* 'you mustn't').

All in all, it appears that LIS and NGT use specific negative modals to encode some more semantic content than just negating the properties of a modal. In my opinion, this additional semantic import justifies the assumption that such signs are included in the lexicon directly with their own specific form and meaning, as distinct items or "words". Negation is an additional property of these signs which stems from their semantics (since "opposite of x" entails "negating x", even though "negating x" does not automatically entail the "opposite of x"[60]). This also implies that the negative features of such signs are part of their lexical entry and, for this reason, they are an inherent part of the sign. The standard, "true" negation is compositional, in that it takes a positive verb and adds some negative features at the structural level[61] through a syntactic operation. In contrast, the negativity of specific negative modal signs derives from their semantic content and is thus part of it. In this perspective, thus, these elements should not be considered incorporating signs in the sense that they incorporate some negative affix syntactically, but, rather, they should be considered as signs which incorporate negative features as part of their basic form. In other words, their negative feature is "built-in" in

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[59] This intuitively relates to the well-known equivalence of modal logic $\neg\Diamond P = \Box\neg P$.

[60] Interestingly, Morgan (2006:117) states that some Japanese Sign Language signs constitute opposites and **can be taken as** negative: «JSL, like most sign languages, possesses numerous pairs of signs that are opposites, both semantically and, significantly, formationally […] Such pairs can often reasonably be considered affirmative and negative pairs».

[61] In "I do not go", it is not the verb "go" itself which is negative, but the sentence, the combination *(do)+not+go*, i.e. the syntactic structure which underlies it and puts the verb in relation with the negation.

their lexical form: in addition to the modal content, they **carry** negative features, as usual lexical negators do[62].

Such negative features must be associated with some head, as proposed for negative particles. Therefore, in addition to occupying a modal projection, it is likely that these negative modals move to (or are merged in) some negative projection. At this point, the question arises whether they occupy Neg° or [Spec;NegP]. In my opinion, there are good reasons to assume that these negative modals are located in [Spec;NegP] at some point during the derivation. This may occur in different ways, in principle. First, the synthetic negative modals could either be generated below NegP and raised to NegP or be merged in [Spec;NegP] and raised to a higher modal projection ModP. Secondly, various types of movement may be involved. The negative modal may raise from spec to spec (as subjects are commonly assumed to raise from [Spec;VP] to [Spec;IP/AgrP]). Alternatively, the modal may occupy the specifier of a maximal projection and that maximal projection raises into a higher specifier (e.g. ModP raises to [Spec;NegP] or NegP raises to a higher [Spec;ModP]). As will become clear later, the modal may also occupy [Spec;NegP] even though being a head. It could be the head of a maximal projection which is either raised to or merged in [Spec;NegP].

At this point, I cannot be more precise about this issue. The position of NegP with respect to ModP is discussed later. In any case, the assumption that negative modals occupy [Spec;NegP] accounts without further stipulations for the fact that LIS negative modals do not co-occur with the lexical negation NOT, which Geraci argues convincingly to occupy [Spec;NegP]. Moreover, given that specific negative modal signs carry negative features as do negations and negative arguments (rather than just being positive modals combined syntactically with a negation), it seems more natural to assume that they occupy the same position occupied by these negative elements, namely [Spec;NegP].

Alternatively, one can assume that the negative modal sits in Neg° at some point of the derivation. Again two options exist, in principle. Either the synthetic negative modals are generated in a Mod° below Neg° and raise to Neg° or they are merged in Neg° and raise to a higher Mod°. This requires assuming head movement of the modal from or to Neg° and a

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[62] From this point of view, I would rather call these synthetic signs *modal negators*, instead of negative modals.

double-fill filter preventing material in [Spec;NegP][63]. Assuming head movement of the negative modal would be in line with Pfau & Quer's (2007) account for DGS and LSC negative modals. However, in the present analysis, there are some difficulties with head movement. First, it requires an additional stipulation (double-fill filter) to account for the complementary distribution of negative modals and NOT in LIS. Second, in Pfau & Quer (2007), head movement of the modal to Neg° is necessary to combine the modal with the negative affix 'headshake', which they take to be encoded in Neg°. In contrast, the present analysis relies on the assumption that the negative headshake is a NMM assigned under spec-head agreement to the constituent(s) sitting in [Spec;NegP] (as Pfau (2006a) and Aboh & Pfau (2011) propose for interrogative NMMs). Third, in Pfau & Quer (2007), head movement of the modal is in line with head movement of the verb. Here, however, XP movement of the verb seems to be more likely both in the case of negation (see §3.2.3) and in the case of aspect markers and modals (see §3.2.2), even though this hypothesis must be strengthened with further investigations.

Fourth, in Pfau & Quer's (2007) analysis of LSC and DGS, head movement of the modal is related to their cliticization approach. In their view, head movement brings the modal to a F° head above NegP, a head to which [Spec;NegP] subsequently cliticizes. This accounts for the special form of negative modal signs of DGS and LSC. In other words, if I understand correctly, Pfau & Quer's analysis relies on a "compositional vision" of negative modals, of which the negative forms result from some syntactic operation. However, if LIS and NGT specific negative modals were the result of some syntactic operation, it would be unclear why this operation is not productive, that is, why it should affect only a closed class of elements. Interestingly, Pfau & Quer (2007) suggest a parallelism

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[63] Geraci (2005) reports a negative element in [Spec;NegP] to co-occur marginally with a negative modal sign and takes this as evidence for head movement of the negative modal to Neg°:

1. $^{??}$SMOKE CANNOT NOBODY   (LIS, Geraci 2005:ex. 28)

However, as he notices, this sentence has a double-negation reading. This is a reading different from that of other negations analyzed here, where negative elements in [Spec;NegP] co-occur with an empty Neg° containing only [+neg] features. In my opinion, the double-negation reading resembles cases where negative features are encoded twice (there is *nobody* such that s/he does *not*...). Clearly such cases require deeper investigation. Interestingly, however, Geraci assumes that in this case «CANNOT enters the lexicon with a negative feature».

between cliticization in LSC and DGS and cliticization of the Italian negative particle *non* ('not'). Crucially, however, the Italian negation *non* combines with lexical verbs, as well as with modals. My analysis, in contrast, relies on the assumption that specific negative modals (of LIS and NGT) enter the lexicon with their negative features and with their specific form because these are inherent to their specific additional semantic content[64].

In conclusion, not only does head movement seem less motivated in the case of LIS and NGT, but the semantic properties of LIS and NGT specific negative modal forms make it more likely for them to occupy [Spec;NegP]. With respect to cliticization, notice that it is relevant that Pfau & Quer's (2007) approach is based on the fact that LSC negative modals have the same 1-handshape (and possibly the same movement) as the negative marker and that DGS negative modals display an alpha-shaped movement of the hand. These facts suggest indeed the cliticization of some negative feature (a negative handshape or a negative movement) to the modals. In contrast, the LIS and NGT negative modals that I have observed do not only constitute a closed class of elements, but also do not even display a consistent pattern of cliticization: each negative modal has its own lexical form, although **some** of these are reminiscent of the lexical negation[65]. This is also the reason why I do not divide negative modals into cliticized and suppletive forms (as was already discussed in §3.1.4).

The idea that negative modals occupy [Spec,NegP] is not incompatible with them being heads. Given that specifiers host maximal projections, [Spec;NegP] can host an XP the head X° of which is occupied by the modal. In fact, this hypothesis is not very different from the usual assumption that subjects are N° heads inside an NP/DP which in turn occupies [Spec;VP] (or [Spec;IP]). A further hypothesis to verify is that this more complex structure of the negative modal may reflect its more complex semantic content.

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[64] This does not exclude the possibility that the lexical forms are compounded (as, for instance English *dis-like* or *im-possible*), but suggests that compounding takes place before the merger of the lexical element in the syntactic structure of the clause.
[65] For example, an alpha movement occurs in the LIS and NGT signs for CAN^NEG, but the signs MUST^NEG/MAY^NEG have an outward movement and the 1-handshape of the negative marker (instead of an alpha movement). The signs for WANT^NEG/DISLIKE have yet other properties.

The exact position of the negative projection, however, is not easily determined because sentences may contain more than one negative projection, as already pointed out (Zanuttini 1997; Poletto 2008). Given the ordering **V-Mod**(*oblig*)**-Neg** of (140), and successive leftward movements, the projections should be ordered as Neg… > Mod… > V. This is represented in figure (164). The verb moves past the root modal of obligation, the LIS lexical negator is merged in [Spec;NegP], and then ModP, containing modal and verb, moves further up.

164. The hierarchy of projections Neg>Mod$_{root}$>V (with LIS negator
     NOT merged in [Spec;NegP])
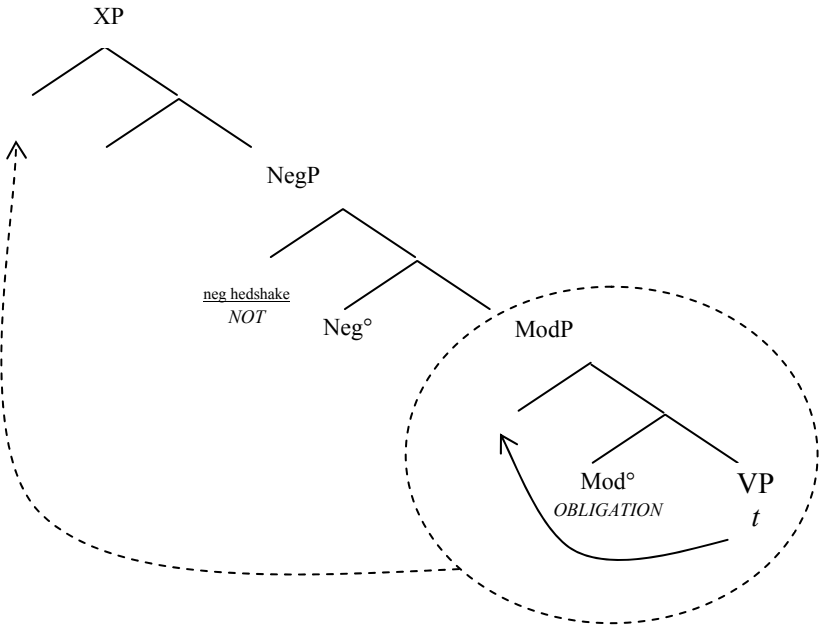
It is not clear, at this point, whether two LIS negations can co-occur in one clause. However, the following sentence suggests that two negative modal signs may be able to co-occur in LIS. This sentence (165) has been judged as infrequent, but not as "strange" or ungrammatical by my informants.

165. IX SWIM ABLE^NEG CAN^NEG   [LIS]
    'It is impossible that s/he is not able'
    'S/he may not be not able'

This sentence suggests that there may be two distinct positions for negative signs[66]. Taking into account the present leftward movement analysis, the ordering **V-NegMod-NegMod** of (165) would reflect the opposite order in the hierarchy of projections Neg_{can}>...Neg_{able}>...V. The

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[66] I thank Roland Pfau and Anne Baker for pointing out that this co-occurrence of two distinct negative modals may be the result of a biclausal structure ('it is impossible that he is unable to...') and that the first part of this sentence may be topicalized (roughly *'he being unable to swim,* is impossible'). Such an analysis is certainly possible, due to the lack of an overt copula and to the fact that the same sign may act as an adjective ('possible') or a modal marker ('can'). Hopefully, further research on NMMs will help to disambiguate the structure. Similar phenomena are also attested in spoken languages.

However, here I am referring to the possiblity that LIS and NGT have a full-fledged IP domain allowing for two negations in one and the same monoclausal structure as, for instance, Italian *non lo posso non considerare* 'it is impossible for me not to consider it' (lit. 'I it-cannot not to consider it'). According to Cinque (2006b), clitic climbing is a test to show that a monoclausal structure combines a lexical verb with a number of modal and aspectual verbs. Thus, comparing Italian sentences (1.a) and (1.b), which are both grammatical according to my judgement as a native speaker:

1.
   a.   Non posso non considerarlo un complimento/insulto
        Lit. I cannot not consider it (as) a compliment/insult

   b.   Non lo posso non considerare un complimento/insulto
        Lit. I it-cannot not consider (as) a compliment/insult
        'I cannot help considering it as a compliment/insult – It is impossible for me not to consider it as…'

it turns out that sentence (1.b) is monoclausal, given that the clitic *lo* ('it') has climbed near to the inflected modal *posso* ('can'). The presence of two negations *non* ('not') in this structure would thus mean that Italian allows for two negations in the same monoclausal structure. I try to verify whether such a complex structure can be explained in principle with a Spec-Head-Compl framework even in an allegedly head-final language such as LIS (even though the existence of clitic climbing in LIS is not investigated here). This might be, in principle, at the base of sentences like (165). In particular, the study of NMM spreading could shed light on this issue.

order also suggests indirectly a hierarchy of modals Mod_{can} > Mod_{able} > Verb, because both negative modals must check their modal features, in addition to the negative features. Thus, it matches Cinque's (1999) hierarchy Mod_{aleth}...> Mod_{root} >... V, with a higher "zone" for alethic modals such as "possibility/necessity", and a lower area for root modals expressing "ability/obligation/volition". Along the same lines, the ordering **V-Mod**(*oblig*)**-Neg** in (140) conforms to the hierarchy Neg>Mod_{root}>V.

Taken together, these examples would thus suggest at least one low negative projection which separates the lower position of root modals from the higher position of (negative) alethic modals [67], that is: Mod_{aleth}>...Neg>...Mod_{root}>...V. In contrast, the position of the higher negative projection (if any) cannot be determined on the basis of these data. If the co-occurrence of two distinct modal and negative projections within one monoclausal structure is ruled out, we are left with the hierarchies **Mod > Asp > V** and **Neg > Mod > V** anyway.

At this point, the issue remains of how specific negative modals come to be in [Spec;NegP]. Given their scope relation (Mod>Neg), it is natural to hypothesize that they target a modal projection that is higher than NegP. I am thus led to exclude the possibility that they raise from ModP to NegP. However, aside from these considerations, I have not managed to come to a conclusive hypothesis because the conclusion depends on different factors, in principle. I will list them briefly. First, the negative modal may either raise from spec to spec (e.g. from [Spec;NegP] to [Spec;ModP]) or through raising of the maximal projection in the specifier of which it sits (e.g. whole NegP to [Spec;ModP]). Second, the negative modal may be merged in [Spec;NegP] and raise to [Spec;ModP], or it may be generated somewhere below NegP, raise to [Spec;NegP], and proceed further up to [Spec;ModP]. Depending on the hypotheses, different remnant movements are required to ensure that the negative

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[67] According to Cinque (2006), this is partially confirmed also in a head-final language such as Turkish:
1. oku - ya - ma - yabil - ir - im   [Kornfilt 1997: 375]
    vb - mod - neg - mod - tns- agr
    'I may be unable to read / It is possible that I shall not be able to read'
where the negative affix takes scope over the root modal for ability '-ya-' but not over the higher alethic modal suffix for possibility '-yabil-'. Differently from Turkish, however, LIS agreement is on the left as in head-initial languages, directly attached to the verb and detached from modal/aspectual markers.

modal is stranded clause-finally. Very tentatively, I will assume that negative modals are merged in [Spec;NegP] (just like the LIS negative particle NOT) and raise to a higher [Spec;ModP], followed by one remnant movement which brings the rest of the clause to their left. There are two reasons for this assumption. First, this hypothesis requires only one remnant movement and is thus the most simple derivation among those proposed here. Second, assuming that specific negative modals are merged in [Spec;NegP] as are lexical negations (e.g. NOT) would be in line with the previous claim that negative modals share indeed important features with negations, crucially, that both carry negative features as part of their lexical entry.

3.3 Conclusions

This section summarizes my findings on the linear order and the properties of LIS and NGT modals, aspect markers, and negative elements, and also recapitulates the derivation that I have proposed for them following an antisymmetric model. It then suggests some parallelisms that can be observed between the DP and the IP of each language. It also provides some general conclusions and lists some questions which are left open for further investigation.

LIS and NGT orders of signs **V-Neg**ation, **V-Perf**ect, **V-Mod**al and, more generally, **V-Asp-Mod** are the opposite of what is commonly observed in head-initial languages. Yet, looking at more abstract features such as verbal inflection, there is an important similarity: subject agreement is to the left of modals and aspectual markers in these sign languages, as it is in head-initial spoken languages like Italian. In LIS and NGT, subject agreement appears on the lexical verb, which is thus argued to raise leftward, just as finite modals and auxiliaries are generally claimed to do in head-initial languages. Once independent evidence for leftward movement has been provided, the order of elements within the IP domain of LIS and NGT is derived through successive rolling-up leftward raising movements.

Thus, although, at first sight the order of aspectual markers, modals, and negation in LIS and NGT seems to suggest a head-final structure for the analysis of their IP domain, an antisymmetric structure with leftward raising(s) is able to derive the order of signs without additional

stipulations, relating it to the position of subject agreement which appears to the left of other elements and attached to the lexical verb.

The exact position of agreement is not easily determined, but it is sufficient to assume that it is as high in LIS and NGT as in other languages, such as Italian (or even Turkish). Starting from Cinque's (1999, 2006) universal hierarchy **Mod>…Asp$_{perf}$>…Asp$_{dur/celerI}$>…V** and matching Baker's (1985) Mirror Principle, the verb raises to the left and triggers successive "inverting" leftward movements which yield the observed postverbal order of elements **V-Cel**erative/**Dur**ative-**Perf** and, in general, **V-Asp-Mod**. In NGT, this derivation works only partially because, even though the perfective marker is postverbal, the modals appear in both **V-Mod** and **Mod-V** order (as well as double-modal constructions which, according to van den Bedem (2006) may be an instance of focus-doubling). While such a variation within the same language suggests once more that a head-final hypothesis is not able *per se* to explain the position of NGT elements (in addition to the left position of subject agreement), the possibility of having a preverbal modal in this language strengthens the hypothesis of a modal projection above and to the left of aspect and verb even in a sign language where postverbal modals are attested. The variation may be the result of a general property of NGT, namely of allowing for piedpiping to a different extent than LIS does. Alternatively, it may be related to the fact that NGT, in contrast to LIS, allows double person agreement of the verb. As for the behaviour of agreement, further investigation is required about its position(s) in the structure of these sign languages, but note that the difficulty to locate the exact position of subject agreement has been observed across a wide range of so-called head-initial and head-final languages (Cinque 1999, 2006; Julien 2002). This difficulty then does not depend on the antisymmetric or nonantisymmetric nature of the deep structure. In contrast, as said above, determining the exact height of subject agreement in the structure is not even necessary under an antisymmetric analysis. The LIS verb raises more consistently and higher in the IP than the NGT verb does. This is reminiscent of a similar phenomenon observed in the DP of these languages. As described in chapter 2, the LIS noun raises higher and more consistently within the DP than the NGT one does.

In this perspective, these sign languages differ from head-initial languages and from each other only in the extent of their (leftward)

raising and in which element carries agreement. This minimal difference is an argument in favour of a uniformity of deep structures across languages, which is an interesting candidate for a language universal for Generative Grammar. Leftward raising within IP also goes hand-in-hand with leftward-raising phenomena observed in the left periphery of these sign languages (such as topicalization, see the discussion of the CP domain in chapter 4), and thus meets requirements of uniformity of structure within one and the same language (the structure of which must be either consistently Spec-Head-Compl or, at least, consistently Compl-Head-Spec, as seen in chapter 1).

Leftward movement can also be applied to the distribution of negative signs and nonmanual markers. Again, the derivation in LIS and NGT results from successive raising(s), always overt, to [Spec;NegP] or to a position above it, without the need for two distinct sorts of movement: overt vs. covert. Indeed, from this point of view, covert movement is a kind of optical illusion (or syntactic illusion) generated by the fact that the relevant element raises together with "surrounding" elements, possibly followed by remnant (still leftward) movement. In other words, covert movement, rather than being a movement which happens only at Logical Form, can be understood as the overt movement of an element, "covered up" by other elements which raise together with it and make its position seem unchanged (as is often the case in physics, it is the observational frame of reference that allows one to detect movement[68]). Under the analysis proposed here, however, the distribution and the extent of the NMM still reveal the size of the constituent(s) raised to [Spec;NegP] together with the negative element. The distribution and the extent of the NMM also make it possible to relate the spreading of the NMM to the presence and the (in situ) position of the negative sign (without resorting to two different types of movement). When [Spec;NegP] is filled by the LIS negative particle NOT or by another negative element, the NMM accompanies only this sign. When the negative element remains in situ, or there is no lexical negation as in NGT, the spreading of the NMM signals that a bigger constituent was forced to raise and fill that specifier. The fact that a negative quantifier moves to NegP as part of a bigger chunk parallels similar proposals for

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[68] For instance, one person in a train may be immobile with respect to his/her seat or the window near him/her, but may move together with the train with respect to objects which are outside the train.

wh elements moving to InterP within a bigger constituent, in both spoken and sign languages (such proposals are exploited in chapter 4 in order to derive wh interrogative clauses in LIS and NGT).

The special behaviour of some negative modal signs, which have a specific, dedicated negative form instead of the standard negation, is discussed in the light of their semantic content, which is partially different from just negating their alleged positive counterparts. These special negative modal forms also entail a scope relation with the negation, different from the scope relation of other verbs. The clearest point in case is that of "refusal" modals DISLIKE/WANT^NEG and negative restrictions MUST^NEG/CAN^NEG in comparison to the simple negation of a restriction (HAVE)OBLIGATION+NOT or HAVE-TO + negative NMM. In this case, LIS and NGT make a distinction between "negating X", with standard negation (which takes a positive form and inserts it in a negative-marked structure), and "stating the opposite of X", with a specific negative form (where negation is only a byproduct of opposition). In doing so, LIS and NGT appear more precise than languages in which the use of only standard negation may lead to ambiguities, such as Italian *non devi* 'you mustn't/don't have to'. Other modals, like CAN^NEG or (BE)ABLE^NEG, seem to blur this distinction and indeed, no major differences arise between the meaning of such dedicated forms and that of standard negative forms such as Italian *non puoi* 'you cannot/may not' or *non sai* 'you are not able to'[69]. In this analysis, I do not assume any distinction between cliticized negative modal forms and suppletive negative modal forms. On the basis of their semantics, I argue that dedicated negative modal signs behave as lexical negations and occupy [Spec;NegP] (the same position occupied by the LIS lexical negator NOT). In principle, however, this does not exclude that these negative modals are heads of an XP hosted by [Spec;NegP]. As for the ordering of projections, in the light of the leftward movements proposed here, the LIS order **V-Mod(*oblig*)-Neg** suggests a hierarchy: **Neg…> Mod…> V**.

However, the analysis leaves at least three issues open. The first one concerns the position of NegP; the second one concerns the position of the landing site for the remnant movement which strands the negation

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[69] As far as opposite and negative forms are (almost) equivalent, two different strategies may co-occur in the same language. This also holds for lexical verbs. For instance, in many (if not all) spoken languages, 'remember'≈'do not forget' and 'forget'≈'do not remember'.

clause-finally; the third question is whether LIS and NGT allow for two negations in one clausal structure or require a biclausal structure. The position of the higher NegP may well correspond to Geraci's (2005) negation, which he assumes to be above IP; alternatively, NegP may be located lower in the structure. I have no data to clarify this and further research is necessary. The landing site for remnant movement depends on the position of the negation and it must be related to specific features in order to avoid an ad-hoc proliferation of projections. However, remnant movement requires just one higher additional projection. At this point, if NegP is above IP (as Geraci suggests), a good candidate for a next higher projection is FinP, while if NegP were within IP (below subject agreement), good candidates for landing sites could be TP[70] as well as some aspectual or modal projection. If the co-occurrence of two negative modals in one monoclausal structure is confirmed, there would be a lower NegP "trapped" between lower, root modals (for obligation, volition, ability) and higher, alethic modals (for "pure possibility"), which are lower than TP, according to Cinque. A remnant movement past the lower negation could then target the next higher aspectual or modal projection. In all these cases, no special features are needed to justify the landing sites, since the possible projections involved are largely independently attested in other languages. On this point, Geraci (2005: note 20) observes that in negative sentences as GIANNI NOTHING SIGN, the subject is marked with raised eyebrows. Since this NMM is employed with topicalized constitutents, it may indicate that remnnant movement brings the subject even to some topic projection, at least in some sentences. This implies that remnant movement might not always target the same landing site and may have different motivations, according to the context. Further research is necessary, however, in order to establish in detail which projections are actually involved.

The present analysis exploits the overt synthetic person inflection, especially subject agreement of verbs to determine the position of inflections with respect to modals and aspect and to argue for (leftward) verb raising. The presence of plain verbs in LIS and NGT does not *per se* contradict this proposal, because the fact that some verbs display no overt agreement does not mean that they have no agreement at all. This parallels well-known observations about other agreement phenomena

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[70] With respect to TP, I am assuming that it is below subject agreement.

such as plural marking, for instance. The fact that some nouns retain the same form in both plural and singular does not prevent them from agreeing with other elements. For instance, in Italian *la città* ('the city') and *le città* ('the-PL cities', lit. 'the-PL city'), the invariable, but plural, noun *città* agrees with the plural article *le* even though such agreement is not expressed overtly. Were the noun not plural, the sequence would be ungrammatical. As already stated, however, the analytic inflection of verbs through indexes and/or auxiliaries must still be taken into account to fully verify the hypotheses put forward here and to possibly explain some differences existing between LIS and NGT order of elements.

A final question is whether the raisings are head movements or, rather, movements of maximal projections along the lines of Cinque (2008b). While head movement seems possible and maybe intuitively plausible in some instances, XP movement seems compatible with all the raisings involved, including sentences with topicalized verb and possibly inflected modal[71]. If confirmed, this latter hypothesis would also account for some similarities between the IP and DP domain of each of the two languages (the DPs were analyzed in chapter 2 with successive XP movements along the lines of Cinque (2000, 2005a)). More insight could derive from the ordering and the behaviour of other aspectual markers, as well as from the position of the object and object agreement, which have not been investigated here.

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[71] Note that VP movement is assumed also for ASL (Aarons et al. 1995; Wood 1999), albeit under certain conditions, different from those discussed here. Also Neidle et al. (2000:178) suggest that XP movement of the aspect phrase containing the verb may occur in some ASL sentences.

Chapter 4: The structure of the Left Periphery – Sentence types and topicalization

Sign languages do not only have their own rules to build plain (declarative or negative) sentences, but they also employ specific constructions to mark topicalizations, imperative and interrogative clauses. With respect to interrogative clauses, they often distinguish wh questions from polar (yes/no) questions. The presence of these phenomena, well known in spoken languages[72], suggests that sign languages have a full-fledged structure just as spoken languages do. In particular, they demonstrate that sign languages, too, have a left periphery, as will be argued in the following sections. As it happens in spoken languages, these constructions often involve changes in the word order of sign language sentences and the use of specific lexical markers. Yet, nonmanual markers also play an important role in marking these constructions.

In the following sections, the order of elements in the LIS and NGT left periphery will be compared, taking into account also the distribution of nonmanual markers. Although the two languages often pattern alike or in a similar way, crosslinguistic variation will be observed. This is expected because sign languages, being natural languages, share a similar basic structure, but also display parametric variation. In the first part of the chapter (§4.1), I will present data concerning topicalizations, imperative clauses, and different types of interrogative clauses. In the second part (§4.2), I will propose an account for these phenomena within an antisymmetric framework, extending to sign languages (and refining) some proposals put forward for spoken languages. General conclusions follow in §4.3.

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[72] In spoken languages as Italian, Dutch or English, it may appear that wh questions are not marked differently from polar questions. More precisely, in these languages, wh questions (*Quando viene Marco?*, *Wanneer komt Marco?*, *When does Marco come?*) may appear to have just the form of a polar question (*Viene Marco?*, *Komt Marco?*, *Does Marco come?*) to which a wh element is added. However, there are spoken languages that distinguish polar from wh questions by using distinct markers for the two constructions. For example, polar vs. wh questions are indicated in the Copala Trique language by the sentence-final particle *nah* in yes/no interrogative clauses and the sentence-final particle *ga* in wh interrogative clauses (see Bradley & Hollenbach 1992).

4.1 Word order with respect to sentence type and topicalization

This first part of the chapter describes the word order encountered in topicalizations and in different types of sentence, such as imperative clauses, polar interrogative clauses, and wh interrogative clauses. It also describes both the lexical and the nonmanual markers that commonly accompany these constructions. It focuses on LIS data and NGT data proceeding both from other authors' works and from informants' grammaticality judgements. However, data from other sign languages and also from some less-known spoken languages are occasionally included when they are useful for the comparison to support the analysis or to shed some light on the similarities between the spoken, oral modality and the visual, signed one. The first part is organized as follows: §4.1.1 describes imperative clauses, §4.1.2 describes polar questions, §4.1.3 deals with wh questions, and §4.1.4 briefly describes alternative (content) questions. §4.1.5 presents different kinds of topicalization and describes the way they interact with imperative and interrogative clauses. §4.1.6 summarizes the data.

4.1.1 Imperatives

This section describes the imperative construction in LIS and NGT and compares them with imperative clauses of Indo Pakistani Sign Language (IPSL). It also introduces the idea of clause-typing morphemes, which underlies much of the discussion in the second part of the chapter. In sign languages, imperative clauses are usually indicated by nonmanual markers and often display a quicker and more tense movement of the signs than plain declarative sentences do. This is also the case in LIS and NGT: the imperative nonmanual marker of LIS is "furrowed brows and eyes wide open" (it. *sopracciglia corrugate e occhi sbarrati*, see Franchi 1987:168); the imperative nonmanual marker of NGT is "slight forward lean, squinted eyes" and a "head nod" (see Pfau 2006a:3). In both languages, imperative clauses are also marked manually by quicker and more tense signing. See, for instance LIS (166.a) and NGT (166.b), where imperative features marking is indicated with 'imp'. In other words, although 'imp' is glossed like a NMM here, 'imp' does not only represent the nonmanual modification, but also the manual imperative

features of movement. This 'imp' marker must not be confused with the lexical imperative marker glossed IMP (see further in this section).

166.
      <u>imp.</u>
  a. STUDY   [LIS]

      <u>imp.</u>
  b. STUDY   [NGT]
      'Study!'

These imperative features are not restricted to the verb, but affect the whole sentence as in examples (167.a) and (167.b).

167.
            <u>imp.</u>
  a. (IX$_2$) BOOK $_2$GIVE$_3$ [LIS]
      'Give him/her the book!'

          <u>imp.</u>
  b. IX$_2$ BOOK $_2$GIVE$_3$ [NGT: adapted from Pfau 2006a:3]
      'Hey, give him/her the book!'

The two languages, thus, pattern alike: only nonlexical marking signals the imperative and, apparently, no special changes in the order of signs are observed. This is reminiscent of the behaviour of some spoken languages where only intonation distinguishes the imperative mood from the indicative mood, the verb bearing no special markers and the word order being unchanged (for instance, compare Italian *leggi questo libro* 'you read this book' with *leggi questo libro!* 'read this book!')[73]. On the other hand, in some sign languages, for instance, in IPSL, a sentence-final lexical marker glossed as IMP can appear in imperatives, as shown in (168).

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[73] I thank Guglielmo Cinque for drawing my attention to the fact that imperative verbs of many spoken languages often have a reduced morphology, with only root+thematic vowel, with respect to indicative forms. Compare Spanish 2.SG indicative *habla-s* ('you speak') with 2.SG.imperative *habla!* ('speak!'). Also, compare the German indicative *du sprich-st* ('you speak') with the imperative *sprich!* ('speak!') and the Dutch indicative *jij lees-t* ('you read') with the imperative *lees!* ('read!'). Other imperative forms, however, may show the same endings as their indicative or subjunctive counterparts and rely only on intonation to encode imperativity.

168. IX$_2$ STUDY IMP   [IndSL: Aboh, Pfau & Zeshan 2005:8]
      'You have to study!'

Aboh & Pfau (2011) analyze such lexical markers as «clause-typing morphemes» which «assign a clause to a particular clause type or modality» as also observed in some spoken languages. In the following sections, we will see that lexical markers may occur also in interrogative clauses. As will become clear in the second part of the chapter, the presence of such particles plays an important role in the antisymmetric analysis that I propose for the left periphery and that I will extend also to the derivation of interrogative clauses that apparently require rightward movement of some elements.

4.1.2 Yes/No questions

This section describes the word order and both the lexical and the nonmanual markers of LIS and NGT polar questions.

As far as I could observe, polar questions, also called yes/no questions, are marked in both LIS and NGT by the nonmanual marker "raised eyebrows and head slightly bent forward", as in (169.a) and (169.b). Also, an index functioning as postverbal subject pronoun can occur[74].

169. _____yes/no_____

      a. IX$_2$ SCHOOL$_{LFT}$ 2GO$_{LFT}$ (IX$_2$)   [LIS]
          'Do/did you go to school?'

          _____yes/no_____

      b. TOMORROW PRESENT$_{3a}$ [NGT: Coerts 1992:191]
          'Is he present tomorrow?'

From (169.a) and (169.b), it is apparent that the two languages behave similarly. Also, in both languages, a negative interrogative clause will have two markers: one for the yes/no interrogative and one for the negative. However, remember from §3.1.4 that LIS has a lexical (manual) negative marker as in (170.a), while NGT often employs only a

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[74] In Franchi (1987: 168), LIS yes/no questions are reported without postverbal subject (TU CINEMA VAI? lit. *You cinema go?*) although informants claim that a postverbal subject index is frequently used. As already said, agreement and indexes are described, but not analyzed here.

nonmanual negative marker as in (170.b). Thus, in NGT two nonmanual markers are "layered" or "stacked".

170.
<u>yes/no</u>
a.   IX**2** SCHOOL**LFT** **2**GO**LFT** NOT   [LIS]

<u>yes/no</u>
<u>neg.</u>
b.   IX**2** SCHOOL**LFT** **2**GO**LFT** IX**2**   [NGT]
     'Do/did you not go to school?'

Notice, finally, that in NGT, yes/no questions (171) can also be marked manually, that is lexically, by the sentence-final sign "palm-up", glossed as PU (following Coerts (1992)) or Q-PART, question particle, in Pfau (2006a). In Aboh & Pfau (2011) it is glossed as PU, but it is still treated as a question particle. It is important to notice that, according to Coerts (1992), this particle occurs only in a very limited set of polar questions. In §4.2.3 we shall see that not all analyses coincide in treating PU as a question particle, Q-PART. We may have to do with a sign that takes on different grammatical functions (due to polygrammaticalisation). Related to this is the possibility that there may be distinct, yet homophonous, PU signs, one of which functions as a question particle[75]. Here, as far as interrogative clauses are concerned, I will always use the gloss Q-PART in order to present the reader with homogeneous data and avoid confusion.

<u>yes/no</u>
171.   IX**3** PARTY CANCEL Q-PART   [NGT: adapted from Smith 2004:19]
       'Is the party cancelled?'

In contrast, LIS seems to have no lexical element acting as Q-PART and sentences are only marked nonlexically, that is, only the NMM is observed. In other words, no LIS counterpart of (171) seems to exist.

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[75]The hypothesis of distinct, though homophonous, functional elements is not trivial. In Italian, for instance, one of the masculine singular definite articles (*lo* 'the') is homophonous with the 3rd person singular masculine accusative clitic (*lo* 'him'). In English the complementizer (*that*) and one demonstrative (*that*) are also homophonous.

4.1.3 Wh questions

This section compares the word order and both the lexical and the nonmanual markers of LIS and NGT wh questions. It also compares the variations observed in the interrogative clauses of these two sign languages with the variety of wh interrogative constructions described for other sign languages and some spoken languages. It turns out that phenomena usually associated with rightward movement and final-headedness, such as clause-final wh elements, are attested also in languages with Spec-Head-Compl structure. This observation will turn out to be useful for the analysis, which is presented in the second part of the chapter.

Differences were already observed between LIS and NGT polar questions, and the same goes for wh questions. Both languages have specific wh signs[76] (e.g. WHO, WHAT, WHY, WHERE, and so on) to be used in wh interrogative clauses, usually in clause-final position. However, other markers must co-occur, which differ between the two languages. Crucially, LIS wh interrogative clauses are obligatorily accompanied by a "furrowed eyebrows" nonmanual marker (172.a), (173.a), while NGT (172.b), (173.b) has both a "furrowed eyebrows" nonmanual marker and the same particle Q-PART used for yes/no questions as (171). Since wh signs/words and the question particle can co-occur, they must not be confused with each other. Moreover, since NGT Q-PART is able to co-occur with both the wh NMM and the yes/no NMM, this particle must be analyzed separately from the NMMs in NGT. Thus, LIS sentences (172.a) and (173.a) have a wh sign and a NMM, whereas NGT sentences (172.b) and (173.b) include a NMM, a wh sign, and the sign Q-PART.

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[76] For the moment, I use the generic labels "wh sign" or "wh element". The phrasal status of such signs will be discussed in the second part of this chapter.

172.

   a.   <u>   **wh**   </u>   [LIS]

        IX$_3$ SAY WHAT

        'What did (s)he say?'

   b.   [NGT: adapted from Aboh & Pfau 2011: 21]

        <u>   **wh**   </u>

        IX$_3$ SAY WHAT Q-PART

        'What did (s)he say?'

173.

   a.   <u>   **wh** .   </u>   [LIS]

        BIKE PIX$_2$ STEAL WHO

        'Who stole your bike?'

   b.   [NGT: adapted from Aboh & Pfau 2011: 21]

        <u>   **wh**   </u>

        PIX$_2$ BIKE STEAL WHO Q-PART

        'Who stole your bike?'

In some cases, the wh signs can be dropped. As noted by Aboh, Pfau & Zeshan (2005) and Pfau (2006a, 2006b), wh interrogative clauses in NGT sometimes have no overt wh sign, and only the wh NMM and the interrogative sign Q-PART, as observed in (174.b). Also in LIS wh interrogative clauses, it seems possible to drop the wh signs on some occasions, as in (174.a); in this latter case, only the NMM appears, given that no Q-PART sign exists in LIS.

174.   <u>   **wh.**   </u>

   a.   NAME PIX$_2$ (WHAT)   [LIS]

        'What is your name?'

        <u>   **wh**   </u>

   b.   PIX$_2$ FRIEND NAME Q-PART   [NGT: Pfau 2006a:6]

        'What is your friend's name?'

In NGT, too, it is possible to have wh questions with only NMM, where both Q-PART and the wh sign are omitted. Thus, according to the data, NGT displays a broader range of alternatives than LIS. In (175.a) there is a "fully marked" NGT interrogative clause with wh sign, wh NMM, and Q-PART; in (175.b) we see an interrogative clause with wh sign and wh NMM only; in (175.c) there is an interrogative clause with Q-PART and wh NMM; and in (175.d) the sentence contains a wh NMM only, similarly to LIS (174.a).

175.

   a.   <u>   **wh**   </u>   [NGT]

        IX$_2$ BUY WHAT Q-PART

        'What did you buy?'

   b.   [NGT: adapted from Pfau 2006b:11]

        <u>   **wh.**   </u>

        YESTERDAY IX$_2$ BUY WHAT

        'What did you buy yesterday?'

   c.   [NGT: adapted from Aboh & Pfau 2011:22]

        <u>   **wh**   </u>

        YESTERDAY IX$_2$ BUY Q-PART

        'What did you buy yesterday?'

   d.   [NGT: adapted from Aboh & Pfau 2011:23]

        <u> **top.** </u>   <u> **wh.** </u>

        SHOP IX$_3$ IX$_2$ BUY

        'What did you buy in this shop?'

Two remarks are in order here. First, Pfau (2006a), quoting an example from Petronio & Lillo-Martin (1997), points out that wh interrogative clauses with only wh NMM (i.e. without lexical wh elements) are attested also in American Sign Language. Second, notice that (175.d) contains a topic nonmanual marker, in addition to the wh NMM. I will come back to this issue in §4.1.5. Crucially, however, the relevant part of this sentence, the interrogative part, does neither contain a wh sign, nor Q-PART. It is marked only by the wh NMM. For the moment, consider that, despite the

reported translation for (175.d), the presence of a topicalized constituent suggests a translation like "In this shop, what did you buy?".

As will become clear in §4.2.3, the use of generic signs partially similar to Q-PART is attested also in other sign languages. For the moment, however, I will continue to focus on LIS and NGT. NGT, in addition to the strategies described above, displays also two other constructions for wh interrogative clauses: either reduplication of the wh sign with NMM spreading across the whole clause, as in (177), or clause-initial wh sign with NMM only on the wh sign, as in (178). Reduplication of the wh sign means that NGT allows in clause-initial position a copy of the same wh element usually observed clause-finally. In this case, the wh sign thus appears twice in the NGT clause, once clause-finally and once clause-initially[77], yielding a double-wh question. To the best of my knowledge, no such constructions are attested in the literature on LIS. Thus, a final-wh construction occurs in both LIS and NGT (as seen previously), but in NGT also a double-wh option is available. Let us compare these two constructions. An example of the standard final-wh form is given for LIS (176.a) and NGT (176.b).

176.
        <u>   **wh int.**   </u>
    a.   BOOK STEAL WHO   [LIS]
       'Who steals/stole the book?'

        <u>   **wh int.**   </u>
    b.   BOOK STEAL WHO   [NGT: adapted from Pfau 2006a: 7]
       'Who stole the book?'

At this point, in NGT, the clause-final wh element WHO observed in (176.b) can be repeated once in clause-initial position, yielding the double-wh form (177).

        <u>   **wh int.**   </u>
177. WHO BOOK STEAL WHO   [NGT: adapted from Pfau 2006a:7]
      'Who stole the book?'

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[77] This is not the same type of reduplication as the one observed with nouns, demonstratives or verbs, where the repeated forms of the sign occur adjacently.

As for NGT initial-wh constructions, example (178.a) shows that the NMM affects only the wh sign in this case. In (178.b), however, the NMM spreads on the whole sentence.

178.
        <u>   wh.   </u>
   a. WHAT IX$_1$ t LIKE IX$_1$ [NGT: Van Gijn 2004:149]
      'What do I like?'

   b. <u>   wh.   </u>
      WHO LANDLORD   [NGT: Coerts 1992:203]
      'Who is the landlord?'

In the second part of the chapter, we shall see that LIS, too, has some interrogative clauses in which the wh element appears clause-initially. These LIS and NGT cases will, however, be treated differently from each other. Similar facts have also been observed in ASL, even though they are under debate (Neidle et al. 2000; Petronio & Lillo-Martin 1997). For instance, both groups of authors report the existence of double-wh constructions, but according to Petronio & Lillo-Martin (1997:33) wh-phrases can appear only in the clause-initial position, while according to Neidle et al. (2000:136), this is impossible and a single wh-phrase can only appear clause-finally. It also appears that in ASL, the wh NMM can be restricted to the wh-element only if it is clause-final. A thorough discussion of ASL is beyond the aim of this dissertation, however. Notice also that according to Van Gijn (2004), the wh constituents mostly occur clause-initially in NGT. She offers an account of initial-wh constructions in terms of leftward raising of the wh element. At this point, I would like to point out that, although my analysis, too, is based on leftward raisings, it is not concerned with the frequency with which a given element occurs in a certain position.

    For our purpose, it is only relevant to note that the co-occurrence, in one language, of final-wh construction, initial-wh construction, and double-wh construction is not peculiar to the visual modality, but is observed also in some spoken languages. In the following examples, different wh-constructions of different varieties of Veneto/Venetian[78] are

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[78] *Veneto* is the local name for Venetian. However, Venetian may also refer just to the city of Venice. In contrast, Veneto is used here to refer unambiguosly to the whole group of varieties (not just to the Venetian variety spoken in Venice).

compared to each other. Examples (179.a) and (180.a) show the sentence-initial-wh option, which is the most common one. These examples contain a clause-initial wh word *(co)sa* ('what') or *chi/ci* ('who'). Examples (179.b) and (180.b) show the double-wh construction. The clause-initial *sa* co-occurs with a clause-final *che*, whereas the clause-initial *ci* is reduplicated by a clause-final *ci*. Finally, (179.c) and (180.c) display the sentence-final-wh construction. These examples contain only a clause-final *che* or a clause-final *ci*. The fact that languages in both the visual and the oral modality have such interrogative constructions at their disposal will prove to be important for the analysis presented in the second part of the chapter.

179.

   a. (co)sa galo   magnà?   [Ven.sent-initial]
       what   have.3IND.PR-CLT.M.SG.INT. eaten
       'What did he eat?'

   b.   [Ven. Illasi: adapted from Poletto 2006a:9]
       sa   alo   magnà (che)?
       what have.3IND.PR-CLT.M.SG.INT.   eaten   (what)
       'What did he eat?'

   c.   [Ven. Bellunese: adapted from Poletto 2006b:2]
       alo   magnà   che ?
       have.3IND.PR-CLT.M.SG.INT. eaten   what
       'What did he eat?'

180.
    a. chi xeło / chi èlo / ci èlo[79]?   [Ven. sent.-initial]
        who be.3IND.PR-CLT.M.SG.INT.
        'Who is he?'

    b. ci   èlo   ci ?   [Ven. Verona]
        who be.3IND.PR-CLT.M.SG.INT.   who
        'Who is he?'

    c. èlo   chi?   [Ven. north]
        be.3IND.PR-CLT.M.SG.INT. who
        'Who is he?'

The wh word can be final even when it is a subject, which indicates that final wh words are not in situ since subjects usually precede the verb. For example, compare (181.a) with (181.b), which shows that both the initial and the final position are available for the interrogative subject. In (181.a) the wh element *chi/ci* precedes the interrogative-marked verb *ga(lo)/a(lo)*. In (181.b) the element *ci* appears twice: before and after the verb.

181.
    a.   [Ven. sent.-initial]
        chi ga / ci ga(lo) / ci a(lo)   magnà ła mé torta?
        who has.3IND.PR(-CLT.M.SG.INT.) eaten   the my cake?
        'Who has eaten my cake?'

    b.   [Ven. Illasi: adapted from Poletto 2006b:10]
        ci   à   magnà ci,   la   me torta ?
        who has.3IND.PR.   eaten who the   my cake?
        'Who has eaten my cake?'

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[79] The form *ci èlo* is commonly used in Veneto variety spoken in Montecchia di Crosara, for instance, on the border between Verona and Vicenza provinces: this probably accounts for the fact that veronese *ci* is used, but its placement follows the more usual sentence-initial construction observed in the other varieties, rather than occuring in the double-wh construction of Verona (180.b)

Two remarks are in order here. First, Poletto's example (181.b) shows that the final wh position in Veneto is not properly sentence-final. Rather it follows the interrogatively-marked verb. However, as will become clearer in the second part of the chapter, the analysis is centered on the availability of multiple wh positions in the structure. The way in which projections are used and the material employed to fill them may well vary from language to language. The analysis does not aim to demonstrate and does not require that sign languages behave exactly like Veneto. Thus, for the sake of simplicity, I am using the terms "(sentence/clause-)initial" and "(sentence/clause-)final" for both Veneto and the sign languages. Secondly, the sentence quoted from Poletto (2006b:10) seems to exclude the interrogative subject clitic *–lo* with a subject wh element. Actually, if I think of myself speaking with my friends in the central variety, I would prefer the form *chi ga* without clitic. However, in my opinion, the co-occurrence is not entirely ruled out. As a native speaker, I do not perceive a question like *Ci (g)alo magnà la mé torta?* as ungrammatical, at least if I think of myself speaking with my grandparents in the Veneto variety of Montecchia di Crosara (prov. of Verona). My relatives that live there also accept the interrogative clitic. Anyway, regardless of the issue of the optionality of the interrogative clitic, Poletto's example in (181.b) shows that the final wh position is not in situ, because it can be occupied by a subject wh element *ci* ('who') which reduplicates the initial wh element. This variety of constructions will be investigated in more depth in the analysis in §4.2.3; there, we shall see that some hypotheses for spoken languages can also be applied to the analysis of sign languages.

Now, turning back to LIS and NGT, a couple of final remarks must be made. First, although the wh NMM usually spreads onto the whole interrogative clause, some material can fall outside the of the NMM as in (175.d). As that example shows, and as will become clear in §4.1.5, this happens when topicalization occurs. Secondly, I would like to draw attention to the possibility of having, at least in LIS, complex wh-phrases where the noun is split from the interrogative element WHICH that accompanies it (Cecchetto et al. 2004; Geraci 2009). In split forms, the sign WHICH occurs clause-finally, while the noun remains in situ (e.g. between verb and subject, if it is an object). Alternatively, complex wh-phrases behave like other wh phrases, appearing as a unit either in clause-final position or in situ. Thus, in (182.a) the whole complex WHICH BOOK occupies the standard clause-final position, in (182.b) the whole complex

is in situ (between subject and verb), and in (182.c) it is split, with the noun remaining in situ and WHICH appearing clause-finally. According to Geraci (2009), the split option is the preferred one in d-linked contexts. No NMM is given. I have not been able to determine whether split complex wh-phrases are available also in NGT.

182.
   a. STUDENT BUY BOOK WHICH   [LIS: Geraci 2009: 142]

   b. STUDENT BOOK WHICH BUY   [LIS in situ: Geraci 2009:142]

   c. STUDENT BOOK BUY WHICH   [LIS split: Geraci 2009:142]
       'Which book did the student buy?'

From this comparison between the sign modality and the spoken modality, it appears that the relevant difference is only that LIS allows wh-phrases in situ, in addition to clause-final, clause-initial, and doubled wh elements. This difference, however, does not make the analysis problematic. The data presented in this section, although reflecting a large variety of constructions and despite proceeding from very different languages, are compatible with a unified account which will be proposed in §4.2.3. That analysis will also benefit from further data obtained from other sign languages.

4.1.4 Other interrogative clauses: alternative (content) questions

This brief section addresses constructions used for alternative content questions. The data presented here serve to shed some more light on the distribution of the so-called 'yes/no' nonmanual marker in order to suggest some speculations about its function and to refine the analysis of polar questions that will be proposed in §4.2.4.

Besides yes/no and wh questions, another kind of interrogative clause exists: it cannot be answered with "yes" or "no" because it requires a content answer (as wh interrogatives do), yet it resembles a yes/no question in that no wh phrase appears. Here a choice has to be made from two (or more) possible answers, see examples (183.a) and (183.b).

183.	_____
	           y/n int.

  a.	IX**₂** WORK (IX**₂**) STUDY	[LIS]
	'Do you study or do you work?'

	_____
	           y/n int.
	_____ _____
	  head RGT **head LFT**
  b.	IX**₂** WORK (IX**₂**) STUDY	[NGT]
	'Do you study or do you work?'

The answer to (183.a) and (183.b) cannot be "yes/no", but must be a content answer (WORK or STUDY). Unlike wh questions, the answer is usually restricted to the options explicitly stated by the speaker. A slight pause appears between the two options and the subject can be repeated before each verb. The suggested alternatives are often distinguished by a head tilt in different directions, to the left or right, for instance (a kind of spatial marking resembling that used to locate referents). I have not been able to determine whether head tilt is obligatory in these sentences. In (183.a) the break between the two alternatives was sufficient for the informant to understand the sentence. He did not claim that it was ungrammatical. However, the relevant fact here is that the 'yes/no' NMM is present even in alternative content questions. Crucially, these interrogative clauses require the same 'raised eyebrows' NMM as yes/no questions. This observation will turn out to be crucial in the analysis proposed later.

4.1.5 Topicalization

In this section, the position and marking of topicalized contituents in LIS and NGT will be addressed together with the interaction of topicalization with the imperative and the interrogative constructions described in §4.1.1, §4.1.2, and §4.1.3. This information will help refine the structure of left periphery proposed in the second part of this chapter. In addition, these data serve as a background for chapter 5, which deals with relative clauses, given that some of these constructions have features (position in the sentence and nonmanual marking) similar to those of topicalized constituents.

Topicalization marks (different kinds of) given or "already known" information in a sentence. It is indicated by nonmanual markers and sign

order changes in both LIS and NGT (see Coerts (1992) and Crasborn et al. (2009)). The topicalized constituents are usually accompanied by 'raised eyebrows' and are fronted, that is, they appear at the beginning of the sentence. They are also usually separated from the remaining part of the sentence by a slight pause, a "comma" break (**,**). LIS and NGT pattern alike with respect to this. However, many other languages, both signed and spoken, also have fronted topicalized arguments and employ nonlexical markers (intonation or NMM). In LIS and NGT, topicalized objects in (184.a, 184.b) and (185.a, 185.b) are easily detected since fronting yields an OSV order, different from the SOV sequence found in plain sentences (see chapter 3). As Crasborn et al. (2009:362) point out, 'raised eyebrows' marking is not obligatory on all NGT topics. In §4.2.5 we shall see that in LIS, too, not all topics may be marked with 'raised eyebrows', although this may depend on reasons different from those suggested by Crasborn et al. for NGT.

184.

    a.   <u>   **top.**   </u>   [LIS: Bertone 2007: 134]

        LIBRO IX_Y IX_1 PIETRO$_J$ $_1$REGALARE$_J$

        book   ix   I   Peter   give-as-present

        'That book, I gave it to Peter as a present'

    b.   <u> **top.** </u> <u>   **cond** </u>   [NGT: Pfau 2006a:8]

        BOOK **,** SUPPOSE SUNDAY IX_2 $_2$VISIT$_1$ IX_1 $_1$GIVE$_2$

        '(As for) the book, if you visit me on Sunday, I will give it to you'

185.   <u>   **top.**   </u>

    a.   SCHOOL IX_{LFT} **,** IX_1 $_1$GO$_{LFT}$ NOT   [LIS]

        '(As for) The/That school, I don't go there'

    b.   BOEK IX_{RGT}**,** IX_{LFT} WEGGOOIEN (IX_{RGT})[NGT: rep. from (27.b)]

        book that/there he   throw away (it)

        'He threw away the book'

Fronting of topicalized subjects is less visible since subjects usually precede verbs and objects also in plain sentences. Therefore, when they

are fronted, the surface order of elements may remain apparently unchanged. However, the fronting of topicalized subjects is visible with respect to some time adverbs. Recall from §3.1.1 that time adverbs are usually sentence initial, so that they precede the subject. In contrast, when a subject is topicalized as in (186.a) and (186.b), it comes to precede the time adverb. Again, an intonational break separates the topic from the rest of the sentence and the topic NMM signals the topicalized constituent, in this case the subject. A resumptive indexical pronoun may also appear in the sentence. In other cases, for instance in (186.c), the NMM and the intonational break are the sole indication of the topicalized subject.

186.

    a.   <u>   **top.**   </u>   [LIS]
         BROTHER PIX$_1$ IX$_{RGT}$, EVENING IX$_{RGT}$ $_{RGT}$VISIT$_1$
         '(As for) My brother, he is visiting me this evening'

    b.   <u>   **top.**   </u>   [NGT: repeated from (27.a)]
         PIX$_1$ BROTHER IX$_{RGT}$, EVENING IX$_{RGT}$ $_{RGT}$VISIT$_1$
         '(As for) My brother, he is visiting me this evening'

    c.   <u>   **top.**   </u>   [NGT: Coerts 1992:223]
         AIRPLANE FROM AMARIKA IX$_{3a}$, MUST $_{3a}$COME$_1$
         'The airplane that comes from America, must come'

Topicalizations may co-occur with other phenomena described earlier in this chapter, such as imperative or interrogative clauses. For instance, sentence (175.d) in §4.1.3 contained a topic NMM and also a wh NMM. More examples from both LIS and NGT are given here. The two languages pattern alike as the sentences judged grammatical by LIS informants have the same linear order as the NGT sentences. For instance, in both LIS and NGT, the topicalized argument precedes the imperative (187.a), (187.b), the polar interrogative clause (188.a), (188.b), and the wh interrogative clause (189.a), (189.b). The NMM clearly indicates that the topicalized constituent is the first element of the sentence (as a noun, it can be accompanied by an index).

187.
                 <u>   **top.**   </u> <u>   **imp**   </u>

    a.   TICKET IX$_{LFT}$ **,** EVENING **₂**GIVE**₁**   [LIS]

        'The ticket, give it to me this evening!'

        <u>   **top.**   </u>   <u>   **imp**   </u>

    b.   TICKET **,** EVENING **₂**GIVE**₁**   [NGT: Pfau 2006a:7]

        'The ticket, give it to me this evening!'

188.
           <u>   **top.**   </u> <u> **y/n** </u>

    a.   TICKET IX$_{LFT}$ **,** IX**₂** BUY IX$_{LFT}$ [LIS]

        '(As for) The ticket, did/do you buy it?'

        <u> **top.** </u>   <u> **y/n NMM** </u>

    b.   TICKET **,** IX**₂** BUY IX$_{LFT}$ [NGT]

        '(As for) The ticket, did/do you buy it?'

189.
           <u> **top.** </u> <u>   **wh**   </u>

    a.   BOOK IX$_{LFT}$ **,** STEAL IX$_{LFT}$ WHO   [LIS]

        'As for the book, who stole it?'

        <u> **top.** </u> <u>   **wh**   </u>

    b.   BOOK **,** STEAL WHO Q-PART   [NGT: Pfau 2006a:7]

        'As for the book, who stole it?'

Finally, in sign languages, more than one topic can occur in one sentence. In NGT (190.b) and in its LIS counterpart (190.a), there are two topics: they are distinct from the remaining part of the sentence, as the NMMs show, but they are also separated from each other by a pause and possibly[80] by the spreading of the NMM. The interrogative clause follows both topics.

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[80] The break in the spreading of NMMs may be less visible if the sentence is signed quickly.

190.

a.   <u>   top.   </u>   <u>   top   </u> <u> yn. </u>   [LIS]

SCHOOL IX$_3$, TOMORROW EVENING MEETING , IX$_2$ LIX$_3$

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

b.   [NGT: Pfau 2006a: 12)]

<u>   top.   </u> <u>   top   </u> <u> yn. </u>

SCHOOL IX$_3$, TOMORROW EVENING MEETING IX$_3$, IX$_2$ BE-PRESENT$_3$ IX$_2$

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

A similar phenomenon is observed in many spoken languages. In Italian, for instance, it is possible to have two co-occuring topics in the same sentence. Some examples are given and discussed briefly in the second part of the chapter, during the analysis in §4.2.5.

4.1.6 Summary

So far we have seen that sign languages make use of different constructions such as topicalizations, imperative clauses, polar and wh interrogative clauses, as well as alternative content questions. Although these constructions are mainly marked nonmanually, that is, nonlexically, there is some evidence that they involve the movement (or merger) of some material in(to) some specific positions. Data from LIS, NGT, and IPSL suggest that some of these positions are in the left periphery of the sentence, as observed also in many spoken languages. Topicalized arguments, for example, precede affirmative and negative clauses, imperatives, and polar and wh interrogative clauses in LIS and NGT (in the next chapter, additional phenomena such as conditionals and relative clauses will be described supporting this fact). Also, in both sign languages, a sentence can contain more than one topic and the topics precede the (affirmative, interrogative or negative) clause. Thus, in the vast majority of cases described here, the linear orders of LIS and NGT are alike.

The data presented also show that wh questions allow for various realizations: final-wh interrogative constructions, initial-wh interrogative constructions, double-wh interrogative constructions (where a clause-

final wh sign co-occurs with a clause-initial wh sign), interrogative constructions without specific wh signs, and constructions where complex wh-phrases are split (into a final wh element and an in situ noun). Final-wh constructions appear to be the most frequent option in LIS. Double-wh constructions and initial-wh construction are only observed in NGT (in the second part of this chapter, we shall see that LIS has some apparently initial-wh questions which, however, have a different structure than the ones in NGT). LIS, however, has split complex wh-phrases, which are not attested in the NGT data. In this respect, thus, LIS and NGT do display some crosslinguistic variation, in addition to similarities. However, this variety of data, which at first sight could appear to be specific to sign languages, shows interesting parallels with some spoken languages in which wh questions clearly involve leftward movement.

4.2 Analysis

In this section, a split-CP structure for the left-periphery of the sentence will be proposed (following Rizzi (1997, 2001)) in order to account for the different phenomena described in the first part of the chapter. On the basis of the comparison made in §4.1.3 between sign language and spoken language data, it proposes that some LIS and NGT constructions that apparently involve rightward movement, actually involve the left periphery of the sentence. Topicalizations, imperative clauses and different types of interrogative clauses are analyzed using an antisymmetric model.

4.2.1 Introduction

The fact that topicalized constituents in LIS and NGT are fronted to the left of the main clause and that sign languages (e.g. IPSL) may have a final imperative lexical marker can easily be incorporated in an antisymmetric approach, which assumes one and the same deep structure for all languages. This will be explained in the following sections of this chapter. We will also see that some accounts in terms of antisymmetry have successfully been proposed, even for some clause-final particles (e.g. NGT Q-PART in interrogative clauses). These accounts are, however, slightly modified in this dissertation.

The distribution of the fronted material and the fact that the sign languages investigated here share fronting of topicalized constituents with spoken languages strongly suggest an account in terms of Rizzi's (1997, 2001) split-CP. He proposed that the CP domain is made up of different projections merged according to a Spec-Head-Compl structure where leftward raising applies, as will become clearer throughout this chapter. The antisymmetric accounts given for clause-final imperative markers and for some clause-final interrogative particles imply that the split-CP hypothesis is compatible also with imperative constructions as well as with some interrogative clauses. This, in turn, suggests that it is possible to analyze also some other CP-related phenomena in terms of Spec-Head-Compl structures and leftward raising. Such phenomena, at least as far as LIS is concerned, have up to now been analyzed with structures involving a head on the right of the complement and possibly rightward movement toward a specifier located to the right of the head.

As a consequence of this, much of the following analysis will be devoted to the account of wh-questions, the only LIS (and NGT) phenomenon apparently at odds with leftward movement. Capitalizing on the observation that final-wh and double-wh questions of sign languages resemble those found in some spoken languages with leftward movement (§4.1.3), a leftward raising account will be proposed also for LIS and NGT (for a leftward raising account of NGT wh-questions, different from the present analysis, see Van Gijn (2004)). This account, although, at first sight requiring the postulation of unnecessary projections, is able to explain not only the similarities between LIS and NGT, but also the similarities between the two sign languages, on the one hand, and some less known spoken languages with a [Spec;CP] on the left, on the other hand. The seemingly unnecessary projections, thus, turn out to be independently motivated by phenomena observed also in spoken languages and are no longer ad hoc hypotheses made to force sign languages into an antisymmetric model. The second part of the chapter is structured as follows: §4.2.2 sketches the structure of the split-CP and accounts for imperatives and topics; §4.2.3 tackles wh questions; §4.2.4 discusses yes/no questions (exploiting some observations about wh questions and alternative content questions); and §4.2.5 discusses some residual phenomena concerning topics and the spreading of nonmanual markers in wh questions. It is important to note that the data about topicalization presented in §4.1.5 will be discussed partly in §4.2.2 and

partly in §4.2.5 because topicalization interacts with both imperative and interrogative clauses.

4.2.2 Structure and movement in topicalizations and imperatives

Imperative clauses and topicalizations in sign languages can be accounted for in terms of a very simple split-CP structure. Rizzi (1997) working on spoken languages proposed that the CP domain is made of some projections dedicated to topicalized and focalized material. Moreover, a projection for finiteness encodes the difference between finite clauses and infinite clauses. For instance, in Rizzi's view, FinP hosts prepositional, nonfinite complementizers in Italian (e.g. *di*) and finite complementizers in Irish (e.g. *go*). The topic projections were assumed to be recursive, framing the focus position. The first proposal of split-CP structure was thus:

191. Force…Top…Foc…Top…Fin (…IP)

Later, Rizzi (2001) separated the projection for interrogativity (hosting the Italian interrogative complementizer *se* 'if') from that of force, which ultimately should be reserved for the declarative complementizer. In this way the difference between matrix and embedded clauses is encoded.[81] The split-CP structure is thus reformulated as (192) with the interrogative projection above FocP. Notice that the interrogative projection is called IntP in Rizzi, but also the label InterP is used in the literature. In this dissertation, I will use InterP.

192. Force…Top…Int(er)…Foc…Top…Fin (…IP)

This structure was mainly proposed on the basis of data drawn from Italian, but it can also account for the linear ordering (and the nonmanual

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[81] Alternatively, Haegeman (2004) and Bhatt & Yoon (1992) maintain that ForceP encodes interrogativity, but a higher SubP is dedicated to subordinators. Also, Poletto & Pollock (2004) and Munaro & Pollock (2005) assume ForceP as the projection encoding interrogativity. Further refinements are discussed in Benincà (2001) and Benincà & Poletto (2004). What is relevant for this dissertation, however, is that the projection for interrogativity is not the highest projection inside the split-CP.

marking) of LIS and NGT signs in a straightforward way, as will become clear in the following sections. As noted by Pfau (2006a, 2008a), this hierarchy of projections directly reflects the ordering of a number of constituents in NGT (some combinations of elements which in Pfau's account seem problematic for Rizzi's structure, will be discussed in chapter 5 showing that their incompatibility follows from independent, albeit unexplained, properties of NGT). In Pfau's view, the spreading of the topic NMM, the imperative NMM, and the interrogative NMM on these constituents reflects the fact that (part of) the sentence has been attracted to the specifier of the relevant projection, where nonmanual marking is assigned under spec-head agreement. Thus, the linear order of topicalized constituents, imperative-marked constituents, and interrogative-marked constituents in NGT reflects the fact that they occupy distinct projections, ordered according to Rizzi's hierarchy. Since, in this respect, LIS shows the same ordering of elements as NGT (see §4.1.6), Pfau's proposal can also be safely adopted for LIS. In fact, for instance, constituents marked as topic can precede interrogatively-marked constituents and imperative-marked constituents in both sign languages, as predicted by (192). Brunelli (2007, 2009) analyses some left periphery phenomena of LIS on the basis of Pfau's (2006a) proposals concerning NGT. This analysis forms the basis of this chapter.

Crucially, Rizzi's hierarchy assumes a Spec-Head-Compl phrase structure which branches from left to right and where leftward movement applies, that is, an antisymmetric structure. In this light, LIS and NGT topicalized elements, which are fronted to the left of the sentence, as in (184), (185), (186), reflect the leftward movement. Topics come to occupy [Spec;TopP] which is to the left of other projections. Here, they receive the topic NMM as argued by Pfau (2006a, 2008a). Notice that I do not address the question as to whether a given topicalized constituent is moved to or merged in a topic projection[82]. The relevant factor is the left position of the specifier where they are merged or moved to. Along

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[82] The debate about topics being moved to or merged in TopPs is often related to the presence of resumptive clitics. As already pointed out, however, this dissertation does not analyze the distribution of clitics. I will restrict myself to the position (left or right) in which topics are located with respect to the sentence, regardless of them being moved to or merged in that position. As topics sit in specifiers, the fact that they precede other elements indicates that they occupy a specifier of TopP which is to the left of other projections, as predicted by Rizzi's split-CP.

similar lines, sentence-final signs, among which the IPSL final lexical IMP marker of (168), are analyzed by Aboh & Pfau (2011) as clause-typing morphemes located in a head which has a Spec (on the left) filled by leftward movement of the remaining part of the sentence.

> «We therefore propose that these functional items surface in sentence-final position because they take scope over the proposition, which is attracted into their specifiers.» (Aboh & Pfau 2011:18)

Moving leftwards to this specifier, the clause not only comes to precede the imperative particle, if any, but also receives the imperative NMM (if the language has such a NMM). Just as topics receive the topic NMM in the specifier of TopP, imperatives receive the imperative NMM in the specifier of an imperative-mood-related projection where they come to sit. According to this view, in LIS (167.a) and NGT (167.b), the imperative NMM spreads over the whole clause because this has been moved to a specifier where it receives the nonmanual marker. The only difference between IPSL, on the one hand, and LIS and NGT, on the other hand, is that the imperative head is not overtly realized in these two latter languages. Consequently, no final particle is visible in LIS and NGT. As for which projection is the landing site of the imperative clause, Pfau (2006a) assumes that imperatives move leftwards to FinP, extending to sign languages Aboh's (2004) proposal based on spoken languages. The same derivation can be adopted for LIS, as suggested by the comparison of LIS and NGT. IPSL contrasts with LIS and NGT in that IPSL has the IMP particle in Fin° (168), according to Pfau (2006a) and Aboh & Pfau (2011), whereas Fin° is not lexically realized in LIS and NGT. The nonmanual marker, however, is always assigned under spec-head agreement to the (part of the) sentence that has raised to [Spec;FinP]. Thus, sentences like LIS (167.a), NGT (167.b), and IPSL (168) are explained with the same account and the same deep structure. The derivation of these sentences requires only one projection, namely Rizzi's FinP. However, the fact that Rizzi's hierarchy contains a number of topic projections above FinP accounts also for the fact that the moved imperative constituent can still be preceded by topicalized elements, as in LIS (187.a) and NGT (187.b). The structure of sentences as (187.a), (187.b), (167.a), (167.b), and (168) then looks as sketched in (193). Imperative clauses move leftwards to [Spec;FinP] where they receive the

imperative NMM and may come to precede the lexical IMP marker (as in IPSL), whereas topics occupy [Spec;TopP] which is higher and more to the left.

193. Derivation of NGT, LIS and IPSL imperative:
topic (if any) → Spec;TopP, and IP → Spec;FinP. Fin° = IMP or Ø

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                            TopP
                          /      \
                                  Top'
                                 /    \
              Spec            Top°      \
              TICKET          [+top]     \
                                          FinP
                                        /      \
                                               Fin'
                            Spec              /    \
                    IX₂ t_ticket 2GIVE₁      /      \
                    IX₂ BOOK 2GIVE₃      Fin°        \
                      IX₂ STUDY          Ø/IMP    ( IP )
                                         [+imp]   (  /\  )
                                                  ( /__\ )
                                                  (   t  )
```
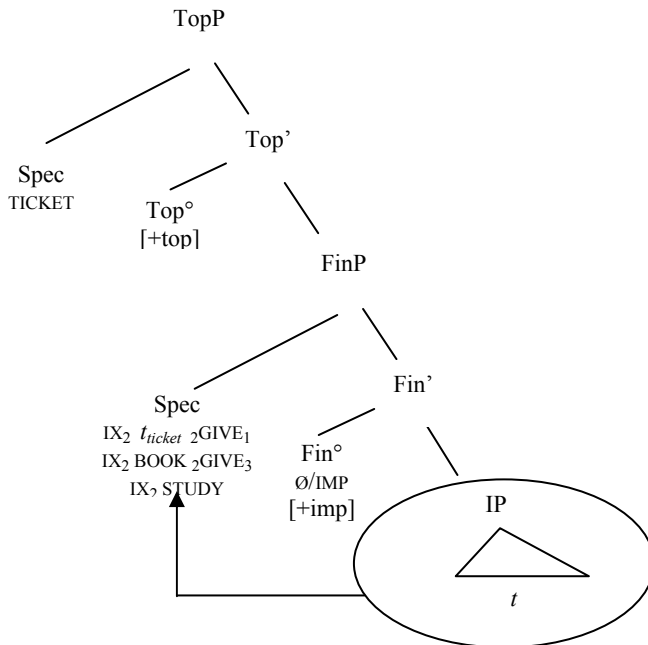
Thus, if we follow Pfau (2006a) and Aboh & Pfau (2011), the behaviour of imperatives and topics in LIS, NGT and IPSL proves to be easily compatible with an antisymmetric organization of projections in the CP-domain and parallels the behaviour of spoken languages, suggesting that this structure is indeed universal. I wish to conclude this section by anticipating some observations to be developed in the following sections. The fact that topic projections are high in the structure also explains why topicalized elements are observed to the left of interrogative clauses as (189.a) and (189.b) and even to the left of conditional clauses, themselves assumed to raise leftwards (see chapter 5). Finally, sentences like (190.a) and (190.b) prove that different topic projections exist because multiple topics may co-occur. In §4.2.5, attention will be drawn to the fact that

these topic positions may encode partially different types of (given) information.

4.2.3 Structure and movement in wh questions

In the previous section, a fairly simple structure of the CP domain could be adopted to account for topicalizations and imperatives. In this section, it will turn out that actually, a more complex structure of the CP domain has to be assumed to account for the various constructions used to form wh questions in LIS and NGT. Such an account must be assumed to hold for all other languages as well, given that the antisymmetric model presumes that all languages have one and the same structure. The analysis will be developed on the basis of data from both sign languages and spoken languages.

With respect to wh-questions in sign languages, there has been an extensive debate about the position of wh-signs. On the basis of the linear order of elements and the spreading of the wh NMM in the sentence, different authors (among others, Petronio & Lillo-Martin (1997), Neidle et al. (1997), and Neidle et al. (2000) for ASL; Cecchetto, Zucchi & Geraci (2004, 2006) for LIS) have suggested either a leftward or a rightward movement of wh-signs[83] such as WHO, WHERE, WHAT, and so on. Despite making different (in fact, opposite) claims, all these proposals have in common that they postulate a relation between the place of the wh-sign in the sentence and the point where the wh NMM starts to spread. In this respect, the presence of double-wh constructions has been a major challenge.

Yet, as Aboh, Pfau & Zeshan (2005) and Aboh & Pfau (2011) point out, wh-questions with wh NMM can occur without any specific wh-signs. Only an invariable generic wh-particle occurs instead (e.g. IPSL G-WH), which they call a clause-typing morpheme (in their view, it is not a wh phrase). Conversely, languages may employ specific wh-elements such as 'who, where, what…' in noninterrogative constructions, as is the case in relative clauses in some spoken languages. For example, in English the word 'who' can occur in relative clauses as *The person who*

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[83] As said in the first part of this chapter, I am using the labels "wh sign", "wh word" or "wh element". For the moment, I simply distinguish "(specific) wh signs/words/elements" from "(generic) particles" (e.g. wh particles or question particles). The phrasal or head-like status of these two categories of elements will be discussed throughout this section.

is speaking now was Prime Minister in 1993. This shows that the "wh-ness" of an interrogative clause is partially independent from the actual occurrence of specific wh-signs (or words) in both sign languages and spoken languages. This, in turn, opens up the possibility that the spreading of the wh NMM in sign languages is not entirely dependent on the position and even the occurrence of these wh-signs.

Data from NGT and IPSL have also led Aboh (2004), Aboh, Pfau & Zeshan (2005), and Aboh & Pfau (2011) to observe an important parallelism between the NGT "palm-up" question particle Q-PART (also glossed PU, see §4.1.3) and the IPSL generic wh-particle G-WH. In fact, both G-WH and Q-PART appear in sentences which do not contain a specific wh sign. For instance, in NGT (194.a) and IPSL (194.b), both particles cover the function of 'what', while in NGT (195.a) and IPSL (195.b), they also cover the function of 'when' and 'where', respectively. Notice that the wh NMM of IPSL spreads optionally over the whole sentence and obligatorily onto G-WH (Pfau 2006b), even though in other examples, it appears only on this particle (Pfau 2006a; Aboh & Pfau 2011). However, Aboh & Pfau's analysis, on which the present discussion is based, does not rely on the optionality of NMM spreading[84].

194.

    a.   <u>   **wh**   </u>   [NGT: repeated from (175.b)]

            YESTERDAY IX$_2$ BUY Q-PART

            'What did you buy yesterday?'

    b.   [IPSL: adapted from Pfau 2006a:6]

                             <u>   **wh.** </u>

            YESTERDAY IX$_2$ PAY^TAKE G-WH

            'What did you buy yesterday?'

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[84] In fact, there is a whole group of IPSL examples, among which (194.b), which display optional spreading in Pfau (2006b) and no spreading in Aboh & Pfau (2011). Where possible, I report Pfau's (2006b) glosses, which illustrate the broader range of options available in IPSL for the realization of those sentences. I do so in order to avoid the impression that spreading of the IPSL wh NMM beyond G-WH is ungrammatical.

195.
    a.   [NGT: adapted from Aboh & Pfau 2011:22]

                                            wh
    TRAIN FRANKFURT LEAVE Q-PART
    'When does the train to Frankfurt leave?'

    b. (   ) **wh.**   [IPSL: adapted from Pfau 2006b:8]
    PIX$_2$ FRIEND SLEEP G-WH
    'Where does your friend sleep?'

Aboh & Pfau point out that many spoken languages employ question particles, too, as, for instance, Lele *ga* and Japanese *ka*, and propose that these particles, as well as the particles Q-PART and G-WH, sit in Inter°, the head of the interrogative projection. According to the authors, these particles occur in final position because the proposition moves (leftwards) to the specifier of the interrogative projection (just as imperative clauses move to the specifier of the imperative projection, as argued in §4.2.1). It must be noted that there is no consensus over the fact that Q-PART occupies Inter°. The low frequency with which it appears in yes/no questions (see §4.1.2 and §4.1.3) seems at odds with its being a question particle. Crasborn et al. (2006) and Van der Kooij et al. (2006) propose an alternative account and treat it as a boundary marker which does not only appear in interrogative clauses [85], but rather depends partly on prosody and partly on syntactic factors. In fact, they employ the gloss PU, not Q-PART. Van der Kooij et al. suggest that it may also function as an

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[85] See, for instance, the following example from Bos (1995):
1.   [NGT: Bos 1995:132]

                                   neg
    SEE INDEX$_1$ PU2 NOT-YET REMEMBER(+) INDEX$_2$ PU
    'I see that you still don't remember (how the computer works)'

If this is confirmed, it means that this sign is not interrogative *per se* but might rather mark uncertainty on the Speaker's part. Alternatively, two homophonous PU particles with distinct functions could be assumed. Further investigation is necessary on this issue. However, since the existence of interrogative marking is proved by other languages, I will follow Aboh & Pfau (2011) in taking Rizzi's interrogative projection to be active also in NGT interrogative clauses, and I extend this hypothesis to LIS.

evaluative marker. It is thus possible that further research brings conclusive evidence that Q-PART occupies a syntactic position different from Inter°. Given the different contexts in which this particle occurs, another possibility to explore is that we may have to do with homophonous particles which have distinct functions: only some of the signs glossed as Q-PART/PU would be Q-PART proper. Thus, determining the exact structural position(s) of Q-PART may require further research. However, given that Q-PART occurs in interrogative clauses and in order to avoid ad-hoc proliferations of projections, here I provisionally assume that, at least as far as interrogative clauses are concerned, it occupies Inter°, following Pfau & Aboh (2011). I will attempt at verifying whether this assumption is compatible with an antisymmetric structure. As Aboh & Pfau note, the IPSL particle G-WH marks only wh-interrogative clauses, whereas Lele *ga*, Japanese *ka*, and NGT Q-PART may appear in **all** interrogative clauses, yes/no questions included. See the NGT example (171), repeated here as (196), where Q-PART occurs in a polar question.

196. $\overline{\text{IX}_{3} \text{ PARTY CANCEL Q-PART}}^{\text{yes/no int.}}$ [NGT: repeated from (171)]
        'Is the party cancelled?'

Moreover, the sign Q-PART is neutral as to which nonmanual marker is used because it can occur with either yes/no NMM or wh NMM. In contrast, according to the data, IPSL G-WH is strictly related to the wh NMM and to the "wh-ness" of the interrogative clause. It seems thus that the function of particles as G-WH is not only different from that of specific wh-signs (WHO, WHERE, WHAT, etc.), but also different from that of particles such as Q-PART, *ga*, *ka*. The particle G-WH has the function of a wh lexical marker (accompanied by a wh nonmanual marker). In contrast, the particles Q-PART, *ga*, and *ka* are really question particles, that is, (lexical) interrogative markers that occur in questions regardless of whether they are yes/no or wh questions. Crucially, the NGT counterpart of G-WH appears to be the wh NMM rather than Q-PART. In other words, the NGT wh NMM has more in common with IPSL G-WH (and its wh NMM) than NGT Q-PART has. Indeed, what really marks wh-questions in NGT is neither the specific wh-sign, which can be omitted as in (174.b), (175.d), (194.a), and (195.a), nor the Q-PART which occurs also in yes/no questions as (196) and, conversely, can be omitted in wh

questions as (175.d). In contrast, what marks wh-questions, that is, what must always be present in NGT wh-questions, is the wh NMM. The same holds for the wh NMM in LIS: in this language, there is no Q-PART, the specific wh signs can be omitted as in (174.a), but the wh NMM must always be present. Thus, the LIS and NGT wh NMM acts like the lexical G-WH marker of IPSL, which marks wh questions and is also accompanied by a NMM. This means that wh marking is only nonmanual in some languages (LIS and NGT), but involves also lexical material in other languages, which have a lexical generic wh marker (IPSL).

In light of this, wh marking is no longer simply a matter of spreading of nonmanual markers. Rather, it involves features which can be spelled out also lexically, at least in some languages. Because of this, however, the examples also give evidence that wh marking (G-WH and/or NMM) is partially independent from interrogative particles (*ga*, *ka*, Q-PART) and from specific wh signs (the questioned element 'who,what,where' and so on…). In fact, not only does wh marking occur without wh signs (see Aboh, Pfau & Zeshan 2005), but also interrogative marking (e.g. Q-PART) occurs without wh marking (in polar questions). We must therefore conlcude that in wh-questions three distinct elements must be always distinguished: *interrogative particle* (or interrogative marker)*, wh marker (lexical and/or nonmanual)* and *specific wh elements* (words or signs), henceforth SWH. Languages vary as to which of these elements are realized lexically. Two consequences follow from this. First, following Aboh's (2004) proposal for interrogative intonation in Gungbe[86] and Aboh & Pfau (2011), the wh nonmanual marker can be taken as the prosodic effect of a morpheme which is either phonetically null or **also** realized lexically (for instance the G-WH sign). According to this, when the NMM is visible and the language has no overt G-WH morpheme, a zero G-WH-like morpheme must be assumed in the clause. Second, the function of this morpheme is to specify that the interrogative clause is of the wh-type. Thus the morpheme realizes a feature different both from the one of interrogative markers (as Q-PART) and from that of SWHs.

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[86] While Aboh (2004) dealt with an interrogative marker occurring in all interrogative clauses, the peculiarity of NGT and LIS wh nonmanual markers and the IPSL lexical G-WH marker is that they encode "wh-ness" rather than pure interrogativity, since they do not occur in yes/no questions. His proposal to relate lexical and non lexical marking of syntactic phenomena is still valid, however, and applicable to LIS and NGT.

Granted that interrogative particles realize a feature encoded in Inter°, the data suggest that the wh NMM and G-WH may sit in a projection[87] distinct from InterP, as well as distinct from the position of SWHs. This amounts to saying that wh questions may involve three distinct elements (interrogative particle, wh marker and SWH) because their construction involves three distinct projections. Wh questions, besides having a projection encoding the [+interr] feature, also have two wh positions, one related to the presence of SWHs and the other related to "pure" wh-marking (G-WH sign and/or wh NMM) which encodes only the "wh-ness" of the interrogative clause. Following this hypothesis, the wh NMM would be always related to this latter position, be it filled by a G-WH or lexically empty. This would explain why the wh NMM is not related to the position of SWHs.

This proposal does raise some questions as to how the two positions are represented structurally. First, if this hypothesis is correct, one would expect to find at least some language in which in wh questions the two wh-related positions are lexically filled at the same time, in addition to displaying interrogative marking. Until now, indeed, we only have on the one hand some languages where G-WH (and/or wh NMM) **acts** differently from both SWHs and pure lexical interrogative markers and, on the other hand, languages where lexical interrogative markers and wh-signs/words co-occur, thus indicating that each of them fulfils a distinct function. Admittedly, IPSL also has some wh questions where the G-WH is accompanied by more specific signs as, for instance, PLACE or FACE, to express more specific meanings (e.g. 'where', 'who'), but these signs are not wh elements and for this reason, I did not include them in the data. However, we lack direct evidence of three syntactic positions, corresponding to three distinct features, being **filled** at the same time. Secondly, the assumption of two different wh positions, although an attractive solution in order to separate out (the spreading of) wh NMMs from the position of wh-signs, could be seen as an ad hoc proliferation of projections, made to force the analysis of sign language syntax into an antisymmetric framework. Thirdly, how can one locate these projections in LIS and NGT given that these have only wh NMMs, that is, suprasegmental information which spreads over strings of signs?

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[87] We will see later in this discussion whether the morpheme occupies the head or the specifier of this projection.

To be able to answer the first two questions, one should be able to observe languages where wh (lexical) marking, wh signs/words, and interrogative marking are all visible and all distinct from each other. In §4.1.3, it was shown that there are indeed some spoken languages where wh questions can have two visible wh positions, as in (197.b), (198.b), possibly filled by different lexical material. Crucially, in this case, wh questions also display both the initial-wh construction (197.a), (198.a) typical of Romance languages, which have [Spec;CP] on the left, and the final-wh construction (197.c), (198.c) observed also in LIS and NGT. The two distinct wh positions are highlighted in bold. Also, recall that neither the initial nor the final position is **in situ**.

197.

    a.   [Ven. sent-initial: rep. from (179.a)]

        (co)sa gało   magnà?

        what   have.3IND.PR-CLT.M.SG.INT. eaten

    b.   [Ven.Illasi: rep. from (179.b)]

        sa   alo   magnà **(che)**?

        what have.3IND.PR-CLT.M.SG.INT. eaten   (what)

    c.   [Ven. Bellunese: rep. from (179.c)]

        alo   magnà   **che** ?

        have.3IND.PR-CLT.M.SG.INT.   eaten   what

        'What did he eat?'

198.

    a.   [Ven. sentence-initial]

        ndo/**indove**   vało ?
        where   go.3IND.PR-CLT.M.SG.INT.
        'Where does he go?'

    b.   [Ven. Illasi: adapted from Poletto 2006a:10[88]]

        ndo   valo   **andóe** ?
        where   go.3IND.PR-CLT.M.SG.INT.   where
        'Where does he go?'

    c.   [Ven. Bellunese: adapted from Poletto & Pollock 2004a:253[89]]

        valo   (**a**)**ndé**?
        go-3IND.PR-CL.M.SG.INT.   where
        'Where does he go?'

The two different positions can be filled independently from one another in different varieties and can (but do not necessarily have to) host partially different material as shown, for instance, in (197.b) and (198.b). The forms *ndo* and *sa* never occur sentence finally, indeed, and are unstressed. The sentence-final position, in contrast, hosts stressed forms as *andoe* and *che*. Interestingly, the verb, which differs slightly depending on the variety (*alo*/*gało*), incorporates a postverbal clitic which is typical of **all** interrogative clauses [90] (although not only of

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[88] Poletto points out that these data are grammatical for the younger generation of Veneto speakers in Illasi, while the older generation only admits reduplication with *sa...che*. This difference shows that the use of reduplicated forms is spreading among the young, but this does not form an obstacle for Poletto & Pollock's analysis.

[89] Data originally from Munaro (1997), belonging to the Veneto variety of Tignes d'Alpago (prov. Belluno). Generally, the whole northern area of Veneto, i.e. the prov. of Belluno and part of Treviso, shows a final-wh pattern.

[90] The postverbal 3rd person masculine singular subject clitic –*lo* is different from the preverbal 3rd p.m.sg.clitic *el / l'*. In other words, the corresponding declarative sentences ('he ate X') would be: *el ga magnà X, l'à magnà X*. Also the 2nd person interrogative subject clitic –*to/tu* (*viento?* 'do you come?') is different from the 2nd person preverbal subject cilitic *te/ti* used in declarative clauses (*te/ti vien* 'you come'). Recall that interrogative clitics are optional when the subject is questioned (§4.1.3), but they are obligatory in all other interrogative clauses, polar questions included, throughout the region; only the eastern areas around Venice seem to prefer

interrogative clauses) because it occurs in both wh and yes/no questions, but not in plain declarative sentences. By comparing these data with data from French and different Northern Italian Dialects, Poletto & Pollock (2004a, 2004b) and Poletto (2006) explicitly argue for a universal Spec-Head-Compl deep structure with two wh-related functional projections, labelled WhPs (or operator phrases, OPs), which can be filled differently in different (varieties of) languages. Between these projections, they posit an additional projection which accounts for the interrogative verbal inversion with the postverbal clitic. In their analysis, the verb raises to this projection and appears thus between the two wh elements. We, thus, have evidence that at least three different syntactic positions are involved in the formation of wh-questions. Crucially, two of these positions host wh material. Consequently, there is evidence that languages allow for two lexically filled wh positions at the same time. The first question is thus answered.

More specifically, although Poletto & Pollock made use of quite a complicated sequence of movements to account also for the presence of auxiliaries and past participles, not observed in LIS and NGT, the fact that two wh positions can co-occur in one sentence (in addition to an interrogative position) suggests that not only in the visual modality, but also in spoken languages, there is a position for wh-marking, different from the one hosting specific wh-signs and different from the one where interrogativity is encoded. This is of great interest for the analysis of LIS and NGT data. The existence of final-wh and double-wh questions in Romance languages, which have a Spec-Head-Compl structure, is even more interesting because it means that these constructions are not necessarily evidence for specifiers and heads sitting to the right of the complements. Poletto & Pollock's analysis, indeed, assumes a universal Spec-Head-Compl structure where only leftward movement can occur. Also consider that the wh interrogative intonation is different from the yes/no intonation and is always present in wh questions regardless of the positions being lexically realized. A survey of the relations between syntax and prosody in Veneto lies outside the scope of this dissertation. However, although slight intonational differences exist among varieties, yes/no questions usually terminate with a raising/higher intonation as

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preverbal clitics also in interrogative contexts (*ti vol* '(do) you want'). Occasionally, however, forms with postverbal clitic (*vos-tu* 'want-you') can still be heard from older people in Venice.

compared to wh questions. The wh interrogative intonation is like the wh NMM which co-occurs with either an overt or a nonovert G-WH of which it is the prosodic effect (as proposed in the spirit of Aboh (2004) and Aboh & Pfau (2011)).

At this point, interesting similarities emerge between languages, under the previous assumption that the wh nonmanual marking is the nonlexical marking associated with the position of the G-WH, which is different from the position of SWHs and also different from the position of Q-PART. As an example, I list together some of the previous Veneto, NGT, and IPSL interrogative sentences where double-wh and final-wh constructions appear. Italics are mine and show how the two types of wh elements involved in wh questions are realized in the spoken, oral modality and in the signed, visual modality. The italics do not necessarily reflect the linear order of these elements. The linear order will be discussed later in this section. Between parentheses, it is specified whether the two wh elements of the sentence are lexical (*lex*), zero (*ø*), or accompanied by a NMM (*nonman*). For the moment, we observe the following similarities. First, in both the oral and the visual modality, all the sentences have some wh feature to mark, either lexically or not, given that all the sentences are wh questions. Secondly, besides one position for SWHs (and that of interrogative markers), both modalities provide an additional wh position that I will provisionally gloss 'wh-'. In (199.a), two wh positions are lexically filled, while in (199.c), the additional position is visible through the nonmanual (nonlexical) wh marker, which is the effect of a nonovert G-WH-like morpheme (Q-PART is not considered because it is interrogative, not wh). However, not all sentences display both wh positions overtly. In (199.b) the initial wh element is not phonetically realized. Also, (199.d) and (199.e) display only the lexical wh marker (the generic morpheme G-WH accompanied by a nonmanual component), but no overt SWHs. Thus, both modalities provide two wh positions in all sentences, although these are not always overt. Moreover, as we have seen, in both modalities, interrogativity may be encoded overtly on a distinct element, such as the optional sign Q-PART (in NGT) or the verb (in Vèneto). Here, I focus only on the two wh positions.

199.

    a.   **Sa** alo magnà (**che**)?   [Ven.Illasi: repeated from (179.b)]
         wh- (lex) + what (lex / ø)
         'What did he eat?'

    b.   Ø alo magnà **che**?   [Ven. BL: repeated from (179.c)]
         wh- (ø) + what (lex)
         'What did he eat?'

                                    wh
             ‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾‾
    c.   YESTERDAY IX$_2$ BUY **WHAT**   [NGT: cf. (175.b)]
         wh- (ø + nonman.) + what (lex)
         'What did you buy yesterday?'

       (‾‾‾‾‾‾‾) **wh.**   .
    d.   IX$_2$ AGE **G-WH**   [IPSL: Pfau 2006b:8]
         wh- (lex.+ nonman.) + what (ø.)
         'What is your age?'

       (‾‾‾‾‾‾‾‾‾‾‾‾‾) **wh**   .
    e.   IX$_2$ FRIEND SLEEP **G-WH**   [IPSL: Pfau 2006b:8]
         wh- (lex.+ nonman.) + where (ø)
         'Where does your friend sleep?'

The similarities observed suggest that one of the two wh positions is related to wh-ness (hence wh lexical and/or nonmanual marking), in both spoken and sign languages. Given this, it is attractive to assume that wh marking is related to one and the same structural position across both modalities, although languages vary as to which slots can be filled lexically and which lexical material is employed. Also, notice that two wh positions can be filled lexically in both spoken and sign languages. This availability of two wh related lexical positions (in addition to interrogativity) accounts straightforwardly for double-wh constructions. It is sufficient to posit that one wh projection is able to host a copy of the element contained in the second wh projection, instead of being lexically empty or filled by a generic G-WH. In fact, as pointed out in §4.1.3, double-wh constructions with two identical wh elements are not peculiar

to the visual modality, but occur also in spoken languages. Compare (177), repeated as (200.a), and (180.b), repeated here as (200.b):

200.

a.   <u>   **wh**   </u>   [NGT: rep. from (177)]
    WHO BOOK STEAL **WHO**
    'Who steals the book?'

b.   [Ven.Verona: rep. from (180.b)]
    Ci   èlo   **ci**?
    who   be-3IND.PR-SB.CLT.M.SG.INT. who?
    'Who is he?'

Initial-wh constructions as (178), (179.a), and (180.a) are then analyzed as having the final position not lexically realized. These data mean that what I have labelled SWHs may actually occur in two instances, either as a SWH proper or as a sign homophonous to the SWH in place of the generic G-WH (that optionally accompanies the wh NMM). I will discuss this later. For the moment, the availability of two lexically filled wh positions in both the spoken and the visual modality allows us to conclude that assuming two wh-related positions to separate out the wh NMM from the distribution of wh signs is not an ad-hoc hypothesis. The second question is thus answered.

The issue is now which projection in the structure is associated with the additional wh position, given that wh marking has a dedicated projection, different from both the position of SWHs and from the position of interrogative marking (i.e. interrogative-marked verbs or interrogative particles, *ga*, *ka*, Q-PART). The problem is complicated by the fact that the examples display different linear orders, so that it is not easy to relate the different surface orders to one deep structure. At this point, locating the position of wh marking amounts to determining which of the two wh positions lexically visible in (199.a), (200.a), and (200.b) corresponds to the position of the wh NMM and the G-WH (if any). This immediately leads us back to the third question, as to how a projection in sign languages can be identified if its content surfaces in the sentence only as a suprasegmental feature, that is, as a nonmanual marker which makes the linear ordering of signs less clear. In this case, crosslinguistic variation brings only partial insight because some information is not

encoded lexically. For instance, LIS and NGT usually have lexical SWHs, but they do not co-occur with any G-WH-like lexical wh marker (remember that the Q-PART of NGT cannot be taken as the counterpart of G-WH). IPSL has a clearly lexical sentence-final G-WH (accompanied by a nonmanual component), but this sign does not co-occur with any SWHs. Finally, NGT does show two co-occurring wh-positions on some occasions, but these are filled with homophonous lexical elements (for example, the same SWH WHO). Consequently, it is not possible to determine which position is reserved for SWHs proper and which position is related to the wh marker, i.e. the wh NMM and/or G-WH (possibly replaced by a copy of the SWH).

However, the analysis can profit from the fact that in some languages the two wh positions can also host different SWHs, as *sa* vs. *che* in (199.a) = (197.b) and *ndo* vs *andóe* in (198.b). The distinct treatments of these SWHs in spoken languages provide a basis for the analysis of sign languages. We can thus start the analysis by observing the behaviour of SWHs and the way they have been analyzed in some studies on spoken and sign languages. What appears clear from crosslinguistic and intralinguistic data is that the sentence final SWHs of LIS and NGT occupy a position different from their *in situ* position inside IP, from the position of interrogative particles, and from the position of possible wh markers. SWHs are usually taken to be wh-phrases in a focus projection (see Rizzi 1997; Aboh 2004a; Lipták 2001), although Aboh & Pfau (2011) argue that focusing is not necessarily involved in all languages. Poletto & Pollock (2004a/b) and Munaro & Pollock (2005) mention different WhP*s* or operator projections without going into any detail about focus, though the existence of wh-phrases is assumed. Since in this dissertation, I do not have enough data about NGT and LIS to distinguish focus positions from other projections, I will follow the general assumption that usually[91] SWHs are wh-phrases in focus (except in-situ SWHs, which remain in their argumental position). I leave a deeper investigation of nonfocalized wh elements for future research[92].

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[91] As argued later in this section, what I provisionally label "SWHs" (signs or words meaning 'who, what, where' and so on) are not always wh-phrases.

[92] Even though one takes wh signs to be without focus features, it seems to me that in any case, they imply at least some kind of contrast. In this light, it would be possible to analyze specific wh-signs as sitting in ContrP rather that in FocP (for an autonomous ContrP, see Frascarelli & Puglielli (2007), whose proposal is recalled

Notice that the focus projection is lower than the projection where interrogativity is encoded. This allows Aboh & Pfau (2011) to claim that both focalized and nonfocalized wh-signs (or words) are wh-phrases located lower than interrogative particles in the structure. In Aboh & Pfau (2011), nonfocalized elements are in situ within FinP/IP, hence lower than InterP. Focalized elements raise to FocP, but they are still lower than InterP because FocP is lower than InterP in Rizzi's hierarchy. In both cases, further raisings strand the interrogative particle in Inter° in clause final position. Thus, both focalized and nonfocalized elements come to precede the interrogative particle in the surface order, although with slightly different linear positions. Assuming that FocP is lower than InterP is also consistent with the distribution of wh elements in Veneto, which are able to follow the interrogative verb. Thus, one position occupied by SWHs is a focus position.

As for the other wh position, which I am relating to lexical and nonmanual wh markers (possibly homophonous to SWHs, if any), Poletto & Pollock (2004b) and Poletto (2006) extend to double-wh constructions the analysis of pronominal clitic doubling. They convincingly argue that clause-initial phonologically reduced forms *sa* (197), (199), *ndo* (198), and also French *que* are wh clitics which occupy the head of a projection higher than the projection which hosts clause-final wh-phrases. At this point, it is certainly not easy to tell at first sight if sign languages have wh clitics at their disposal and a study on (possible) clitics in sign languages is beyond the scope of this dissertation. Nevertheless, Poletto & Pollock's (2004b) observations and hypotheses about Romance languages show some interesting similarities with Aboh, Pfau and Zeshan's (2005) analysis of sign languages (later refined in Aboh & Pfau (2011)). Especially, the fact that both Poletto & Pollock's and Aboh & Pfau's analyses rely on the assumption of some head-like wh-element structurally higher than the projection of wh-phrases (which SWHs usually are), sheds some light also on the spreading of wh NMMs in LIS and NGT, which is apparently difficult to predict in an antisymmetric framework. Notice, at this point, that the NMM spreads over the whole sentence in many examples. This proves, in my opinion, that for the

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briefly also in §5.2.3). The nature of the projection, however, does not impede the analysis, which is based simply on the number of structural projections, one of which is assumed to be specific for final SWHs, and on their position with respect to the interrogative projection.

NMM, the clause is acting as a whole constituent. Aboh & Pfau (2011) do indeed propose that the clause moves to [Spec;InterP] whose head Inter° hosts Q-PART or G-WH, and assigns the NMM to the specifier. That wh questions involve head wh elements is thus a fair assumption, and this correctly predicts the spreading of the NMM. Yet, as already mentioned, G-WH is strictly related to wh marking (also wh NMM) unlike Q-PART, which is purely interrogative and neutral with respect to the NMM.

Thus, Aboh & Pfau's analysis is on the right track in arguing that wh questions are marked independently of the presence of SWHs, possibly by a head element, but, in my opinion, it cannot capture the fact that the wh feature of wh questions (related to the wh NMM) is also distinct from interrogativity. Their analysis, however, can be refined in light of Poletto & Pollock's (2004a/b) observation that one interrogative and two wh projections co-occur in wh questions, with the higher wh projection hosting head wh elements. This opens up the possibility that G-WH (or the zero morpheme) that accompanies the wh NMM is a head distinct from the Inter° which hosts Q-PART. Accordingly, the wh NMM would be assigned in the specifier of a projection different from InterP. Thus, Poletto & Pollock's observation meets both the claim that G-WH is a head and also the previous hypothesis that the wh NMM and G-WH occupy a dedicated projection (different from InterP, as well as from the position where SWHs usually occur).

In this light, I would like to pursue an hypothesis I already proposed in Brunelli (2007). There, I assumed a split-CP structure very similar to a simplified version of Poletto & Pollock's (2004b)[93] scheme and I also took the higher wh projection (WhP) to be the position where wh-marking occurs under spec-head agreement, while assuming the final SWHs to be wh phrases located in FocP (following the general assumption that wh-phrases bear focus features). I also assumed an interrogative projection positioned between the WhP and FocP. This corresponds to Poletto & Pollock's and Munaro & Pollock's analyses,

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[93] Poletto & Pollock's (2004) structure is made of at least three projections: a higher WhP, ForceP (interrogativity), and a lower WhP. Here, I will assume interrogativity to be encoded in InterP, following Rizzi (2001) and Aboh & Pfau (2011). What is relevant is the fact that the projection of interrogativity is always positioned between a lower wh projection and a higher wh projection and is not the highest projection in the split-CP. The name chosen for the projection, thus, does not affect the process of derivation of wh questions described here.

according to which the higher WhP must be above the projection for interrogativity. It also matches Rizzi's assumption of an interrogative projection above FocP. Here, then, I will follow Aboh & Pfau (2011) in assuming that Q-PART occupies Inter° and that G-WH is a head, but in contrast to their account, I propose that G-WH sits in Wh° which also assigns the NMM to [Spec;WhP]. In other words, G-WH is a head higher than Q-PART and the wh NMM is assigned above Q-PART.

In addition to this, I will also follow Poletto & Pollock in assuming a TopP projection, which Aboh & Pfau invoked also for IPSL together with a FocP reserved for wh-phrases. If we take the higher projection WhP to be the place where wh-marking is encoded, then we can account for the fact that LIS and NGT interrogative clauses often bear a clause-long wh NMM by assuming that the whole clause moves to the specifier (on the left) of this WhP. While in Veneto the wh-feature can be encoded lexically by a clitic in Wh°, LIS and NGT do not have such an overt head and are forced to encode the feature by filling [Spec;WhP]. This happens by leftward movement of the whole InterP (containing FocP and TopP) and yields the NMM spreading on the whole sentence. In contrast, the IPSL clause-final generic wh lexical marker G-WH can be accounted for in this antisymmetric model by positing that G-WH spells out the head Wh°, of which the specifier [Spec;WhP] is filled through leftward pied-piping of the clause containing a silent SWH (again producing NMM spreading). Leftward raising to [Spec;WhP] would thus occur in IPSL just as in LIS and NGT, with IPSL having also Wh° filled. As for the NGT lexical interrogative marker Q-PART, it can be assumed that the clause raises to [Spec;InterP] as in Aboh & Pfau (2011), before InterP moves further to [Spec;WhP].

To sum up, the only difference between Aboh & Pfau's (2011) proposal and the present account is that here G-WH sits in Wh° rather than in Inter° (because G-WH is specifically related to wh questions, unlike "purely" interrogative markers hosted in Inter°). Consequently, Aboh & Pfau's movement to the left of G-WH is a leftward raising to [Spec;WhP], rather than to [Spec;InterP] (movement to [Spec;InterP] occurring for independent reasons).

WhP being higher than InterP accounts for the fact that the interrogative marker Q-PART, although sitting in Inter°, receives the wh NMM. It also accounts for the fact that this happens only when a wh question is built. If Q-PART were higher than WhP, it could not raise to
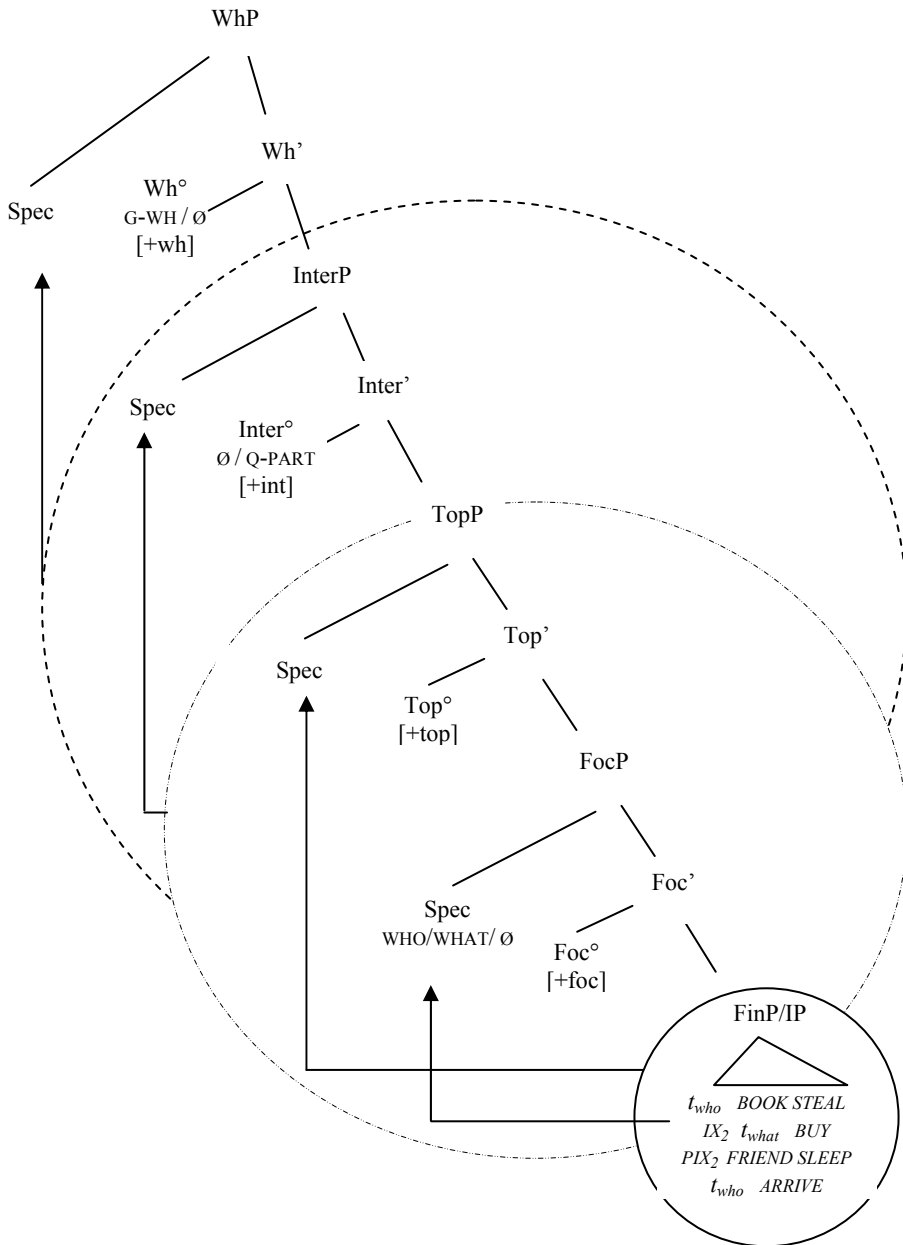
[Spec;WhP] and would never fall under the wh NMM. If WhP did not exist (or if Q-PART occupied Wh°), the wh NMM and Q-PART would come to occupy the specifier and the head of the same projection (either both in InterP or both in WhP). Consequently, the head Q-PART would always co-occur with the wh NMM, given that NMMs are assigned under spec-head agreement[94]. Thus, according to the present hypothesis, LIS, NGT and IPSL behave in basically the same way with only two differences. First, IPSL has an overt wh lexical head G-WH and nonovert SWHs, while LIS and NGT have overt SWHs, but no lexical G-WH marker. Second, NGT has an overt interrogative lexical head Q-PART, which LIS and IPSL do not have. The formation of wh-questions is thus realized through the following steps, which are required to encode interrogativity, the kind of interrogativity (here wh-ness), and the questioned element.

First the questioned element (i.e. the SWH which is a wh-phrase), if present, is moved leftward to [Spec;FocP] and then the remnant clause FinP/IP moves further leftward to [Spec;TopP]. This creates a relation of prominence between the questioned element and the rest of the clause, while the inversion yields the clause-final position of the SWH. Subsequently, the whole complex raises to [Spec;InterP] where it is marked as an interrogative clause under spec-head agreement with Inter°. If an element (e.g. Q-PART) occupies Inter°, it is stranded in final position. Finally, InterP (containing TopP and FocP) moves to [Spec;WhP] where the interrogative question is marked as one of the wh-type; this accounts for the fact that the whole clause, including possible interrogative particles, acts as one constituent (see 201) with respect to the wh NMM, which can spread across the whole string of signs. A lexical wh marker (e.g. G-WH) in Wh° surfaces clause-finally. This derivation accounts for the fact that both Q-PART and G-WH, though different from one other, follow the final SWH (if any). It also predicts that, if one of the sign languages investigated had both a lexical wh marker and a lexical interrogative marker, the wh marker should follow the interrogative one. Admittedly, Q-PART and G-WH do not occur in the same language. However, their behaviours and distribution (Q-PART in all questions, patterning with interrogative markers; G-WH only in wh questions, patterning with wh (nonmanual) markers) and the distribution of the wh

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[94] Unless one hypothesizes that two homophonous Q-PARTs exist, one associated with the wh NMM and the other associated with the yes/no NMM.

NMM still suggest the universal deep structure represented in figure (201) with the four derivational leftward movements mentioned above. A leftward movement raises the SWH to [Spec;FocP]. A remnant movement raises the rest of the clause further leftwards, to [Spec;TopP]. A subsequent leftward movement raises everything to [Spec;InterP]. A final leftward movement raises InterP further leftwards to [Spec;WhP]. By way of example, figure (201) illustrates the formation of LIS (176.a) and NGT (176.b), which contain a clause-final SWH, of NGT (175.a), which contains SWH and Q-PART, and of IPSL (195.b), which contains only G-WH. Figure (201) also includes the derivation of LIS final-wh clause (202.a), which is described in the next pages and contrasted with LIS in-situ-wh clauses and NGT double-wh clauses.

201. Formation of wh interrogative clauses requires three different syntactic positions

WhP

Spec

Wh'

Wh°
G-WH / Ø
[+wh]

InterP

Spec

Inter'

Inter°
Ø / Q-PART
[+int]

TopP

Spec

Top'

Top°
[+top]

FocP

Spec
WHO/WHAT/ Ø

Foc'

Foc°
[+foc]

FinP/IP

t_{who} BOOK STEAL
IX$_2$ t_{what} BUY
PIX$_2$ FRIEND SLEEP
t_{who} ARRIVE

Interestingly, if no element moves to FocP, as Aboh & Pfau (2011) propose for some IPSL sentences (or alternatively, if the whole clause were assumed to raise to FocP), the subsequent two raisings, to InterP and WhP, will still yield a wh interrogative clause marked by a clause-long NMM, but the order of elements will be partially different because the SWH will be really in situ. By "really in situ", I mean that the wh sign occupies the same argument position that it would occupy in the corresponding declarative sentence. It is different from wh elements which are sometimes called "in situ wh", but which Poletto & Pollock have shown not to be in situ (see the discussion of examples (179.a)–(179.c), (180.a)–(180.c), and (181.a), (181.b)). In LIS and NGT, for instance, a subject wh should be the first sign (*Swh*OV) and an object wh should be positioned between subject and verb (S*Owh*V). Accordingly, in SVO languages, the questioned object should appear after the verb (SV*Owh*), but before other signs. Although I do not have data about NGT, this prediction appears valid for the variation in LIS sentences (202.a), (202.b)[95], as well as for the variation in ASL sentences (203.a), (203.b). In LIS (202.b), the subject wh is able to precede the verb, as an alternative to the more common clause-final position shown in (202.a).

202.

    a.   ARRIVE WHO?   [LIS]
          'Who arrived?'

    b.   WHO ARRIVE?   [LIS: Cecchetto et al. 2004b: ex. nr. 36]
          'Which of them arrived?'

ASL, unlike LIS, is an SVO language and the object wh may indeed appear in situ, as predicted, between the verb and the adverb (203.b), besides the typical interrogative clause-final position (203.a):

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[95] The authors provide no gloss of the nonmanual marker.

203.   [ASL: Neidle et al. 2000:111]

     a.   _wh_

         TEACHER LIPREAD YESTERDAY WHO

     b.   _wh_

         TEACHER LIPREAD WHO YESTERDAY

         'What did John buy yesterday?'

I do not discuss ASL in any detail in this dissertation[96], but notice incidentally that this hypothesis also predicts that *in situ* questioned subjects appear clause initally, while in situ questioned objects cannot, although both can be clause-final when they are not in situ. In fact, in (204.a) the subject is clause-initial, while, according to Neidle et al. (2000), the clause-initial object in (204.b) is ungrammatical.

204.   _wh_   [ASL: Neidle et al. 2000:110]

     a.   WHO LOVE JOHN

         'Who loves John?'

                _wh_

     b.   *WHO JOHN LOVE

         'Who does John love?'

The raising movement without focalization of the wh element also accounts for double-wh constructions in NGT. Recall from (200) that the two wh positions (corresponding to FocP and WhP) can host the same lexical material, but they are not contiguous (e.g. *ci èlo ci*). As previously said, Poletto shows that these constructions involve a clitic in the head Wh° of the higher projection: such wh clitics are the clitic counterpart of wh-phrases. In fact, in this position, unstressed forms (*sa, ndo, ci*) appear, which cannot occur clause-finally. These forms are often phonologically reduced. Repetition of the base form is not excluded if the word is monosyllabic (e.g. *ci* 'who' is always short), but only in final position can

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[96] Also recall the debate about some ASL data (Neidle et al. 2000; Petronio & Lillo-Martin 1997).

the wh-element be pronounced with stress[97]. Phonological reduction and impossibility of receiving stress are typical features of clitics. The fact that in spoken languages, the higher head Wh° can be filled with wh clitics, possibly phonologically similar to wh-phrases, but unstressed and shorter, is of special interest for our analysis. The Romance languages analyzed by Poletto, Pollock, and Munaro lack a general G-WH word in Wh°, but can fill Wh° with clitic versions of specific wh-words[98]. Since NGT, too, lacks a general G-WH head to fill the Wh° position, it is quite possible that it has developed or is developing some other head element(s) which cover(s) this function, besides exploiting the remnant movement to [Spec;WhP]. From this perspective, NGT would thus be not very different from IPSL. Crucially, while IPSL has a G-WH in Wh° and assigns the clause-long wh NMM to the remnant under spec-head agreement in [Spec;WhP], NGT (200.a) would have a *ci*-like element in Wh° again assigning the clause-long wh NMM to the remnant in [Spec;WhP].

The hypothesis of wh clitics sitting in Wh° entails that not all SWHs are wh phrases. Rather, specific wh signs or words (meaning 'who, where, what' and so on) can also be wh heads in both spoken languages and sign languages. This may appear as an ad-hoc assumption, but in fact, it is not very different from the observation that personal pronouns can have also a clitic version in some languages.

At this point, however, the fact that in (200.a) the wh NMM can spread over the whole clause also in double-wh constructions of NGT appears to be a major problem. The problem with this proposal lies in the
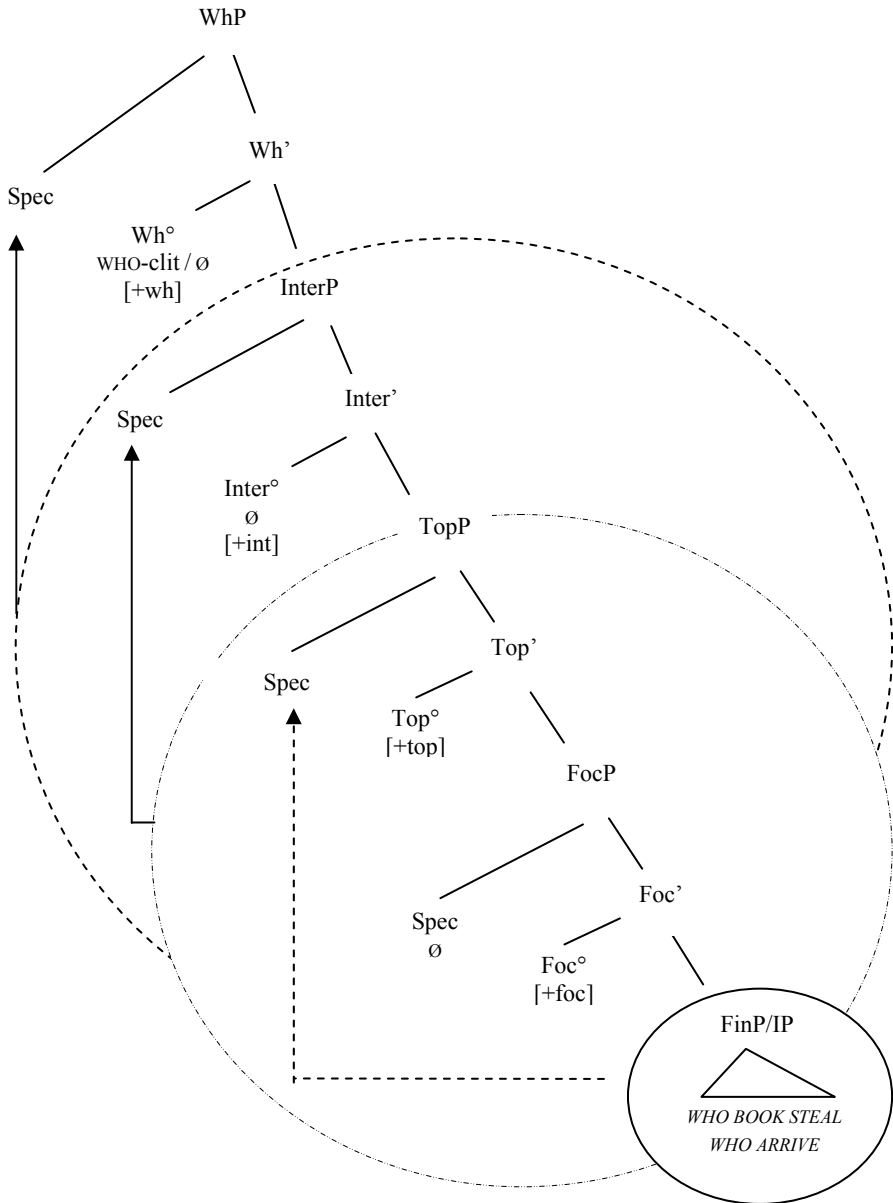
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[97] The stress, represented here by underscore, is on the second wh (*ci èlo ci* , or possibly on the verb *ci èlo* without doubling), but not on the first wh (**ci èlo ci, *ci èlo*). Also the final interrogative *che* is stressed with respect to the homophonous complementizer *che*. For instance in Ven. Bellunese, forms like *èlo che che te disturba?* 'What is it that disturbs you?' (lit. 'is it what that...?' in Munaro & Pollock 2005) are pronounced with the stress on the postverbal wh element (*èlo che che...)* and not on the complementizer (**èlo che che...)*

[98] Notice, however, that under certain cirumstances and in some varieties of Veneto, the particle *'sa* ('what') can function as a general wh marker, which replaces specific wh phrases *quanto* ('how much') and *come* ('how'). See, for instance, *'sa còsteło / quanto còsteło* ('how much does it cost?') and *'sa te ciàmito / come te ciàmito* ('what is your name?'; lit. 'how do you call yourself'?). This observation holds partially also of "sloppy" regional Italian *cosa costa?* (used in Veneto), although **cosa ti chiami* is ungrammatical.

fact that in IPSL, there is just one clause-final G-WH, whereas NGT (200.a) has both a final and an initial element. Thus, the clause-final position of G-WH and the spreading of the wh NMM in IPSL are not in contradiction, but the clause-initial position of the wh element does contradict the spreading of the wh NMM in NGT in the following way. On the one hand, the NMM on the whole NGT clause shows that there is movement to [Spec;WhP] which strands the particle clause finally in Wh°, but, at the same time, the other leftward movements (to FocP and TopP) seen above should also strand the SWH clause-finally in [Spec;FocP]. In other words, one should observe a "… *WHO WHO" sequence with two clause-final wh signs. On the other hand, if no movement to [Spec;WhP] occurred, one would expect the wh NMM to occur only on the initial element (in Wh°), but not on the rest of the clause (because this would remain outside WhP). The NGT sentence (200.a) apparently contradicts the present proposal because it displays both a clause-long wh NMM and also an initial SWH.

However, (200.a) can be derived if we assume that a movement to [Spec;WhP] occurs in (200.a), as in LIS (202.b) and ASL (204.a), but without previous focalization of the wh phrase. This movement raises the clause to [Spec;WhP] with the in situ wh sign, so that the wh element in Wh° is stranded clause-finally and the in situ subject wh sign remains clause-initial. NGT sentences with optional double wh as (200.a) are thus accounted for assuming that raisings to InterP and WhP occur without previous extraction to FocP, as represented in figure (205). The optionality proceeds from the fact that Wh° may be not filled, in which case only the in situ subject wh element is visible before the verb. LIS sentences with in situ subject wh as (202.b) are derived along the same lines. The difference between NGT (200.a) and LIS (202.b) is due to the fact that NGT allows (but does not require) to fill Wh° with a clitic, while LIS has no clitic wh at all to fill Wh°. Hence in LIS no reduplication appears. The NMM, however, always spreads on the whole clause because this has moved to [Spec;WhP] in both languages. LIS (202.b) is then a subcase of NGT (200.a). Observe the two derivations in (205).

205. Formation of interrogative clauses with in situ wh (and possible double-wh)

WhP

Wh'

Spec

Wh°
WHO-clit / ∅
[+wh]

InterP

Spec

Inter'

Inter°
∅
[+int]

TopP

Spec

Top'

Top°
[+top]

FocP

Spec
∅

Foc'

Foc°
[+foc]

FinP/IP

WHO BOOK STEAL
WHO ARRIVE

In contrast to in situ wh subjects, a wh element in [Spec;WhP] prevents the sentence from receiving the wh NMM. If some wh element (a wh phrase) moves to [Spec;WhP], it is clause-initial, but it blocks the remnant movement of the clause. In this case, the clause remains lower, possibly in InterP, and only the wh sign in [Spec;WhP] falls under the wh NMM. The same happens if Wh° is lexically filled without pied-piping to [Spec;WhP], as Poletto & Pollock propose for cases like (199.a). This is borne out in (178) repeated as (206) below, provided that the lower wh position is not lexically filled.

206. $\overline{\text{wh.}}$
     WHAT IX$_1$ t LIKE IX$_1$ [NGT: repeated from (178)]
      'What do I like?'

The present analysis also makes two interesting predictions. First, double-wh questions are possible with a wh-phrase in FocP and clitic-wh in Wh°, but if a language has only one general wh marker (head in Wh°), it should not display double-wh constructions (because nothing sits in [Spec;FocP]) nor in situ wh-particles (only phrases, such as wh-phrases or DPs, can occupy an argumental position[99]). Secondly, because double-wh questions involve a clitic in Wh°, it is not possible to build double-wh constructions by reduplicating wh phrases (phrases cannot sit in heads). Both predictions are borne out, as shown in (207.a), (207.b), and (207.c). On the one hand, IPSL has only one general wh marker head G-WH and does not allow double-wh questions as (207.a) nor in situ wh particles as in (207.b). On the other hand, LIS has complex wh-phrases, but does not allow these to be reduplicated as shown by the ungrammaticality of (207.c). In (207.c) one of the two BOY-WHICH should be a head, but this is not possible.

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[99] For instance, in Italian, clitics occupy a different position than DPs:
1. Vedo un cane   *vs*. Lo vedo   *vs*. *Vedo lo
     'I see a dog'   *vs*. 'It-*cl* I see'   *vs*. '*I see it-*cl*.'

207.

    a.   [IPSL: adapted from Pfau 2005b:5]
        *G-WH FATHER IX SEARCH G-WH

    b.   [IPSL: adapted from Pfau 2005b:5]
        *FATHER IX G-WH SEARCH
        'What was/is father searching?'

    c.   [LIS: Cecchetto et al. 2004: ex. nr. 20]
        *BOY-WHICH BOOK STEAL BOY-WHICH
        'Which boy stole the book?'

At this point recall that complex wh-phrases can occur in a split form, at least in LIS, with the wh element in clause-final position, as usual, and an in situ NP as in (182.c). On the basis of the proposed extraction of wh elements to FocP, these constructions can be derived by focalization of the wh element alone, while the in situ NP raises with remnant movement as part of the remaining interrogative clause. In contrast, if WH+NP focalize together, the remnant movement strands the whole complex wh-phrase clause-finally as in (182.a) while, if no focalization occurs at all, the whole wh-phrase occurs in situ as in (182.b). Thus, languages vary as to the extent to which movement applies and as to which mechanism they employ to fill projections: lexical material in the head, lexical material in the Spec, no lexical material (but only nonmanual features), or both filling the head and raising to Spec. As a consequence, prosodic spreading associated with feature marking, as for instance NMMs in sign languages, is affected by the type and the position of the lexical material, but does not depend directly on the wh phrase. Accordingly, there may be crosslinguistic (and also intralinguistic) variation with respect to the relation between NMM spreading and linear order in wh questions.

    Yet, natural languages, both in the oral and in the visual modality, can be assumed to have universally the same projections because they encode features necessary to build up a wh question in any language: the fact that a sentence is interrogative (not declarative), the fact that this interrogative is of the wh type (not polar), and finally, the need for specifying the questioned element. This hypothesis provides a unified account for the attested crosslinguistic and crossmodal variation, thus

accounting for phenomena (wh-questions) which have traditionally been explained using two different deep phrase structures: many sign languages would have a [Spec;CP] on the right whereas most spoken languages would have [Spec;CP] on the left. Moreover, the proposal put forward here offers a unified solution for some striking similarities (double-wh constructions and final-wh constructions) between languages which under previous proposals were structurally different. It also accounts for the observed intralinguistic variation in different ways. It relates different spreadings of the wh nonmanual markers to distinct positions and statuses (phrase/head) of the wh signs. Rather than ruling out constructions that have been attested, it predicts that they occur only under certain conditions, which depend on the parametrical setting of each language and also involve differences in the spreading of NMMs. It rules out only those constructions that show a basic, structural incompatibility as in, for instance, (207.a)–(207.c). In addition to this, it gives an answer to the otherwise puzzling observation that in the sign languages investigated here, wh-questions appear to be the only "rightward movement" phenomenon among CP-related constructions, which generally conform to leftward movement (topicalization, imperatives, yes/no questions, and, as will become clear in chapter 5, conditional clauses).

Finally, the fact that the proposal relies on observations made on both spoken languages and sign languages should make clear that it is not just a subterfuge to impose antisymmetry on sign languages, but rather a tool to capture really universal features which play a role in all languages, crossmodally. Notice, incidentally, that LIS has some relative clauses that apparently involve rightward movement, but, crucially, also has other relative clauses, which are compatible with leftward movement. In chapter 5, we shall see that both types of LIS relative clauses can be derived with a unified account based on an antisymmetric phrase structure similar to the one proposed for wh interrogative clauses.

4.2.4 Structure and movement in yes/no questions

In the light of what has been suggested in the previous sections, yes/no questions do not pose a problem for the present analysis. As was shown in §4.1.2, they go together with a "raised eyebrows" NMM, unlike wh questions, and in NGT, they optionally display the same Q-PART sign that may also occur in wh questions. As they are interrogative clauses, a

raising to InterP is entailed along the lines of Rizzi's split-CP and in the spirit of Aboh & Pfau (2011). As for the yes/no NMM, two explanations are possible. It can be taken as the overt manifestation of the interrogative feature that is encoded in Inter°. In this case, it is possibly overridden by the wh question NMM "furrowed eyebrows" which, according to the analysis in §4.2.3, is assigned in the higher wh projection. Alternatively, if one focuses on the fact that the yes/no NMM is the polar counterpart of the wh NMM, that is, the two NMMs are in complementary distribution, it follows that they are encoded in the same projection. In other words, the yes/no NMM is encoded in a projection different from InterP, namely in the one where "wh-ness" is encoded (see §4.2.3). At first sight, it may appear counter-intuitive to state that yes/no questions have to encode some feature in a projection dedicated to wh-ness. Indeed, although both wh and polar questions have an interrogative feature, they seem to be different, given that yes/no questions have no wh-like feature. The very fact that they are usually classified separately (wh vs. polar) suggests that they are different. Yet, the idea that yes/no questions are very similar to wh questions dates back to Katz & Postal (1964), who observed a strong parallelism between English yes/no and wh embedded questions.

	When	
208. I noticed ...	Where he went	[adapt. from Katz & Postal 1964:95]
	Whether	

In fact, the word 'whether' itself contains a 'wh' part exactly as other English wh-elements do. From a preliminary observation, the difference between whether-questions and other wh-questions lies in that the latter ask about arguments (subject, object, locative and time complements, etc.), whereas the former ask about the truth value of the sentence. In Katz & Postal's words:

> «[...] yes-no questions or simple truth-value questions are also wh-questions. They are naturally regarded as wh-questions in which the constituent 'questioned' is the Sentence Adverbial.» (1964:95)

Notice that in modern English, *whether* is only used in embedded yes/no questions, but in the past, it also occurred in root interrogative clauses (Katz & Postal 1964:97). This means that what is usually called a yes/no

question is in fact just a special kind of wh-question, where the variable is restricted to range over the Boolean set of values {yes=true, no=false}. In other words, there are two different "wh-type" markings, rather than wh marking vs. yes/no marking. That yes/no questions are not completely unrelated to (other) wh questions is also suggested by the existence, in some languages, of constructions comparable to Italian (209), where a wh element *cosa* ('what') appears in the first part which clearly refers to the yes/no particle(s) of the second part (relevant elements are in bold).

209. **Cosa** hai risposto? **Si** o **no**?   [Ital.]
       'What did you answer? Yes or no?'

In light of this, it is not surprising that, besides an interrogative projection which distinguishes interrogative clauses from declarative clauses, languages also have a projection where "standard" (i.e. open) wh-questions are distinguished from Boolean (i.e. closed, yes/no) wh-questions. This makes yes/no interrogative clauses very similar to other wh interrogative clauses because both have an InterP to mark interrogativity, and also a WhP to mark the kind of interrogativity. At this point, however, if one maintains this parallelism between (standard) wh interrogative clauses and Boolean (yes/no) interrogative clauses, two questions arise. First, one may wonder what element occupies FocP in a yes/no question. If yes/no questions are interrogative clauses in which the questioned constituent is the Sentence Adverbial, then there is no apparent reason for a FocP specifying the questioned constituent. In fact, in open wh questions, FocP is taken to give prominence to the questioned variable (e.g. the subject, the object, the temporal or the locative argument), as proposed in §4.2.3, but in yes/no questions, this should automatically be the truth-value of the sentence, so there is no need to focus on any element. Secondly, if yes/no questions are also a kind of wh question, one may also wonder why yes/no interrogative clauses need to be marked differently from all other wh interrogative clauses. This issue is also related to the nature of the features encoded by the WhP discussed in §4.2.3. To answer the first question, the English examples in (210) are relevant.

210.

    a.   Are you playing with *Anthony*?
        No, (I am playing) with Susy

    b.   Are you *playing* with Anthony?
        No, I am working (with him)

In both these examples, the answer is 'no' but it is related to different elements. Both question-answer pairs in (210) involve a truth-value, but in (210.a), this depends on the object (Anthony=no, Susy=yes) while in (210.b), it depends on the verb (playing=no, doing something else=yes). More precisely, although the whole sentence is a question (it asks for information), only the object 'Anthony' is questioned in (210.a) and only the verb is questioned in (210.b). Thus, yes/no questions, too, require the specification of the constituent on which the answer depends. Crucially, in other languages, these differences in meaning involve different word orders. The grammaticality judgements of some Sardinian[100] informants indicate that the element on which the yes/no questions (211.a)–(211.c) depend is fronted in much the same way as wh elements are fronted in open wh-questions like (211.d). The fronted constituents are in italics.

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[100] The Sardinian variety is the one spoken in Baunei and Santa Maria Navarrese, on the central-eastern coast of Sardinia in the province of Ogliastra.

211.

  a.   [Sard.Baunese]

   Giogando ses chin Antoni? – No, soe allegando
   Lit. '*Playing* are (you) with Anthony? – No, I am speaking (to
   him)'

  b.   [Sard.Baunese]

   Chin Antoni ses giogando?   – No, chin Susanna
   Lit. '*With Anthony* are (you) playing? – No, with Susanna'

  c.   [Sard.Baunese]

   Giogando chin Antoni sese? – No, soe allegando chin Mariu'
   Lit. '*Playing with Anthony* are (you)? – No, I am speaking with
   Mario'

  d.   [Sard.Baunese]

   Chin chine ses giogando? – Soe giogando chin Antoni/Mariu/
   Susanna'
   Lit. '*With whom* are (you) playing? – I am playing with Anthony/
   Mario/Susanna'

This strongly suggests that also yes/no questions require some constituent
(e.g. the verb, the complement, or both) to be in FocP as wh questions do.
In other languages, the surface order of elements does not change
apparently, but different lexical forms are used to focus on the word on
which the answer depends; see Dutch examples (212.a)–(212.c), for
instance, where stressed forms are in italics.

212.

  a. *Ga* je bodschappen doen? (of ga je niet?)
   'Are you going shopping? (or are you not going?)'

  b. Ga **je* bodschappen doen? (of gaat iemand anders?)

  c. Ga *jij* bodschappen doen? (of gaat iemand anders?)
   'Are *you* going shopping? (or is somebody else going?)'

The pronoun 'you' has two forms: *jij* and *je*. Only the pronoun *jij* can receive focus stress as in (212.c), whereas *je* cannot, as shown by the ungrammaticality of (212.b). If *je* is used, the stress falls on other elements, for instance on the verb, as in (212.a). Depending on which element is focalized, the yes/no question has different meanings and may trigger partially different answers. The parallelism between open wh questions and yes/no wh questions is thus not only maintained for theory-internal reasons, but is also motivated by the fact that both kinds of questions require a projection marking the clause as interrogative (InterP) and a projection which gives prominence to the constituent relevant for the question (FocP). The difference is that in open wh-questions, the focused element is also the questioned element, whereas in yes/no (wh-) questions, the focused element is distinct from the questioned one (always the truth value). Yet, this leads to the second issue, as to whether a third projection (WhP) is really necessary to distinguish yes/no questions from all other wh questions, if yes/no questions are **also** wh questions. In other words, this amounts to asking which is the relevant feature triggering (and motivating) the different marking of yes/no questions as compared to wh questions.

My answer here is more tentative. One possibility is that the different marking of yes/no as compared to other wh questions is related to the fundamental difference seen above. Only in open wh questions, the focused element is also the questioned one. On the one hand, open wh questions propose a sentence with a variable (e.g. *Gianni eats x*) and a truth value for that sentence (*[Gianni eats x] = yes* or *[Gianni eats x] = no*) and ask for which value of the relevant (questioned) variable the answer gets the same truth value as that proposed by the speaker (e.g. positive questions, *which x* such that *[G. eats x] = yes* or negative questions, *which x* such that *[G. eats x] = no*). In contrast, yes/no questions provide a sentence with all its values and a "truth variable" *([Gianni eats bread] = x* or *[Gianni eats cheese]= x)* and then ask which truth value is applicable to the truth variable of the proposed sentence. In this light, open wh questions and yes/no questions are the inverse operation of each other. However, every question (asking for the value of a variable) is also an inverse operation of an affirmative clause (which

simply provides all values)[101]. Under this view, both open wh questions and yes/no wh questions have the same basic distinct elements (interrogativity, relevant/questioned constituent, marking of the open or yes/no "wh-type") and the same derivational steps. Marking interrogativity in InterP reflects the fact that **all** questions are inverse with respect to declarative clauses. Marking the distinct "types of wh" (i.e. open vs. yes/no) in WhP encodes the fact that open wh questions and yes/no wh questions are two inverse operations, the former **based** on the truth value, the latter **asking** for the truth value.

Alternatively, some clue can be derived from the observation made in §4.1.4 that the yes/no NMM is also used with some content questions as in (213), which actually cannot be answered with "yes" or "no". These are content questions which themselves explicitly provide a range of variation for the answer to be given by the hearer.

	y/n int.	
head RGT		**head LFT**

213. IX$_2$ WORK (IX$_2$) STUDY   [LIS/NGT: repeated from (183.b)]
     'Do you study or do you work?'

The fact that yes/no questions and alternative (content) questions share the same NMM is not surprising since it is widely conceded that yes/no questions entail an alternative question (i.e. *do you work?* roughly means *tell me: yes, you (do) work or no, you don't work?*). This suggests that the yes/no NMM might not serve to distinguish yes/no interrogatives from wh interrogatives, but rather that it marks some other feature which is related to alternative questions and is different from open wh questions. Namely, what distinguishes alternative questions from open wh questions is the fact that alternative questions explicitly provide a closed range of choices (the range of variation of the questioned variable) to the hearer who has to answer. Open wh questions, on the contrary, do not. Crucially, yes/no questions do indeed entail a closed range of answers: either yes or

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[101] Roughly, we can compare this with the situation in mathematics, for example, where *root calculation* and *logarithm* are both inverse of *exponentiation*. Yet, root calculation returns the base value which must be raised to a given exponent, whereas logarithm returns the exponent to which the base must be raised in order to obtain the desired result. Thus, in a sense, root calculation and logarithm are inverse operations of each other, as well as being both the inverse of exponentiation.

no. From this point of view, yes/no questions (169)–(171) can thus be seen as closed wh questions asking for the truth value of the sentence (*what? Either yes or no*) much in the same way as (other) alternative questions like (213) are closed wh questions asking for one variable within a finite range of variation (*what? Either work or study*). One can thus speculate that the difference between an **open** vs. **closed** range of variation is the relevant feature which groups yes/no and alternative content questions together, differentiating them from open wh questions. In other words, the difference between open vs. closed range of variation is the feature triggering yes/no vs. wh NMM. At this point, notice that Munaro & Pollock (2005) take the higher wh projection as hosting a disjunctive operator and assume wh-phrases to consist of an existential operator and a disjunctive operator yielding an infinite disjunction. Infinite disjunction, within an infinite set of values, is opposite to finite disjunction, which only acts within a closed set of values. Under this view, then, the fact that the higher WhP encodes the difference between open wh questions (i.e. infinite disjunction) and closed (yes/no or alternative) questions (i.e. finite disjunction) is compatible with the present analysis.

Clearly, further investigation is necessary to understand the function of the yes/no NMM. However, regardless of the exact function of the yes/no NMM, the unified structure proposed in this chapter for wh questions and yes/no questions turns out to be independently motivated by requirements shared by all interrogative constructions: the necessity to mark interrogativity, the necessity to mark the relevant element of the question, and the necessity to mark the type of interrogativity.

4.2.5 Structure and movement of topicalization with respect to nonmanual marking of questions

As mentioned in §4.1.5 and §4.2.2, the presence of topic projections, some of which are very high in the structure, explains why topicalized constituents occur to the left of material that has already been raised leftwards, such as imperatives or (wh or polar) interrogative clauses. This section relates the presence of different TopPs to some residual issues concerning the spreading of NMMs in interrogative clauses. It discusses some wh questions in which the wh NMM spreads only on a part of the sentence, but no topic NMM occurs, thus apparently contradicting the analysis proposed so far. It suggests that the topic NMM is associated

only with some TopPs, just as in spoken languages distinct topics have distinct intonations.

In §4.2.3 an account was given for the fact that the nonmanual markers of wh questions can spread across the whole clause, albeit independently from the presence of overt wh-phrases. So far, data have been discussed and analyzed assuming that the interrogative NMMs were **always** sentence-long or that they always cover at least the first position in the sentence, as in (206). Yet, as observed in some examples, this is not always the case: sometimes the spreading of NMMs seems to be optional and, so to speak, more flexible. According to the data described, parts of the sentence may be unaffected by the wh nonmanual marker. In some of these cases, the sentence shows the topic NMM on some constituents that precede the interrogative-marked part, as in (175.d), (188.a), and (188.b). It was immediately suggested that the phenomenon has to do with topicalization. Some elements are not part of the wh-interrogative marked string because they are in a topic projection, which assigns the topic NMM. However, on some other occasions, the elements unaffected by the wh NMM show no topic marker. See the IPSL example (194.b), repeated here as (214).

<div style="text-align:center"><u>   wh. </u></div>

214. YESTERDAY IX₂ PAY^TAKE G-WH   [IPSL: rep. from (194.b)]
      'What did you buy yesterday'

Similar facts are attested also in LIS and, possibly, in NGT. Unfortunately, I have not enough data do discuss IPSL and NGT. More accurate data are available for LIS, however. Cecchetto et al. (2004) report the sentence in (215) where the wh NMM occurs on part of the sentence, namely only on the direct question and not on its complement clause.

<div style="text-align:center"><u>   wh. </u></div>

215. PAOLO ARRIVE AFTER SAY WHO   [LIS: Cecchetto et al. 2004b:3]
      'Who said that Paolo arrived later on?'

My LIS informants, however, agreed that there are some interpretive differences, related to the fact that some constituents fall outside the NMM. For instance, they tend to consider (216.a) below as unmarked, while (216.b) and (216.c) were judged to be compatible with contexts in

which *Gianni* has been mentioned previously or it is known that *Gianni has eaten* (the examples are taken from Brunelli (2009)).

216.
    <u>   **wh**   </u>
    a.   GIANNI EAT WHAT   [LIS]
        'What did Gianni eat?'

               <u>   **wh**   </u>
    b.   GIANNI EAT WHAT   [LIS]
        '(Gianni) What did he eat?'

                  <u> **wh.** </u>
    c.   GIANNI EAT WHAT   [LIS]
        '(Gianni ate) What?'

It is difficult to accurately test such interpretive differences, but the data above suggest that the constituents outside the NMM may represent presupposed or given material and are thus a kind of topic. As the example (217) shows, these "presupposed topics" are clearly different from "raised-eyebrow" topics and, crucially, can co-cur with them.

217.   [LIS: adapted from Brunelli 2007: ex.nr. 24]
   <u>   **top.**   </u>   <u>   **wh**   </u>
   EXAM LIS **,** PAOLO ARRIVE AFTER SAY WHO
   'As for the LIS exam, who said that Paolo arrived later on?'

Notice, at this point, that in the literature about topics, a distinction is usually made between different kinds of topics (among others, Givón (1983); Frascarelli & Hinterhölzl (2007); Benincà & Poletto (2004)). On the one hand, there are lower topics, representing presupposed, given, familiar information. On the other hand, higher topics represent either given information which the discourse is about or known information newly (re)introduced as central for the discourse. Thus, although all topics are somehow known or given information, it seems that at least a rough distinction must be made between information given due to world knowledge (and brought into the discourse) and information given explicitly in the (previous part of the) discourse. Crucially, in spoken languages, different topics have different intonational features

(Frascarelli & Hinterhölzl 2007): lower topics are marked by a low tone whereas higher topics bear a raising, low plus high, tone. For the purpose of the present dissertation, I will not go into detail about topics, but will restrict myself instead to the observation that different kinds of topic exist, which may bear distinct intonations. As the Italian example (218.a) shows, a lower topic *Gianni* may precede the interrogative clause. In fact, as shown in the Veneto example (218.b), the lower topic can precede Poletto & Pollock's (2004b) higher WhP, which is filled by *'sa*.

218.

    a.   [Ital.]

        A proposito di/Quanto alla verdura, Gianni, cos'ha mangiato ieri?
        'As for vegetables, Gianni, what did he eat yesterday?'

    b.   [Ven.]

        Ciò, parlando de verdura (deso), Giani, 'sa gało magnà ieri?
        'Hey, speaking (now) about vegetables, Gianni, what did he eat yesterday?'

In (218.a) and (218.b), 'Gian(n)i' is interpreted as previously mentioned in the discourse and cannot be a new topic just introduced or shifted to. Because of this, it is different from the higher topic 'as for vegetables' which can mark a shift in the discourse: the higher topic, indeed, cannot be swapped and placed after 'Gian(n)i' without receiving a different intonation, a parenthetical very low tone. We thus have evidence that different topics may precede the interrogative clause and that not all topics are marked in the same way. Extending this observation to sign languages, it is quite possible that they, too, have different kind of topics in front of interrogative clauses and that not all topics bear a "raised eyebrows" NMM.

    In this light, I would maintain the proposal made in Brunelli (2007, 2009) that the variation in the extent of interrogative NMMs is possibly related to discourse properties. By virtue of these, presupposed or d-linked material occupies a low topic position, which is not associated with any NMM and is located above the higher wh projection WhP where the "lower eyebrows" wh NMM and the polar "raised eyebrows" NMM are encoded. This low topic is also different from Aboh & Pfau's (2011) topic (below FocP and without NMM). In contrast, higher topics
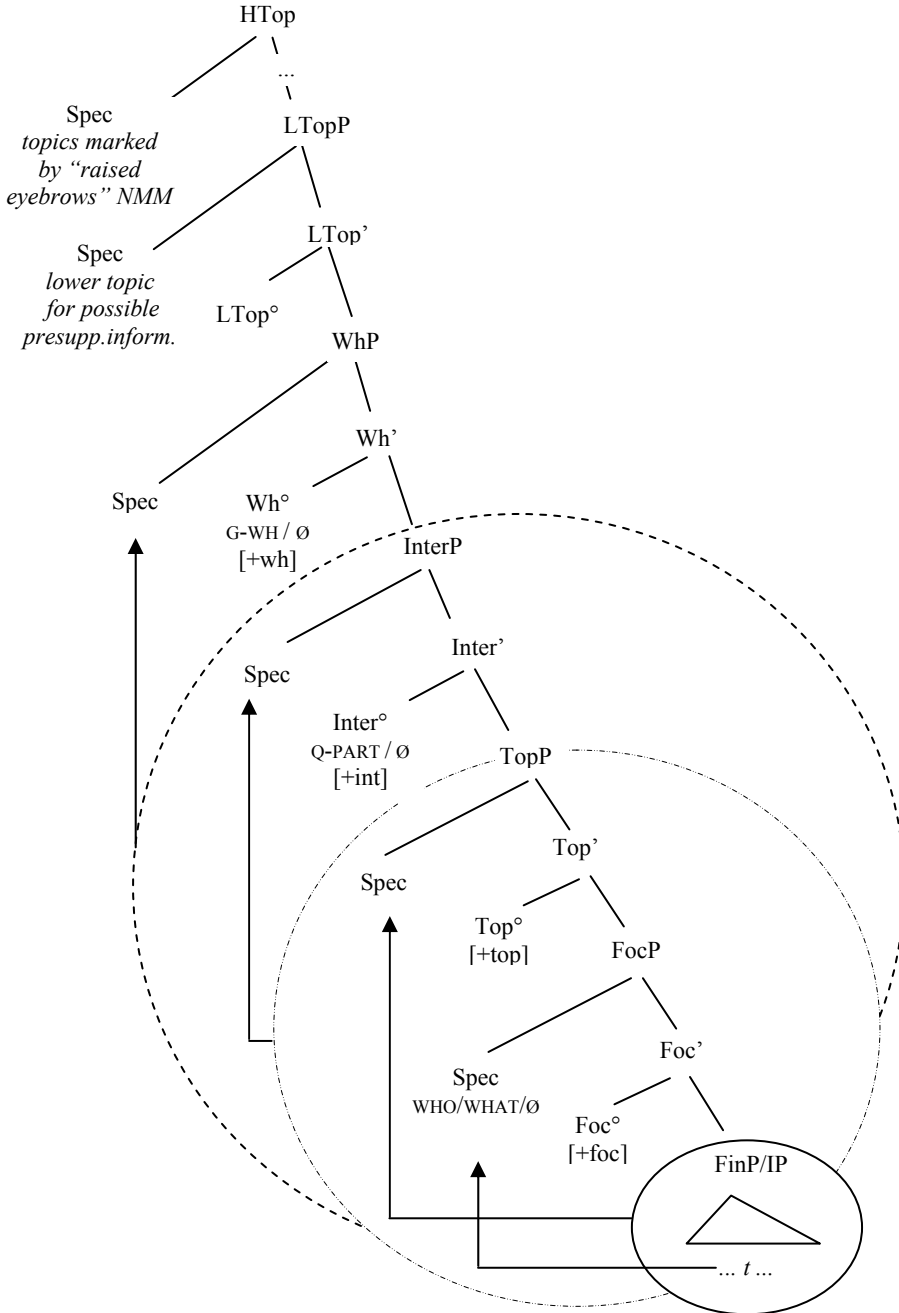
are hosted in a yet higher projection which assigns the "raised eyebrows" topic NMM to its specifier. A clarification is in order here. Brunelli (2007, 2009) tentatively employed the label GP (Ground Phrase) for this "presupposed-information" projection above WhP, drawing on Poletto & Pollock (2004a/b). Crucially, however, Poletto and Pollock's GP, which hosts postverbal clitics such as –*lo* in *gało* ('has he'), sits below interrogativity and below the higher wh. Thus, data shows that the low topic discussed here is hosted in a projection different from Poletto and Pollock's GP. Frascarelli & Hinterhölzl (2007) distinguish a higher topic (which I refer to in this section), a familiar topic (FamP, below FocP), and a GP (referring to Poletto & Pollock). They also propose a ContrP between higher topics and FocP. However, they do not discuss the position of topics with respect to a WhP such as the one proposed here. Thus, it is not possible to determine whether the low topic discussed here corresponds to some of Frascarelli and Hinterhölzl's projections.

However, apart from the label chosen for the low topic, the relevant observation put forward here is that in addition to the projections strictly necessary for interrogative clauses (including Aboh and Pfau's TopP) and in addition to higher topics (marked by "raised eyebrows"), there is also a topic projection which is not associated with "raised eyebrows". This low topic is located between the wh-zone and the raised-eyebrows-marked, higher topics. In other words, the fact that raised eyebrows mark topics does not necessarily mean that all topics must bear "raised eyebrows". Only higher topics have the "raised eyebrows" NMM. This proposal is nothing more than Frascarelli and Hinterhölzl's observation that in spoken languages, distinct types of topic have distinct intonational patterns.

Following this line of reasoning, figure (219) contains the same focus and topic projections of (201), plus a higher topic associated with "raised eyebrows" and a lower topic (still higher than WhP and InterP) related to d-linked material which does not bear any NMM. Sentences as (175.d) employ only the higher topic (with brows raised). Sentences as (217) employ both topics, while sentences (216.b) and (216.c) make use of the lower topic only. Sentences as (216.a) and the others discussed here neither use the higher nor the lower topic. I do not address the question here whether these topics are moved to or merged in the relevant projections. Notice also that this proposal entails that the "raised eyebrows" NMM has two distinct functions, marking high topics and

marking polar questions (in WhP). Interestingly, in some spoken languages, e.g. Italian, we can observe that a somewhat raising or high intonation is associated to (some) topics as well as to interrogativity. Let us then have a look at the topic projections involved in the formation of wh questions in (219)

219. Different topic projections above WhP

HTop

\
...
\

Spec
*topics marked
by "raised
eyebrows" NMM*

LTopP

Spec
*lower topic
for possible
presupp.inform.*

LTop'

LTop°

WhP

Spec

Wh'

Wh°
G-WH / Ø
[+wh]

InterP

Spec

Inter'

Inter°
Q-PART / Ø
[+int]

TopP

Spec

Top'

Top°
[+top]

FocP

Spec
WHO/WHAT/Ø

Foc'

Foc°
[+foc]

FinP/IP

... *t* ...

Although the structure in (219) is suggested by the behaviour of LIS and Italian topics in interrogative clauses, it must still be tested against NGT data. However, for ASL, Janzen (2007: 183, 186) also suggests that not all topics are necessarily marked by "raised eyebrows" (on ASL, see also Todd (2008); see Sze (2008, 2011) on Hong Kong Sign Language).

4.3 Conclusions

In conclusion, topicalization, imperatives, and interrogative clauses do not show much crosslinguistic variation between LIS and NGT. Both languages place topics to the left of the sentence and both accompany it with the "raised eyebrows" NMM. In both languages, this facial expression also fulfils the function of yes/no interrogative NMM, while wh questions are marked by "lowered/furrowed eyebrows" in both LIS and NGT. Imperative clauses display a more tense movement of the signs of the sentence and are marked by "furrowed eyebrows and eyes wide open" in LIS and "furrowed eyebrows and squinted eyes" in NGT. In wh questions, the wh phrase is usually clause-final, but can also appear in situ.

The only remarkable differences between these two sign languages concern the optional presence of the question marker Q-PART, which appears at the end of both yes/no and wh questions in NGT and has no counterpart in LIS. NGT can also display double-wh interrogative clauses, with NMM spreading, and sometimes allows for initial-wh interrogative clauses, with the NMM restricted to the wh phrase. LIS allows for the splitting of complex wh-phrases: along with the clause-final and the in situ position of the whole wh-phrase, this language can position the sign WHICH clause-finally and strand the noun in situ.

The data about topicalization, imperatives and yes/no questions from both LIS and NGT can easily be accounted for within an antisymmetric approach, since the order of elements "transparently" reflects the order of projections within the split-CP proposed by Rizzi (1997, 2001). Also data from a third sign language, IPSL, strengthen this hypothesis. Thus, optional lexical markers observed in some languages can be taken as the overt realization of functional heads within CP. For instance, the NGT interrogative marker Q-PART, which appears in yes/no and wh questions, occupies Rizzi's Inter°, following Aboh & Pfau (2011). The IPSL imperative marker IMP occupies Fin°, following Pfau (2006a) and Aboh

& Pfau (2011). NMMs which spread on topicalized constituents, on imperative clauses, and yes/no questions, are assigned in the specifiers of the relevant projections under spec-head agreement with the heads. The constituents raise leftwards to these specifiers and thus come to precede the lexical markers, which appear then clause-finally as the NGT sign Q-PART and the IPSL sign IMP. In other cases, the NMM is assigned in the specifier of a head which is not overtly realized so that the NMM is not accompanied by any lexical marker. This is the case in LIS interrogative clauses (which have no counterpart of Q-PART), in LIS and NGT imperatives (lacking IMP), and in LIS and NGT topics (which also have no lexical marker). Crucially, topicalized contituents, marked by "raised eyebrows" precede interrogative and imperative clauses, thus supporting Rizzi's claim for a TopP to the left of InterP (where interrogativity is marked) and FinP (where the imperative is marked). Questions with in situ wh do not per se require any rightward movement. They can be derived without major difficulties with leftward movement following Aboh & Pfau (2011). The whole interrogative clause containing the in situ wh sign raises leftwards to the specifier of a projection where it receives the NMM. If the head of this projection is lexically realized, it surfaces clause-finally as is the case with NGT Q-PART and IPSL G-WH.

However, some wh questions, namely final-wh ones, seem to pose a major challenge to this hypothesis, since their wh element in clause-final position apparently requires rightward movement. With respect to double-wh questions, which display both an initial wh and a final wh at the same time, there is still some controversy, especially concerning the spreading of NMMs, as the literature on this issue proves. Also the fact that in some languages, general wh signs (IPSL G-WH) behave differently from "pure" interrogative markers (NGT Q-PART) contributes to a high degree of crosslinguistic variation, which is apparently difficult to explain with one and the same antisymmetric structure. While general wh markers are strictly associated with the wh NMM, interrogative markers co-occur with both wh NMM and yes/no NMM. Yet, strikingly, double-wh and final-wh constructions show interesting similarities with some spoken languages which also allow the more common initial-wh construction generally accounted for by leftward movement (i.e. English *what are you doing t_{what} ?*). Also, as Aboh & Pfau (2011) noticed, in sign languages, wh questions can be found without any signs corresponding to

wh-phrases: these wh questions only have the general G-WH or the wh NMM.

On the basis of these observations, a universal antisymmetric structure of projections inside the split-CP is proposed to account for this variation. Three partially independent factors are taken to contribute to the formation of wh questions in all languages: *interrogative marker*, generic *wh marker*, and *specific wh* word or sign (*SWH*, a wh element as 'who, where, what' and so on, which, according to Poletto & Pollock (2004), can be a phrase or a clitic). It is assumed that languages vary as to whether these features are encoded lexically or nonlexically. Consequently, Aboh & Pfau's (2011) hypothesis of an interrogative projection for the question particle and a possible (not obligatory) focus movement for the wh phrase is enhanced following Poletto & Pollock's (2004a/b) and Munaro & Pollock's (2005) leftward-movement account of double-wh and final-wh questions. Two wh-related projections are assumed to "sandwich" the interrogative projection as proposed in Brunelli (2007, 2009). The higher wh projection (here labelled WhP) is taken to host the lexical G-WH marker of IPSL in its head and to assign the wh NMM of LIS and NGT under spec-head agreement. Occasionally this head can host a SWH in clitic form. The lower wh projection (FocP), in contrast, is assumed to host the lexical wh-phrases (when present). The interrogative projection is assumed to host the NGT interrogative marker Q-PART in its head.

Building on this, the final position of general wh markers and interrogative particles is derived by means of subsequent leftward movements, whereas the presence vs. absence of movement to FocP accounts for the possible clause-final vs. in situ position of SWHs. If an in situ wh-phrase co-occurs with its clitic counterpart in the higher WhP, double wh constructions appear in sign languages as they do in spoken languages. Also, the behaviour of LIS complex wh phrases (WHICH+NP) is explained in terms of optional movement to FocP. If the complex wh phrase is focalized, it surfaces clause-finally. If it does not focalize, it occurs in situ. If only the sign WHICH undergoes focalization, the complex wh phrase appears in a split form: the sign WHICH occurs clause-finally while the accompanying NP remains in situ. However, the wh NMM is always assigned by the head Wh° and its spreading depends on the amount of material that occupies [Spec;WhP].

The present analysis relates the NMM to one wh position, which can (but need not) be filled by a SWH. The position of SWHs is thus partially separated from the spreading of the wh NMM which seems to be able to occur on the whole clause regardless of the SWH being final, in situ or not lexically realized. Namely, data suggest that the NMM can occasionally coincide with the SWH, but this does not always have to be the case. The analysis also accounts for the fact that the interrogative particle Q-PART is independent from a specific NMM (it appears in both yes/no and wh questions), and yet receives the wh NMM in the appropriate situation. The proposed leftward movements also make it possible to account for an ASL asymmetry in initial-wh questions where only in situ subject SWHs can appear clause-initially while in situ object SWHs cannot. The hypothesis that the wh NMM is assigned in the higher wh projection (WhP) also accounts for some apparently less common NGT initial-wh constructions resembling those of "usual" spoken languages: an object wh-phrase does indeed appear clause-initially, surfacing in the higher WhP rather than in focus, but in doing so, it prevents the NMM from spreading over the rest of the clause. Thus, an antisymmentric approach, with only leftward movements applying inside the split-CP, although appearing unnecessary at first sight, accounts for the considerable crosslinguistic and intralinguistic variation observed in sign languages and captures some interesting characteristics that they share with spoken languages while also providing an explanation for the fact that in LIS and NGT, only wh questions seem to require rightward movement.

Yes/no questions are accounted for along the same lines, drawing on Katz & Postal's (1964) observation that yes/no questions are a kind of wh question and considering the possibility of focusing some constituent of the yes/no interrogative clause. I then argue for a parallelism between (open) wh questions and yes/no (wh) questions, proposing that both kinds of interrogative imply the presence of InterP and FocusP. On the basis of the fact that the yes/no NMM is also used in alternative content questions, I also suggest a tentative conclusion about the presence of the higher WhP and the possible need for it to mark yes/no questions differently from open wh questions. One possible explanation can be seen in the fact that both yes/no and alternative questions involve a finite disjunction where open wh questions involve an infinite disjunction. Following Munaro & Pollock's (2005) proposal that the higher WhP is related to a

disjunction operator, it is speculated that the different interrogative markers, sitting in WhP, may reflect the distinction between finite and infinite disjunction rather than marking yes/no interrogative clauses *per se*. On this last issue, however, further research is needed.

This analysis also assumes that different topic projections exist, with distinct nonmanual markers (e.g. "raised eyebrows" or no NMM) and distinct functions. Thus, *TopP* is used as a generic label. For instance, here a generic Top projection is assumed below InterP, following Aboh & Pfau (2011), but in Poletto & Pollock (2004a), some projections below InterP are related to «shared or presupposed information» (2004a:284), thus behaving quite differently from other topics (associated with topic shift). Also, recall Frascarelli & Hinterhölzl's (2007) hierarchy of topics which distinguishes an Aboutness/Shift topic from one or more Familiar topic(s), while Benincà & Poletto (2004a) argue for a yet finer subdivision of topic (and focus) projections. It is not my intention, here, to delve into the classification and distribution of topics in LIS and NGT[102]; rather, I restrict myself to the observation that different topics behave differently from each other. The presence of distinct topic projections with distinct features accounts for some interrogative clauses in which the wh or the yes/no NMM spreads only over a part of the sentence, while the rest of the sentence is either marked by a topic NMM or bears no NMM. It is argued that two topic projections are located above the interrogative zone, that is, above WhP and InterP. The higher topic is associated with the well known topic NMM, which is indeed encountered to the left of the interrogative-marked clause. The lower topic, which hosts d-linked material, has no overt marking (neither lexical nor nonmanual). This accounts for the fact that some interrogative clauses, especially those containing a subordinate clause before the interrogative clause, display only a partial spreading of the wh NMM without showing any topic NMM on the string of signs that precedes the wh NMM.

While the presence of topic projections both above and below InterP is not in contrast with Rizzi's (1997, 2001) assumptions, in particular the fact that distinct topic may bear different nonmanual markers according to their function will turn out to be relevant in chapter 5.

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[102] The analysis of distinct types of topics often relies on the ability to detect subtle interpretive differences. In my opinion, such an analysis is best carried out by researchers that are native signers.

Chapter 5: The structure of the Left Periphery – Combinations of clauses

In chapter 4, some left periphery phenomena were discussed, such as imperative clauses, topicalizations, and different kinds of interrogative clauses. This chapter deals with sentences formed by combinations of clauses. I will specifically present and discuss conditional ("if") clauses and restrictive relative clauses, also considering their interaction with topics. These phenomena also involve the left periphery in LIS and NGT. In fact, in these constructions, the subordinate clause is located in the left periphery of the matrix clause, as the analysis will argue. As in chapter 4, both word order and nonmanual markers play an important role in the analysis of these clauses, because nonmanual markers perform functions which in other languages are carried out by lexical markers. The chapter is organized as follows. In §5.1, I will describe conditionals and restrictive relative clauses in several sub-sections. In §5.2, I shall attempt to analyze these constructions on the basis of antisymmetric phrase structures proposed for spoken languages. In particular, I shall focus on a unified account for LIS internally-headed and externally-headed relative clauses. General conclusions follow in §5.3.

5.1 Word order with respect to combinations of clauses

The first part of this chapter describes the word order, the lexical markers, and the nonmanual markers encountered in conditional and relative clauses of LIS and NGT. Most data were obtained from the literature, but also informants' judgements are considered. Here, I would like to point out an important caveat. I take LIS and NGT conditional data to be pretty straigthforward; moreover, there is a considerable amount of research available on LIS relative clause constructions. In contrast, the discussion of NGT relative clauses is based on a very small set of (elicited) data. For this reason, I refrain from including NGT relative clauses in the analysis. In other words, in contrast to all previous chapters, the analysis of relative clauses lacks a comparative (LIS vs. NGT) component in that it addresses only LIS relative clauses (though relying also on some comparison with DGS). The exact status and the structure of NGT relative clauses must be determined in future studies. The first section of the chapter is structured as follows. In §5.1.1, I point

out some general aspects concerning combinations of clauses. In §5.1.2, I describe conditional clauses of LIS and NGT. In §5.1.3, I introduce different types of restrictive relative clauses of LIS and provide a few examples which suggest that relative clauses might also exist in NGT. The data are then summarized in §5.1.4.

5.1.1 Introduction

As mentioned in the introduction to this chapter, the combinations of clauses discussed here are left periphery phenomena (at least in NGT and LIS) in that they involve the raising or merging of a subordinate clause into the left periphery of the matrix clause. This is easily observed in the examples that will be provided in §5.1.2 and §5.1.3. As the data will show, both relative and conditional clauses can appear (conditional in fact must appear) before the rest of the sentence, even before the subject of the main clause. In addition to this, also the left periphery of the subordinate clause – be it a relative or conditional clause – may display some lexical material such as, for instance, the optional lexical markers of conditionals, which correspond to the complementizer 'if'. Moreover, we shall see that topic constituents can occur within the conditional clause, that is, they are embedded in the protasis of the conditional. In these cases, the topicalized constituent does not occupy its canonical position, but precedes other elements of the subordinate clause. Thus, both the matrix clause and the subordinate clause each have their own left periphery. Consequently, it is very important to distinguish the left periphery internal to the subordinate clause from the left periphery of the matrix clause (where the subordinate may or must sit). In this context, nonmanual markers provide important information. For instance, they clearly mark the conditional clause as well as the (restrictive) relative clause and its head noun. Thus, nonmanual markers distinguish these subordinate clauses from the matrix clause. It must be recalled here that various NMMs can be layered upon the same string of signs, which indicates that one and the same constituent has different features at the same time.

5.1.2 Conditionals

This section describes the linear order and the NMMs observed in conditional clauses, as well as the position of these with respect to the matrix clause.

In conditionals, the protasis usually bears specific nonmanual markers in LIS and NGT, sometimes glossed as "cond". Yet, these markers consist of different components. For instance, the LIS "cond" NMM contains "raised eyebrows", a "forward head tilt", and "tension of eyes and cheeks" (Branchini & Donati 2009:162). Accordingly, Branchini & Donati's example (14.c) should be rendered as (220.a). The NGT "cond" NMM, too, involves "raised eyebrows", as well as optional "head forward", "head tilt", and/or "chin lift" (Smith 2004). These elements combine in different ways and may vary in their spreading in Smith's examples, but, taken together, they clearly mark the conditional clause as distinct from the matrix clause. In NGT, a nonmanual marker "head nod" can also appear on the matrix clause. For instance, the NGT sentence (220.b) displays raised eyebrows and head forward on the conditional clause, while the head nod appears on the modal verb within the matrix clause. Also notice that the conditional clause may be divided from the matrix clause by a intonational break, much like topics can be separated from the rest of the sentence. At this point, we can compare LIS (220.a) and NGT (220.b). Notice that in (220.a), unlike (220.b), the different components are not listed above each other, because I cannot retrieve the extent of the spreading from Branchini & Donati's (2009) original transcribed sentence. Only "cond" as a whole is specified there. From Branchini & Donati's descriptions, it seems likely that all the components of "cond" have the same spreading domain, but this is not definite. From this example, it can be seen that conditional NMMs of LIS and NGT have similar (though not identical) features.

220.

    a.   [LIS: adapt. Branchini & Donati in 2009:162]

               rais.eyebr+tns.eyes+h.tilt
               DOG CAT CHASE CAT SCARED
               'If the dog chases the cat, the cat gets scared'

    b.   **raised eyebr.**   [NGT]

               head fwd   **hn.**
               IX$_1$ ITALY LIVE, IX$_1$ ITALIAN CAN SPEAK
               'If I lived it Italy, I could speak Italian'

Recall that "raised eyebrows" are the same NMM observed on topics in §4.1.5. Thus, despite the crosslinguistic variation observed, at least two different components can be identified as marking conditionals. First, there is a topic "raised eyebrows" NMM common to both LIS and NGT. In addition to this, there are also language-specific NMMs which are more clearly related to the conditional clause. For the moment, the different NMMs involved in conditionals are grouped under the label "cond". The reader must bear in mind that a number of NMMs are at work simultaneously under this label. They will be individually discussed in §5.2.3. In addition to NMMs, recall that both LIS and NGT have optional conditional lexical markers at their disposal, as mentioned in §5.1.1. Namely, NGT has the sign glossed IF in (221.b) or SUPPOSE in (221.c), while LIS has the signs IF in (221.a) or OCCASION (Bertone, p.c.). From (221.a), (221.b), and (221.c) we see that these lexical markers fall under the NMM and are the leftmost signs within the nonmanually marked conditional clause. In other words, they are the leftmost elements of the subordinate conditional clause.

221.

<u>cond.</u>

a. (IF) RAIN I HOME STAY   [LIS]

'If it rains, I (will) stay home'

<u>cond.</u>   <u>hn.</u>

b. (IF) RAIN, PARTY CANCELLED   [NGT: Smith 2004:24]

'If it rains, the party will be cancelled'

<u>cond.</u>   <u>hn.</u>

c. SUPPOSE IX$_1$ ITALY LIVE, IX$_1$ ITALIAN CAN SPEAK   [NGT]

'If I lived it Italy, I could speak Italian'

Smith (2004) reports also an optional "head thrust" NMM on the verb of the NGT conditional clause, as shown in (222). A similar NMM has been described in ASL conditionals by Liddell (1986). I have not been able to determine whether a counterpart of this marker exists in LIS.

cond	interr.

222. <u>ht</u>

222. SUPPOSE RAIN, PARTY CANCEL   [NGT: adapted from Smith 2004]
'If it rains, will the party be cancelled?'

Conditionals can be negated with the same markers employed in main clauses: LIS (223.a) employs the negative lexical marker NOT, while NGT (223.b) has the "negative-headshake" NMM. Both these markers occur within the spreading domain of the conditional nonmanual marker, thus indicating that they are part of the conditional clause. Notice that in NGT (223.b), the negative NMM replaces the NMM "head-nod" in the matrix clause.

223.

    a.   <u>cond.</u>   [LIS: adapted from Brunelli 2006:66]
        (IX_2) EXPLAIN$_1$ NOT, IX$_1$ UNDERSTAND CANNOT
        'If you don't explain (it) to me, I can't understand'

    b.   [NGT: adapted from Smith 2004: 48-49]
        <u>neg.HS</u> <u>neg. HS</u>
        <u>cond.</u>
        IF RAIN , PARTY CANCELLED
        'If it doesn't rain, the party isn't cancelled'

As for the position occupied by conditional clauses in the sentence, they must precede the matrix clause in LIS (Barattieri 2006) and NGT (Pfau 2006a, 2008a). The conditional clause and the matrix clause cannot be inverted, unlike in some spoken languages (e.g. English *If it rains, I stay at home* vs. *I stay at home, if it rains*). For instance, the counterpart of the ungrammatical NGT sentence (224) is ungrammatical in LIS as well:

aff	cond.

224. *PARTY CANCEL, SUPPOSE RAIN   [NGT: Pfau 2008a:4]
'The party will be cancelled, if it rains'

For LIS, Barattieri (2006) reports that, on some occasions, some informants accept sentences where the conditional clause follows the matrix clause which bears a special NMM, instead of the neutral

expression. She points out that in such cases, also the conditional clause has a special NMM (lowered eyebrows). However, in the vast majority of the examples that she discusses, the conditional clause occurs first: these examples are literally less marked than the sentences in which the conditional clause follows the matrix clause in that they involve less NMMs.

In NGT, conditional clauses precede imperative and interrogative clauses (Pfau 2006a, 2008a). The same also holds for LIS, according to informants' judgements. See, for instance (225.a), (225.b), and (226.a), (226.b).

225.
      <u>   cond.   </u>   <u>   imp   </u>

    a.   (IF) IX$_2$ FIRE SEE , HOUSE$_{RGT}$ (IX$_{RGT}$) $_2$GO$_{RGT}$ [LIS]

       'If you see fire, go home!'

      <u>   cond. </u>   <u>   imp   </u>

    b. FIRE SEE , HOUSE IX$_3$ RUN-TO$_3$ [NGT: Pfau 2006a:9]

       'If you see fire, run to the house!'

226.
      <u>   cond.   </u>   <u>   y/n </u>

    a. EVENING RAIN , IX$_2$ HOME STAY   [LIS]

       'If it rains in the evening, are you staying home?

      <u>   cond.   </u>   <u>   y/n </u>

    b. EVENING RAIN , PARTY CANCEL   [NGT: Pfau 2006a:9]

       'If it rains in the evening, will the party be cancelled?'

Pfau (2006a, 2008a) notices, however, that NGT conditionals can both precede and follow topics as illustrated in (227.a), (227.b). Topics and conditional clauses are separated by breaks in signing. Moreover, the topic and the conditional clause have distinct NMMs.

227.   [NGT: adapted from Pfau 2008a:7]

a.   _____cond.___   ___top.___
     SUNDAY IX$_2$ $_2$VISIT$_1$, BOOK , IX$_1$ t $_1$GIVE$_2$
     'If you visit me on Sunday, as for the book, I will give it to you'

b.   _top._   _____cond.___
     BOOK , SUNDAY IX$_2$ $_2$VISIT$_1$, IX$_1$ t $_1$GIVE$_2$
     'As for the book, if you visit me on Sunday, I will give it to you'

Again, the same phenomenon is observed in LIS. In (228.a) the conditional precedes the topic, while in (228.b) the conditional clause follows the topic. Both were judged grammatical by LIS signers.

228.   _____cond.___   ___top.___
a.   SUNDAY IX$_2$ $_2$COME$_1$ **,** BOOK IX **,** IX$_1$ $_1$GIVE$_2$ [LIS]
       'If you come to me on Sunday, the/that book, I will give it to you'

       ___top._   _____cond.___
b.   BOOK IX, SUNDAY IX$_2$ $_2$COME$_1$, IX$_1$ $_1$GIVE$_2$ [LIS]
       'The/that book, if you come to me on Sunday, I will give it to you'

Data also show that topics may even occur within the conditional clause, at least in NGT. Compare the position of the noun CAR in (229.a) with its position in (229.b).

229.   [NGT: adapted from Pfau 2008a:9]

a.   _____cond.___
     SUPPOSE CAR IX$_1$ FATHER t LEND AUX$_1$, $_1$VISIT$_2$
     'If with respect to the car my father lends it to me, I will visit you'

b.   _top._   _____cond.___
     CAR , IX$_1$ FATHER LEND AUX$_1$, $_1$VISIT$_2$
     'As for the car, if my father lends it to me, I will visit you'

In (229.a) the noun CAR does not appear in its canonical object position, but precedes both the verb and the subject, as topics usually do in all NGT and LIS sentences. Yet, as Pfau (2008a) points out, it follows the optional conditional marker SUPPOSE. This shows that the topic is part of the subordinate clause. This inference is supported by the fact that the noun falls under the conditional NMM. In contrast, in (229.b) the topic CAR precedes the conditional clause, is separated from it by a prosodic break and is outside the conditional NMM. The contrast between (229.a) and (229.b) proves that the topic in (229.a) is embedded within the conditional clause, while the topic in (229.b) is external to the conditional clause. I have not been able to determine whether embedded topics as NGT (229.a) exist also in LIS. However, in §5.2.2, the presence of NGT embedded topics will be compared to embedded topics in Italian.

5.1.3 Restrictive relative clauses

This section describes the linear order and the NMMs occurring in (restrictive) relative clauses. The data show a remarkable variation, both crosslinguistic and intralinguistic. The status of these constructions in LIS is also currently under debate, as will be evident from the data in this section (see §5.1.4 and §5.2.3). Also, recall that the NGT data are not clear. At some point, data from LIS and NGT will be compared to DGS data.

It may be difficult to detect the existence (and the structure) of relative clauses in sign languages because they usually lack overt complementizers and/or relative pronouns. However, there is evidence that sign languages have different strategies for relativization. ASL relative clauses were first described by Liddell (1978), who showed that this language has both internally-headed and externally-headed relative clauses, marked by NMMs in addition to specific signs. For LIS, Cecchetto et al. (2004a, 2006) first observed a relative construction involving a special sign, which is glossed PROREL or PE in the literature; the former gloss is motivated by its function in relative clauses, the latter by the fact that it is accompanied by a mouthing roughly resembling the sound 'pe'. Branchini & Donati (2009: 163) notice that this sign co-occurs with a "rel" NMM «consisting of raised eyebrows, a specific tension of the eyes and upper cheeks». Also «a slight head tilt» occurs according to Branchini (2006: 147). The NMM does not appear on the main clause. The sign PE/PROREL may appear in different positions shown

in (230.a), (230.b) and (231). In particular, in (231) the head noun falls under the "rel" NMM, thus indicating its position within the relative clause. A resumptive pronoun (IX) can appear in the matrix clause. These constructions have been analyzed as correlatives by Cecchetto et al. (2004a, 2004b, 2006) and as left-extraposed nominalized internally-headed restrictive relative clauses by Branchini & Donati (2009). In these examples, the authors do not indicate the spatial location of signs, but use the letter 'i' to indicate that signs are coindexed.

230.   [LIS: Cecchetto et al. 2004b:3]
   a.   BOY$_i$ prorel$_i$ CALL (HE$_i$) LEAVE DONE

   b.   BOY$_i$ CALL prorel$_i$ (HE$_i$) LEAVE DONE
      'A boy that called left'

231. <u>   **rel.** </u>   [LIS: Branchini & Donati 2009:164]
   DOG$_i$ CAT CHASE PE$_i$ (IX$_i$) HOME COME DONE
   'The dog that chased the cat came home'

The sign PE is usually clause-final, while the head is in-situ, thus following the LIS canonical S-iO-dO-V sign order as in (232) and (233).

232. <u>   **rel.** </u>   [LIS: Branchini & Donati 2009:164]
   TODAY MAN$_i$ PIE BRING PE$_i$ YESTERDAY (IX$_i$) DANCE
   'The man that today brought the pie yesterday danced'

233.   [LIS: Branchini & Donati 2009:165]
      <u>   **rel.** </u>
   PAOLO MARIA IDEA$_i$ SUGGEST PE$_i$ IMPORTANT
   'The idea that Paolo suggested to Maria is important'

However, other orders are also attested. Compare the position of PE in (234) with that in (235). Unlike (230.a) and (230.b), the NMM provides additional evidence that PE is within the relative clause in both sentences:

234.   [LIS: adapted from Branchini 2006:157]

<u>   rel.   </u>

CHILD COMPETITION WIN PE$_i$ IX KNOW TEACHER PRIZE GIVE
'I know that that teacher gave a prize to the child who won the competition'

235.   [LIS: adapted from Branchini & Donati 2009:169]

<u>   rel.   </u>

CHILD PE COMPETITION WIN TEACHER PRIZE GIVE
'The teacher gives a prize to the child who has won the competition'

In (235) the sign PE is in situ, unlike (234), and follows the relativized subject CHILD. Along the same lines, informants (Bertone, p.c.) confirm that (236) is grammatical, with the sign PE in situ following the relativized object COMPETITION. In the example, PE and COMPETITION share the same spatial location, to the signer's right side.

<u>   rel.   </u>

236.   CHILD$_{LFT}$ COMPETITION$_{(RGT)}$ PE$_{RGT}$ WIN IX$_1$ SEE$_{RGT}$ [LIS]
     'I saw the competition that the child won'

Despite the variation observed and regardless of where PE occurs, in (231)–(236) the noun is always in situ as in circumnominal relative clauses, thus supporting Branchini & Donati's (2009) observations that these clauses are internally-headed relative clauses (IHRCs), but not correlatives in the sense of Cecchetto et al. (2004a, 2006)[103] .

    In (237) PE is clause-final, that is, it occurs at the end of the relative clause marked by the NMM. However, the NMM does not spread over the head noun STUDENT, which precedes the relative-marked clause. In

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[103] As Guglielmo Cinque pointed out to me, if we consider the correlative clause to be a fronted relative clause with a resumptive element in the matrix clause, then virtually every relative clause can have a correlative counterpart. This hypothesis is in line with the observation that correlative clauses do not exist *per se* (no language has only correlative clauses). Under this view, we have a different meaning of the label "correlative". This comes closer to Branchini & Donati's left extraposition analysis discussed in the second part of this chapter.

(238) PE is clause-final again, the relative NMM spreads over the whole relative clause, but the head noun CITY appears before the subject IX of the relative clause. In (239.a), the relative NMM is restricted only to the sign PE, as an alternative to version (239.b), which has NMM spreading.

237.   [LIS: Branchini & Donati 2009:166]

                    ———————————— **rel.**
STUDENT$_i$ EXAM DONE PE$_i$ ALL$_i$ PASS
'The students that took the exam all passed'

238. ———————————————— **rel.**   [LIS: Branchini 2006: 182]
CITY$_i$ IX VISIT NEVER PE$_i$ IX SEE WANT VISIT
'I want to visit a city that I have never seen'

239.

    a.   [LIS: Branchini & Donati 2007:13]

                    ———— **rel**
    ONE WOMAN$_i$ MAKE-UP NOT PE$_i$ IX MEET NEVER
    'I never met a woman who does not wear make-up'

    b.   [LIS: Branchini & Donati 2007:22]

    ———————————————— **rel**
    ONE WOMAN$_i$ MAKE-UP NOT PE$_i$ IX MEET NEVER
    'I never met a woman who does not wear make-up'

Bertone (2007) reports the sign PE to occur optionally also in some relative constructions in which the head noun appears outside and to the left of the relative clause. Examples (240.a) and (240.b) show the sequence *head noun – (PE) – RC* where the head noun falls outside the scope of "tense eyes" NMM, which accompanies PE and the relative clause. Notice that Bertone associates "tense cheeks" (and "raised eyebrows") with definiteness and topicalization, keeping them distinct from "tense eyes", which thus acts as the relevant marker of restrictivity. She states that definiteness in LIS is marked by specific facial expressions, mainly raised eyebrows, head raised backward, tension of the cheeks, and mouth slightly open (in Italian «...inarcamento delle sopracciglia, dal sollevamento della testa, dalla contrazione delle guance e da una lieve apertura della bocca», p. 145). She also says that these

expressions may appear on topicalized phrases and keeps them distinct from tense eyes (in Italian «occhi socchiusi» / «occhi strizzati»). Indeed, in her examples, tense eyes spread differently from tense cheeks and mark the restrictive part of relative clauses, as well as adjectives derived from reduced relative clauses. Consider (240.a) and (240.b), which is an alternative version containing the sign PE.

240.

    a.   [LIS: Bertone 2007: 71]

<u>   tense cheeks   </u>

                <u>   tense eyes   </u>

VESTITO ROSSO IX$_{1\text{-}2}$ IERI VEDERE CL$_{\textbf{num+pos}}$ (IX$_1$) COMPRARE FATTO

cloth   red   I-you yesterday see CLASSIF. I   buy-PERF

'The red cloth that we saw yesterday among the others, I have bought it'

    b.   [LIS: Bertone 2007: 72]

<u>   tense cheeks   </u>

                <u>   tense eyes   </u>

VESTITO ROSSO (PE) IX$_{1\text{-}2}$ IERI VEDERE CL$_{\textbf{num+pos}}$ (IX$_1$) COMPRARE FATTO

cloth   red   (pe) I-you yesterday see CLASSIF I   buy-PERF

Examples (240.a) and (240.b) indicate that PE is optional and does not affect the behaviour of the NMM. Similar constructions are reported in Brunelli (2006). They lack the sign PE, as (240.a), but display the NMM "tense eyes" and are analyzed as externally-headed relative clauses. Two examples are provided in (241) and (242). The nonmanual marking in Brunelli (2006) is described either as "half-closed eyes" or as "smiling" effect (due to tension of eyes and cheeks): no "tense cheeks" marking is described alone. The "raised eyebrows" NMM, in contrast, is reported as a separate marker. The NMM "raised eyebrows", unlike "tense eyes", is optional. Notice that sentences can be signed with two hands, as in (242). The first line represents the signs made by the dominant hand and the second line the nondominant hand. Also, some indexes may be optionally held by one hand while the other hand performs other signs (a hold is represented by underscore). However, the presence of co-articulated signs does not affect the linear ordering of the relevant constituents, hence, it is not relevant for the analysis. The relation between order of

signs and NMM spreading is especially clear if the sentence is signed with one hand, forcing all the signs to appear in a sequence, as in (240) and (241). Notice that in (242), the verb SIGN is translated as 'speaking to' in the sense of 'having a conversation with'.

241.   [LIS: adapted from Brunelli 2006:72]

          raised eyebrows

            tense eyes/cheeks

BOOK DIX$_{LFT}$ YESTERDAY FATHER$_{RGT}$ $_{RDG}$BUY$_{RGT}$ TOMORROW IX$_1$ READ$_{LFT}$
'Tomorrow I will read the book that my father bought yesterday'

242.   [LIS: adapted from Brunelli 2006:71]

        tense eyes/cheeks

MAN YESTERDAY $_1$SIGN$_{MID}$ DIX$_{MID}$++ SISTER PIX$_1$ ENGAGED TOGETHER$_{MID}$
            IX$_{MID}$ IX$_{MID}$

'The man I spoke to yesterday (and) my sister are engaged' *or*
'The man I spoke to yesterday is engaged to my sister'

In (241), "tense eyes/cheeks" mark the information which selects the referent to be identified from a set of possible referents, that is, they mark the subordinate (restrictive) relative clause. The head noun and its optional demonstrative fall outside this NMM. They also precede the time adverb YESTERDAY of the subordinate clause. Since time adverbs usually start a sentence, this suggests that the head noun is external to the relative clause. Yet, the head noun and its relative clause are marked as one topic by "raised eyebrows" and indeed precede the clause-initial time adverb TOMORROW of the main clause, as topic constituents do. In (242) the head noun is again outside the NMM, which accompanies the relative clause. However, no topic "raised eyebrows" NMM is present, as far as I could observe.

    Unlike restrictive relative clauses, LIS appositive relative clauses as in (243) have the topic NMM, though data suggest that they lack the "tense eyes" NMM (Brunelli 2006). Notice that in this case, the reduplicated two-handed pronoun belongs to the main clause as it does not bear the "raised eyebrows" topic NMM that marks the relative clause. As in (242), the verb SIGN is translated as 'speaking to' in the sense of 'having a conversation with'.

243.   [LIS: adapted from Brunelli 2006: 68]

$$\overline{\text{\textbf{raised eyebrows}}}$$

MARCO$_{\text{MID}}$ YESTERDAY IX$_1$ IX$_{\text{MID 1}}$SIGN$_{\text{MID}}$ DIX++$_{\text{MID}}$ STUDENT GOOD FIRST

IX$_{\text{MID}}$

'Marco, who I spoke to yesterday, is my best student' *or*

'Marco, to whom I spoke to yesterday, is my best student'

Data show that "tense eyes" behave differently from "raised eyebrows", even though the two spread together in IHRCs as (231)–(236) and (238). Comparing (242) with (243) suggests that the LIS "rel" marker *sensu stricto* is the "tense eyes" facial expression, which marks restrictivity, and that this marker is independent from the "raised eyebrows" NMM which marks topicalization. In fact, the restrictive relative clause (242) contains only the "tense eyes" NMM, while the "raised eyebrows" NMM marks only the appositive (243), as well as topics. The fact that the restrictive "tense eyes" NMM appears also on IHRCs matches Branchini & Donati's claim that the IHRCs which they had analyzed are restrictive. However, the two NMMs do not always co-occur. Sentence (241) suggests that even when they co-occur, they do not necessarily spread to the same extent.

    This is similar to DGS EHRCs where the nonmanual marker «systematically excludes the head noun» (Branchini, Donati, Pfau & Steinbach 2007), but where the topic marker spreads across both the relative clause and the head noun when the relativized DP is topicalized. In DGS relative clauses, a lexical relative pronoun (RPRO) appears, which has distinct forms for human nonhuman referents (RPRO-NH). The relativized DP can appear in situ as in (244) and (245). In (244) the relativized DP is an object and occurs between the first person subject IX$_1$ and the verb BUY, as DGS is SOV. In (245) the relativized DP is a subject and precedes both the locative argument CONFERENCE and the verb GO-TO, but follows the time adverb TOMORROW.

244.   [DGS: adapted from Branchini et al. 2007:6]

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

IX$_1$ [BOOK$_{3a}$ [RPRO-NH$_{3a}$ POSS$_1$ FATHER READ]] BUY

'I bought the book that my father is reading'

245.   [DGS: adapted from Branchini et al. 2007:5]

$$\overline{\quad\text{rel}\quad}$$

TOMORROW [MAN (IX_{3a}) [RPRO_{3a} TIE BUY]] CONFERENCE_{3b} GO-TO_{3b}
'Tomorrow the man who is buying a tie will go to the conference'

Crucially, when there is topicalization of the relativized DP, as in (246), the topic NMM spreads across both the relative clause and the external head noun, although the latter is excluded from the relative NMM in (244). The topicalization is signalled also by the fact that the relative clause and its head noun are moved to the left, before the subject IX_1 ('I') of the matrix clause, as shown in (246).

246.   [DGS: adapted from Branchini et al. 2007:6]

$$\overline{\hspace{6cm}\text{top}\hspace{1cm}}$$

[BOOK_{3a} [RPRO-NH_{3a} POSS_1 FATHER READ]] IX_1 BUY
'The book that my father is reading, I bought (it)'

The fact that the topic nonmanual marker is independent from the marking of the relative clause in LIS is is reminiscent of the behaviour observed in DGS. In addition to this, the view that the DP can be topicalized in LIS relative constructions is supported by the optional occurrence of a resumptive pronoun as in (230.a), (230.b), (231), (232), (242).

Available NGT data are less clear. One informant was requested to translate from Dutch to NGT. The signed sentences were then translated back from NGT to Dutch by another informant who did not know the original sentence, nor the context. Crucially, the resulting Dutch sentence was the same as the original Dutch one, despite the intermediate NGT version. This indicates that NGT syntax allows signers to produce and recognize relative clauses. Compare, for instance the LIS sentence (247.a) with its NGT counterpart (247.b). Notice, again, the use of both hands, be it simultaneously or in sequence. The order of signs in the NGT example is similar to that of DGS and LIS EHRCs.

247.

    a.   [LIS: repeated from (242)]

                   __tense eyes/cheeks__

MAN YESTERDAY $_1$SIGN$_{MID}$ DIX$_{MID}$++ SISTER PIX$_1$ ENGAGED TOGETHER$_{MID}$

                         IX$_{MID}$ IX$_{MID}$__

    'The man I signed to yesterday and (my) sister are engaged'

    b.   [NGT]

                                    __top.__   __top.__

MAN NIX$_{LFT}$ YESTERDAY IX$_1$ $_1$TALK$_{LFT}$ ENGAGED$_{LFT}$TWO$_{RGT}$

                                   SISTER NIX$_{RGT}$_____

    'The man I talked to yesterday and (my) sister are engaged'

In NGT (247.b) both the relativized noun MAN and the nonrelativized noun SISTER bear the topic nonmanual marker. However, I have not been able to detect any other marker in addition to the topic marker. In LIS (247.a) no topic marker appears, but the relative nonmanual marker is observed (recall that the two markers are independent). Despite this difference between LIS and NGT, in both languages the head noun is displaced from its canonical position and precedes the time adverb of the relative clause. For instance, the noun precedes the adverb YESTERDAY in LIS (241), (247.a), and also in NGT (247.b). This suggests that the head noun is external to the relative clause in NGT as it is in LIS. Finally, notice that in NGT, relative clauses follow the noun even though some adjectives can be prenominal, as shown in (248.b). In a similar LIS sentence, (248.a), both the adjective and the relative clause are postnominal and the relative clause follows the adjective. In NGT (248.b), the topic nonmanual marker includes also the head noun as it does in LIS (241). In contrast, in LIS (248.a), the restrictive relative NMM excludes the noun PEN, although it does spread to the adjective RED (for predicative adjectives marked restrictively in LIS see Bertone (2007), but recall that in LIS also attributive adjectives are postnominal).

248.
<u>tense eyes/cheeks.</u>

a. PEN RED YESTERDAY LOAN GIVE TODAY FALL BREAK   [LIS]
'The red pen I lent you yesterday today has fallen and broken'

<u>top.</u>

b. RED PEN YESTERDAY IX$_2$ $_2$GIVE$_1$ TODAY FALL BREAK   [NGT]
'The red pen you gave me yesterday today has fallen and broken'

The different behaviour of the topic and the restrictive relative marker is supported also by crosslinguistic variation. The topic NMM is the same in both languages and it is able to affect the head noun in both languages (when topicalization occurs). In contrast, the restrictive relative NMM does not occur in both languages and (when it occurs), it does not affect the head noun. This supports the hypothesis that topicalization and relativization are independent of each other and that the head noun can take part in topicalization (as it is part of the relativized DP), although it is not part of the relative clause (the clause that relativizes the DP).

Before concluding this section, it is necessary to briefly discuss the LIS sign PE. Although initially, it was analyzed as a relative pronoun in Cecchetto et al. (2004a, 2006), Branchini & Donati (2007, 2009) show that PE is also used in constructions that are clearly not relative clauses. In these cases, it has a determiner-like function. For instance, PE may nominalize adjectives and numerals in (250), much as "the…one" does in English, and accompanies possessives as in (249). PE also occurs in sentences as (250), which has a cleft structure according to Branchini & Donati. Notice that in (250), PE does not bear the "tense eyes" relative marker, but "raised brows" ("rb" in Branchini & Donati's gloss).

249.   [LIS: Branchini & Donati 2009:169]
FIRST PE   /   SMALL PE   /   RED PE   /   MY PE
'the first one' / 'the small one'/ 'the red one' / 'mine'

250. _____ _rb_   [LIS: Branchini & Donati 2009:169[104]]
      HOUSE PE ANNA IX BUY WANT
      'It is a house that Anna wants to buy'

The observation that PE is a determiner is supported by Bertone (2007) who suggests that PE is an anaphoric element. Recall that according to Bertone (2007), definite DPs and topics often have the same NMMs, distinct from "tense eyes". For example, only the "dp" NMM occurs in (251). As the translation by Bertone herself shows, this is not a relative construction.

          _____ _dp_
251. ACQUA PE IX BERE BUONA NEG   [LIS: Bertone 2007:19]
      water PE ix drink good not
      'This water is not good for drinking'

Moreover, in Romeo (1997: 84-85) PE is grouped with similar G-handshape signs that convey emphasis, such as strong possessives and demonstratives (which also act as strong pronouns). Accordingly, it is glossed as LUI ('he/him'), QUELLO ('that'), and SUO ('his').

5.1.4 Summary

The data presented show that both LIS and NGT have conditional clauses. They also provide evidence for the assumption that LIS has restrictive relative clauses. These constructions sometimes have sign orders different from that of main clauses and may also be introduced by specific lexical markers. However, they can be recognized mainly through NMMs. Conditional clauses in LIS and NGT and LIS relative clauses share some common features, but also reveal some crosslinguistic variation. This variation concerns also features that distinguish conditional clauses from relative clauses.

With respect to sign order and the NMMs, there are some common features. The subordinate conditional clause must precede the matrix

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[104] Branchini (2006: 196) reports HOUSE PE bearing a NMM which she lables 'cleft' and consists of «raised eyebrows, tension of the eyes and cheeks and the head leaning forward». However, later, in Branchini & Donati (2007, 2009), only the NMM "raised eyebrows" is mentioned.

clause in both languages. Also the relative clause tends to precede the matrix clause. Moreover, in both languages, the conditional clause can either precede or follow topicalized constituents. Indeed, the NMMs of conditional clauses of both languages contain the same "raised eyebrows" facial expression observed on topicalized constituents. Relative clauses, too, often bear a "raised eyebrows" NMM in both languages (though not always). Finally, in both languages, the conditional clause may be introduced by an optional lexical markers IF or SUPPOSE, which thus act as counterparts of the complementizer 'if'.

Some variation was observed in the order of signs. For instance, the NGT data that I have been able to collect suggest that postnominal EHRCs (externally-headed relative clauses) might exist in NGT, although the data are problematic. Unfortunately, unlike LIS, the NGT sentences were obtained only by asking informants for a Dutch-to-NGT translation. It is quite possible that this influenced the data, driving the signer to chose the NGT relative construction that is more similar to Dutch. However, it has frequently been observed that different strategies of relativization coexist in spoken languages. For instance, De Vries (2002) lists Lakota and Latin among languages with postnominal and circumnominal relative clauses. Different strategies can also co-occur in sign languages, as in the case of ASL (Liddell 1978) and in LIS. In fact, LIS allows both for IHRCs (correlatives according to Cecchetto et al. (2004a, 2006), or left extraposed internally-headed relative clauses according to Branchini & Donati (2009)), and also for postnominal EHRCs (Brunelli 2006; Bertone 2007).

In what might be NGT relative clauses, I have neither been able to observe complementizers nor relative pronouns, whereas data about LIS reveal a sign PE which can occur in different positions both in EHRCs and in IHRCs (the distribution of PE is summarized at the end of this section). Nonmanual markers, too, show some variation. In addition to the topic "raised eyebrows" NMM seen in §5.1.3, other components may also appear, which are language-specific and more strictly related to the relevant constructions. Thus, LIS conditional clauses bear also a "tense eyes" NMM and a "tense cheeks" NMMs, while NGT displays a "head forward" NMM. The LIS NMMS "tense eyes" and "tense cheeks", as well as "raised eyebrows", occur also on LIS relative clauses. However, there is still debate about some of them. Branchini & Donati (2007, 2009) group together "tense eyes" and "tense cheeks" and take them as one

NMM distinct from "raised eyebrows". Furthermore, according to those researchers, these two NMMs spread together as one relative marker ("rel"). In Bertone (2007), raised eyebrows and tense cheeks are assumed to mark both topicalization and definiteness, while tense eyes appear only on the restrictive part of relative clauses. It excludes the head noun that is restricted by the relative clause. In Brunelli (2006), no "tense cheeks" marker is reported alone, but the topic marker "raised eyebrows" spreads differently from the restrictive relative marker which contains "tense eyes" (and is defined as a sort of smiling expression containing 'half-closed eyes').

Finally, in NGT conditionals, topicalized constituents were observed that were displaced from their canonical position, but still formed part of the subordinate clause because they follow the optional lexical markers IF/SUPPOSE and fall under the conditional NMM that spreads across the conditional clause. This proves that also the subordinate clause has a (partial) left periphery in NGT. I have not been able to observe this in LIS. In relative constructions, it is important to distinguish the position of the "relative complex" (*head noun +RC*) within the main clause from the position occupied by the head noun with respect to the relative (the subordinate) clause.

Cross-checking of data sheds some light on the role of NMMs. Further investigation is necessary to fully clarify their function and distribution. However, along the lines of what was observed in conditional clauses in §5.1.2, it appears that at least two relevant components must be kept distinct in LIS relative clauses, namely the topic NMM "raised eyebrows" and the (restrictive) relative NMM *sensu stricto* "tense eyes". In fact, "tense eyes" is the only marker that occurs obligatorily on restrictive relative clauses. In LIS postnominal EHRCs, the head noun appears displaced from its canonical position in the clause. It precedes the time adverbs, which are usually clause-initial, and falls outside the scope of the "tense eyes" NMM, even though it may still bear the topic NMM (especially when the relativized noun is the object of the main clause as in (241)). The order of signs and the spreading of the topic NMM of these EHRCs are very similar to those observed in DGS EHRCs (Branchini, Donati, Pfau & Steinbach 2007). In LIS IHRCs, on the other hand, the head noun is both under the scope of the topic NMM and also under the "tense eyes" NMM and it is usually in situ, inside the relative clause (which is then a circumnominal IHRC). In NGT, I have not

recognized any specific restrictive NMMs (distinct from the topic "raised eyebrows"). The only clue to assume that NGT may have restrictive relative clauses is the order of signs. The position of the noun is similar to the position of the head noun of postnominal EHRCs observed in LIS and DGS: it is displaced from its canonical position and is able to precede the time adverbs which usually start a sentence or a clause.

The nonmanual marking of the subordinate clause is obligatory in conditionals, regardless of the presence of the optional lexical marker IF/SUPPOSE. Data show also that the relevant LIS marker for restrictivity, "tense eyes", is independent of the presence of the optional sign PE. The sign PE, in turn, is independent of the type of relative clause, in that it usually appears in IHRCs, but it is also attested in postnominal EHRCs. It is optional because postnominal EHRCs are well-formed even without such a sign. It is able to appear in different positions because it is usually clause-final, but it is also able to occur in situ and even clause-initially. Thus, while PE-clauses have long been identified with IHRCs in LIS, and most IHRCs do indeed display the sign PE, PE-clauses fall into two groups: both IHRCs and postnominal EHRCs. It is also worth noting that the head noun is in situ in circumnominal IHRCs, regardless of whether PE is in situ or clause-final. In other words, LIS has final-PE circumnominal IHRCs and in-situ-PE circumnominal IHRCs. The head noun precedes the clause in postnominal EHRCs. Thus, the distributions of head noun and PE are not fully interdependent.

As shown by Branchini & Donati (2009), Bertone (2007), and Romeo (1997:84-85), PE is a determiner-like element in LIS acting as a demonstrative. This is in principle compatible with its optionality and its appearing in different positions. In fact, I would like to point out here that also across spoken languages, demonstratives may occupy diverse positions in relative clauses. For instance in Marathi correlatives (which according to Wali (2006) have eleven variations), a demonstrative *ti* ('that') may occur twice, as in (252):

252.   [Marathi: Wali 2006:289]

Ti	ji	mulgi	ghari	geli	ti	ithe	raathe
that	which	girl	home	went	that	here	lives

'The girl who went home lives here'

In Italian postnominal EHRCs, the demonstrative *quel(lo)* ('that') may replace the definite article *il* ('the') introducing the relativized DP, as in (253):

253. Dov'è il/quel libro di cui parlavi ieri? [Ital.]
     where is the/that book about which spoke-2SG yesterday?
     'Where is the/that book that you mentioned yesterday?'

5.2 Analysis

This second section is an attempt to analyse LIS and NGT conditional clauses as well as LIS restrictive relative clauses, and their interactions with topicalization using an antisymmetric structure. The analysis assumes a split-CP structure, following Rizzi (1997, 2001), for the left perifery of the main clause and also for the left perifery of the subordinate (conditional or relative) clause. The analysis of the different types of relative clauses found in LIS is based on Cinque's (2005, 2008) unified account, assuming a Spec-Head-Comp, antisymmetric structure and leftward movements also for some LIS constructions that seem to require rightward movement.

5.2.1 Introduction

Conditionals in LIS and NGT can be easily explained within the framework of antisymmetry and split-CP, even though, at first sight, some questions arise as to the ordering of the protasis with respect to topics and to interrogative clauses. The subordinate, that is, the conditional clause, occurs to the left of the main clause. The optional lexical markers are clause-initial. Thus, having a subordinate clause to the left of the main clause (possibly with topics) and having optional clause-initial lexical markers, conditionals can easily be accounted for in an antisymmetric Specifier-Head-Complement framework. For instance, as noted by Barattieri (2006), the LIS clause-initial conditional marker, which corresponds to the CP element IF (Ital. *se*), appears to the left of the conditional clause as in languages which have the [Spec;CP] on the left. Its position is thus in contradiction with the idea of a [Spec;CP] on the right in LIS:

«Una trattazione più approfondita andrebbe dedicata alla natura del segno SE. Sappiamo infatti che il connettivo logico corrispondente occupa, nelle lingue a testa iniziale, la posizione di [Spec, CP], e si trova quindi nella periferia sinistra della frase. Tuttavia se osserviamo il segno SE, notiamo come anche questo, quando presente, venga realizzato nella periferia sinistra della frase principale, dato questo che risulta degno di nota se consideriamo la LIS una lingua che realizza tale testa funzionale a destra.» (Barattieri 2006: 79)

In the following paragraphs, an analysis of conditionals will be made on the basis of Rizzi's split-CP.

For restrictive relative clauses, the observed postnominal EHRCs are not a problem for an analysis based on antisymmetry. In LIS, the distribution of NMMs and the position of the head noun indicate that the head noun is outside and to the left of these relative clauses, much as in languages with [Spec;CP] on the left such as English, Dutch or Italian. The order of signs of these LIS clauses is also reminiscent of DGS EHRCs and they are indeed analyzed as EHRCs, which possibly undergo topicalization (Brunelli 2006, 2009), although there is still debate on the status of some NMMs. The order of signs suggests that similar postnominal EHRCs might be present also in NGT, albeit with partially different NMMs, so that one and the same analysis can be applied to all three sign languages. However, given that the data I have collected do not provide conclusive evidence that NGT has restrictive relative clauses, I shall only offer an analysis of LIS.

Some problems arise with the IHRCs attested in LIS. For a long time these were seen as the same as the so-called PE-clauses, but the situation is more complicated. Data show that PE-clauses include both circumnominal IHRCs and postnominal EHRCs: in circumnominal IHRCs, the sign PE is clause-final or in situ, but in some EHRCs it is clause-initial. Thus, while the clause-final position of the sign PE/PROREL has been seen as a reason to analyze (different types of) IHRCs with a [Spec;CP] on the right (Cecchetto et al. 2004, 2006; Branchini & Donati 2007), the interaction between the spreading of NMMs and the distribution of PE indicates a more complex structure. In addition to this, assuming IHRCs with [Spec;CP] on the right would contradict other CP-related phenomena of LIS where [Spec;CP] appears to be on the left.

In §5.2.3, other specific details of the distribution of PE within IHRCs and EHRCs will be described, which make the analysis even more complicated. Much of the discussion will thus focus on PE-clauses in LIS, with special attention to those clauses that fall into the group of IHRCs, even though I shall also deal with the relative clauses in DGS. The section is organized as follows. In §5.2.2, conditionals are accounted for starting from Pfau's (2008a) analysis and taking into consideration some properties of the conditional NMMs. In §5.2.3 I shall examine relative clauses. I will investigate different accounts of relative clauses, starting from Cinque's (2005, 2008) unified structure for both IHRCs and EHRCs building on the observation that PE has a determiner-like status (Branchini & Donati 2007). The analysis of LIS postnominal EHRCs will be further extended to DGS relative clauses. In §5.3, some general conclusions will be drawn about the similarities between conditionals and relative clauses (Bhatt & Pancheva 2006; Arsenijević 2009; Haegeman 2009a, 2009b). In fact, the presence of the same "tense eyes" NMM in both conditional and relative clauses of LIS suggests that these constructions share important properties and possibly most of their structure. I will present some speculations about this in §5.3. Throughout the discussion, however, the reader must bear in mind that, since this chapter deals with **combinations** of clauses, the analysis must constantly distinguish between the left periphery of the subordinate clause and the left periphery of the main clause in which the subordinate clause is embedded.

5.2.2 Structure and movement of conditional clauses

This section shows that NGT topics embedded within the conditionals clause (§5.1.2.) are similar to embedded topics encountered in Italian. Accordingly, I first argue that the conditional clause is a subordinate clause with its own left periphery, merged somewhere in the matrix clause, which can also have its own left periphery. On the basis of the distribution of the NMMs and the position of the conditional clause with respect to the matrix clause, I then argue that the conditional clause is a topicalized constituent located in the left periphery of the matrix clause. Finally, I resume the discussion about embedded topics and suggest that the reason for a topic to occur within the conditional clause may be related to specific interpretive properties of the topic itself. At the end of the section, I conclude that even though the motivation is not yet

clear, the existence and the distribution of embedded topics, together with the clause-initial position of complementizers, strengthen the assumption of an antisymmetrically structured split-CP à la Rizzi, which holds crosslinguistically and also crossmodally.

The observation that both the main clause and the subordinate clause have each its own left periphery in combinations of clauses (§5.1.4) is not surprising. Although there are clear differences between main and subordinate clauses, each of them has a field for old/new information, as suggested by spoken language data. In fact, some kind of topicalization internal to the protasis of a conditional construction is observed also in spoken languages. For instance, in Italian (254) the embedded topic *a scuola* ('to school') is resumed by the clitic *ci* ('there'). It entails that 'the school' has been mentioned in the previous discourse and therefore, it cannot be uttered out of the blue.

254.   [Ital.]
    Se a scuola non ci vai, non imparerai mai niente
    Lit. 'If, to school, you don't go there-*clit*, you will never learn anything'

Crucially, the word order of (254) is very similar to the sign order of NGT (229.a), repeated as (255), where CAR is displaced to the left but still falls under the scope of the conditional NMM.

255.   [NGT: repeated from (229.a)]

<div align="right">cond.</div>

SUPPOSE CAR IX$_1$ FATHER t LEND AUX$_1$, $_1$VISIT$_2$
'If the car my father lends to me, I will visit you'

The subordinate clause lacks independent illocutionary force, hence its left periphery is reduced. However, granted that the subordinate lexical markers *if/se* and SUPPOSE are CP elements, there must be at least one topic position between them and the subordinate verb for the displaced constituents *scuola* ('school') and CAR. At the same time, the matrix clause also has a left periphery where topics can be positioned, as in (227.a), (227.b), (228.a), (228.b), and (229.b). Specifically, the fact that the subordinate clause precedes the topics in (227.a) and (228.a) indicates that it is able to be in the left periphery of the matrix clause, at least in

some sentences. Thus, in the case of conditionals, one must bear in mind that Rizzi's hierarchy of projections in the CP domain holds, at least partially, for both the main clause and the subordinate clause. These two structures are combined, so that the subordinate clause precedes the main clause.

In conclusion, it is reasonable to assume that the conditional clause, with its own left periphery, is located somewhere in the matrix clause, possibly in its left periphery, at least in some cases. This is sketched in (256): a position within the conditional clause must be available for topics like *scuola* ('school') in Italian (255) and CAR in NGT (254); at the same time a position in the matrix clause must be available for topics like BOOK in NGT (227.a) or similar cases as LIS (228.a). The exact position of the conditional clause is not determined yet, given that conditional clauses can either precede topics as in (227.a), (228.a) or follow them as in (227.b), (228.b). For the moment, we see that at least in some cases, the conditional clause must target a landing site above TopP in the left periphery of the main clause, in order to be able to precede the topic. Information about the position occupied by the clause when it follows (and is arguably below) the topic is as yet scarce.

256. Combining two left peripheries (simplified structure)
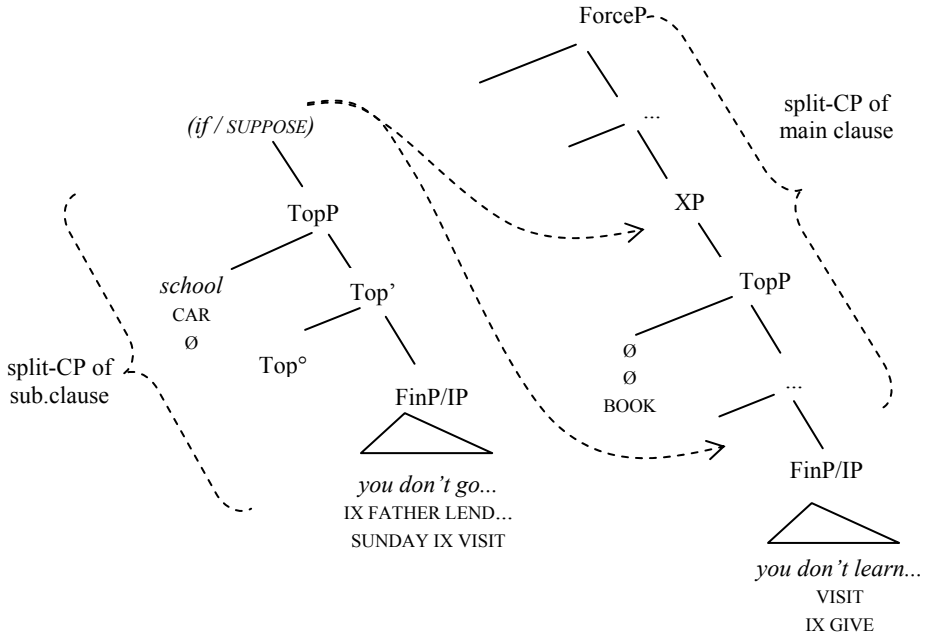
At this point, as suggested in figure (256), the question arises as to which projection in the main clause is the landing site for the conditional protasis. Is the landing site the same in all cases or are there different possible landing sites? In principle, when the subordinate clause follows the topic, as in (227.b) and (228.b), it may target a position below the topic BOOK, thus occupying a projection somewhere near the FinP/IP area, which hosts the main clause. In order to answer these questions, the issue of embedded topics will not be adressed until the end of this section. First of all, the focus will be on the left periphery of the main clause. The fact that conditional clauses in both LIS and NGT resemble topics in many aspects, as observed in §5.1.2, seems to suggest that it is easy to account for them. Just like topics, conditional clauses are marked by raised eyebrows, they have an intonational break, and they can only precede the rest of the sentence. They also seem able to change places with other topics, as topics do with each other.

This suggest the simplest answer: conditional clauses **are** topicalized. After all, as Pfau (2008a) points out, this behaviour of sign languages parallels that of some spoken languages, such as Hua. In fact, Pfau points

out that the NGT "raised eyebrows" NMM of both conditionals and topics parallels the fact that Hua marks conditionals and topics with the same –*ve* particle. Pfau (2008a) also shows that some alleged differences between topics and conditionals in NGT, ASL and DGS are due to independent differences between nouns and clauses, rather than to the clauses being conditional. For instance, conditional clauses can bear a negative headshake while topics cannot simply because predicates can be negated while DPs cannot [105]. However, nothing prevents negated sentential or clausal constituents from being topicalized so that a negative conditional clause can well be a topic. Moreover, according to Pfau (2008a), the head thrust which is occasionally observed in NGT conditional clauses can be taken as a mood marker which, as such, appears on verbs and not on nouns. Thus, it does not necessarily entail a difference between conditionals and topics. Under such a perspective, Rizzi's split-CP structure (257) with recursive topic positions seems to work well, once conditional clauses are assumed to be topics: conditionals sit in a topic projection in the left periphery of the main clause (as mentioned in chapter 4, I use the label InterP for Rizzi's IntP projection of interrogativity).

257. Force…Top*…(Inter…)Foc…Top*…Fin   (…IP)

Other authors, though questioning free recursion, argue for the presence of different topic projections preceding the interrogative phrase, although there is some debate on the hierarchy of such projections. As discussed in chapter 4, Frascarelli & Hinterhölzl (2007) argue for a shift/aboutness topic and a contrastive topic above interrogativity and a familiar topic lower than focus. Poletto & Benincà (2004) propose instead a more restrictive version of Rizzi's hierarchy whereby all topics must precede focus (see Badan (2007) for an application of such model to the analysis

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[105] This holds for unmarked sentences. In case of contrast, it seems to me that DPs can be negated at least in some languages. For instance, compare the position of *non* ('not') in Italian examples (i) and (ii). Unlike (i), in (ii), *non* ('not') does not negate the verb *ho scelto* ('I have chosen'), but only the DP *il colore* ('the colour').

     Telling about chosing some object

(i) Non ho scelto il colore, ma (ho scelto) la forma
    Lit. 'I have not chosen the colour, but (I have chosen) the shape'

(ii) Ho scelto non il colore, ma (*ho scelto) la forma
    Lit.'I have chosen not the colour, but the shape'

of the Chinese and Italian left periphery). All of them, however, assume that each topic position is related to a distinct semantic feature. For the purpose of the present dissertation, the question as to whether topics are (freely) recursive or related to distinct topic features is not relevant at this point. The most important fact is the presence of some topic slot in the matrix clause to host the topicalized conditional clause. In principle, then, (257) seems able to explain NGT and LIS conditionals. The problem with conditionals, Pfau (2008a) notes, lies in some restrictions on the position of the conditional clause within the main clause. Conditional clauses cannot follow the interrogative clause, but a topic and a conditional clause can co-occur before InterP, instead. Indeed, assuming (257), an NGT sequence *Topic-Conditional-Interrogative* as (258) can only be accounted for either with more than one topic projection before InterP or by exploiting FocP and InterP.

258.   [NGT: adapted from Pfau 2008a:7]

<div style="text-align:center">

___top.___   ___cond.___   ___wh.___
PARTY IX$_3$, EVENING RAIN, IX$_2$ WEAR WHAT
</div>

'As for the party, if it rains, what will you wear?'

On the one hand, if one assumes that two topics occur before InterP and that the conditional clause appears in topic position, the topicalized conditional clause should also be able to appear in the TopP that is below IntP. Consequently, the conditional clause should be able to follow the interrogative clause. Conditional clauses, however, never follow interrogative clauses in LIS and NGT. On the other hand, if the conditional clause is not a topic, the fact that it may not follow interrogative clauses derives automatically from the fact that it cannot occupy recursive topic projections. However, in this case, there is no position available for it in Rizzi's structure between the high TopP and InterP, unless it occupies FocP. Pfau (2008a) leaves this question open and tentatively proposes that, if conditional clauses are not topics, they could be assumed to move to FocP, following Neidle (2002), with subsequent raising of FocP to IntPer.

   Such an account, however, is not viable in my opinion because a conditional clause in FocP or InterP would conflict with interrogative

clauses and focalized elements[106]. For instance, wh questions allow topicalized constituents as in Italian (259.a). The topic is resumed by an optional pronoun. However, wh questions do not allow focalized constituents, as shown in Italian (259.b). This is probably so because FocP is already used to derive the interrogative. Yet, conditional clauses do occur with wh questions in both Italian (260.a) and NGT (260.b), as the topic does in (259.a). Thus, conditional clauses pattern with TopPs rather than with FocPs. (Notice the comma breaks with the topic and also the different orders Top>Cond , Cond>Top in (258) and (260.b))

259.
  a. A Mario, cosa (gli) regali?   [Ital.]
      'To Mario, what do you give (him) as a present?'

  b. *A Mario cosa regali?   [Ital.]
      '*To Mario what do you give as a present?'

260.
  a. Se piove, per la festa, cosa ti metti?   [Ital.]
      'If it rains, for the party, what will you wear?'

  b.   [NGT: adapted from Pfau 2008a:7]

      _____   _____   _____
         cond.   top.   wh.
      EVENING RAIN, PARTY IX$_3$, IX$_2$ WEAR WHAT
      'If it rains in the evening, as for the party, what will you wear?'

Examples (260.a) and (260.b) imply that also InterP is active for the interrogative matrix clause, given that these sentences contain an interrogative matrix clause. If the conditional clause, too, occupied InterP, it could not co-occur with the interrogative matrix clause. However, in (260.a) and (260.b), the conditional clause does co-occur with the interrogative clause, hence it cannot be the case that both are in InterP.

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[106] In this case, in my opinion, FocP and InterP can only be understood as belonging to the left periphery of the main clause (in which the conditional clause is located) since the analysis aims to account for the ordering of elements (topics and conditional) with respect to the main clause. Because the main clause has one FocP and one InterP, there are not enough slots to host both conditionals and focus elements or both conditionals and wh questions.

As for the possibility of topic recursion, instead, recall from chapter 4 that different topics can stack in LIS, NGT, and also spoken languages as Italian. See for instance (261.a), (261.b) and (261.c).

261.

    a.   [LIS]

        <u> top. </u>   <u>   top   </u> <u> yn. </u>

        SCHOOL IX$_3$ **,** TOMORROW EVENING MEETING**,** IX$_2$ LIX$_3$

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

    b.   [NGT: Pfau 2006a:10]

        <u> top. </u>   <u>   top   </u> <u> yn. </u>

        SCHOOL IX$_3$ **,** TOMORROW EVENING MEETING IX$_3$ **,** IX$_2$ BE-PRESENT$_3$ IX$_2$

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

    c.   A scuola **,** alla riunione di domani sera**,** ci vai?   [Ital.]

        Lit. 'To school, to the meeting of tomorrow evening, will you go there?'

Crucially, however, Italian also allows for topics to the right of the sentence, whereas no topic is allowed to follow the sentence in LIS or NGT. This observation is crucial because, given the distribution of LIS and NGT topics, the hypothesis that LIS and NGT conditional clauses are topicalized is no longer a problem. Quite to the contrary, it becomes a welcome solution. Because LIS and NGT conditional clauses share many similarities with topics, the initial problem was explaining why they must precede interrogatives, rather than determining their topic or nontopic status. However, once there is independent evidence of topic stacking before InterP, the behaviour of conditional clauses follows directly from their being topics in these languages. The fact that "topic stacking on the left" is attested also in some spoken languages makes it plausible that this hypothesis is not an ad-hoc solution for sign languages, but reflects some universal structure. On the other hand, the observation that not only conditional clauses are banned from following InterP in LIS and NGT, but that topics are also banned, indicates that topics and conditional clauses even share restrictions (in addition to the ability to appear in

different positions). Topics occur on the left, conditional clauses occur on the left. Topics cannot occur on the right, conditional clauses cannot occur on the right. This not only strenghtens the hypothesis that LIS and NGT conditional clauses are "every inch" topics, but also shows that the obligatory left peripheral position of conditional clauses derives from independent restrictions on (all) LIS and NGT topics. At present, I cannot explain what motivates these restrictions, but whatever the reasons are, they favour the hypothesis of a left periphery, rather than that of a right periphery, because both topics and conditional clauses appear to the left of the matrix clause in these languages.

The structure (256) is then refined in (262). Topic projections occur in the left periphery of the matrix clause and host both topics and conditional clauses, which are topicalized. These subordinate clauses contain themselves at least one topic projection in their own left periphery to host embedded topics. In (262), the topic projections of the matrix clause are higher than the projection of interrogativity and this accounts for the fact that topics and conditional clauses must precede interrogative clauses. Each of the topic projections can host alternatively the conditional subordinate clause, or the topic BOOK, thus allowing for (227.a) and (228.a) or (227.b) and (228.b).

262. Combining two left peripheries (in more detail)

```
                                          ForceP
                                         /     \
                                              ...
                                             /    \
                                               TopP
                                              /    \
  (if / SUPPOSE)                     conditional
                                     or topic
                                           /    \
                                               ...
                                              /    \
             TopP                               TopP
            /    \                              /    \
  embedded                          conditional
  topic                             or topic
                                          /    \
             Top'                            ...
            /    \                           /    \
        Top°                                   InterP
               \                              /    \
              FinP/IP                           ...
               /\                               /    \
                                                   FinP/IP
    subordinate                                     /\
    clause                                     matrix clause
```
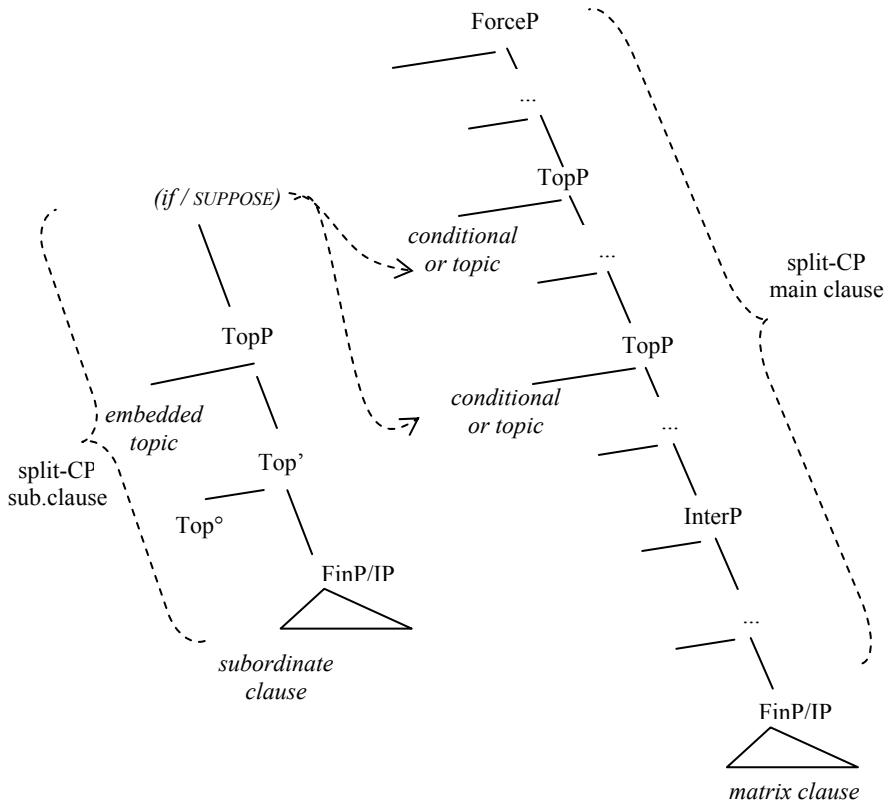
The hierarchy of projections in structure (262) matches, at least partially, what has been proposed in §4.2.1 and §4.2.5 for the topics that precede wh and polar questions, as well as imperatives. In (262), the label InterP subsumes other projections of the "interrogative zone" discussed in §4.2.3. These projections are omitted here for the sake of clarity.

A brief digression is in order, at this point. The interrogative zone is made up of WhP> InterP> FocP> TopP, according to the structure proposed in §4.2.3 along the lines of Aboh & Pfau (2011). This entails that one very low topic projection exists below InterP (in addition to the various higher and lower topics above WhP, here represented as TopPs above InterP). However for some reason, this very low topic position

below InterP is not accessible to the topicalized conditional clause, which is marked by "raised eyebrows". More generally, this very low topic position is not accessible to any constituent marked by "raised eyebrows", as suggested by the observation that "raised eyebrows" constituents do not follow interrogative clauses. This fact fits in with the assumption (made in §4.2.5) that only higher topics are marked by "raised eyebrows", while low topics are not. Thus, the hypothesis that conditional clauses are topicalized can be maintained. Only one adjustment is required: the fact that conditional clauses are not allowed in the low topic position below InterP follows from their being "raised-eyebrows" topics, rather than from their being just topics. Whatever restrictions are at play, the reasons of topics restrictions in LIS and NGT remain unexplained, as already mentioned. More investigation is required on the nature of the very low topic, as well as on the nature of conditionals. Crucially, however, the ban affects both topics and topicalized conditional clauses, thus confirming that they behave alike. It does not affect the assumption that conditional clauses are topicalized.

Following this digression, it must be remarked that the claim that conditional clauses are topics does not imply that they are just topics. The NMMs observed in LIS and NGT, as well as the optional lexical markers of these languages, indicate that conditionals have their own specific properties in addition to topicality. Thus, Pfau (2008a) suggests that the head thrust observed on some NGT conditional clauses as (222) may be a mood marker affixed to the subordinate verb in the head Mood°. Along the same lines, one can argue that "tense eyes" on LIS conditionals act in a similar way. However, this NMM should be assigned in the specifier of a functional projection (where the clause is located), rather than in the head, because it spreads on the whole subordinate clause rather than affecting only the verb.

Here I leave open the question concerning the nature of conditionals (some speculation is presented in §5.3). I restrict myself to the observation that their properties do not prevent them from undergoing a possible topicalization which layers a topic NMM over the conditional NMMs and over the optional lexical markers. As previously said, the fact that conditional clauses are topicalized in LIS and NGT forces them to precede interrogative clauses, as all topics do in these languages, and yet leaves them free to appear in different positions with respect to (other) topics, in the same way as all topics do with respect to each other.

A final issue concerns the initial observation that some topicalization is possible also **within** the conditional clause as in (229.a), (255). Similar examples in Italian show that the embedded topic cannot have a "high topic" or a "aboutness-shift topic" reading as in an out-of-the-blue sentence. Rather, it resumes some old information provided previously in the discourse much like low, familiar topics (recall Frascarelli & Hinterhölzl's (2007) distinction between aboutness/shift topics and familiar topics in §4.2.5). I have not been able to test whether these interpretive differences hold for embedded topics in NGT (and possibly in LIS). However, just the presence of embedded topics in both sign languages and spoken languages proves that, in principle, embedded topics are not impossible from the point of view of crosslinguistic and crossmodal variation, hence of the universal structure. In addition to this, the fact that embedded topics appear in the left part of the subordinate clause, after the optional lexicals marker, but before the subject, confirms the assumption of a left periphery, rather than that of a right periphery. This is in line with the observation that the optional lexical conditional markers IF/SUPPOSE appear to the left and not to the right of the clause.

In conclusion, then, the behaviour of LIS and NGT conditionals seems to call into question a detail of the split-CP structure (the existence/absence of a topic lower than InterP), rather than affecting its fundamentally antisymmetrical structure.

5.2.3 Structure and movement of restrictive relative clauses

This section analyzes the considerable variation attested in relative clauses in LIS and tries to derive them from a unified account proposed by Cinque (2005, 2008a) within a strictly antisymmetric framework. The analysis also draws on DGS data. As anticipated in §5.2.1, we will see that LIS postnominal EHRCs do not present problems for an analysis based on antisymmetry and leftward movements. The same observation can also be extended to DGS EHRCs (Branchini et al. 2007). LIS, however, appears to have also other relative constructions, the so-called PE-clauses, most of which are IHRCs.

The fact that LIS has different relative constructions is not surprising: not only spoken languages have more than one relativization strategy (see De Vries' (2002) survey, for instance), but also sign languages, for example ASL, have both IHRCs and EHRCs, (Liddell 1978). In the case

of LIS, however, some contradictions appear between IHRCs and other CP-related phenomena, which include EHRCs.

On the one hand, as already mentioned in §5.1.3, LIS PE-clauses have been analyzed as correlatives by Cecchetto et al. (2006) and as left-extraposed nominalized IHRCs by Branchini & Donati (2007): these relative constructions both fall in the group of IHRCs. Both analyses assume that LIS is a head-final language and has [Spec;CP] on the right. Indeed, such approach is supported by the fact that the sign PE/PROREL usually appears clause-finally.

On the other hand, recall from §4.1. and §5.1.2 that other CP-related phenomena, such as topicalizations and conditionals, are left periphery phenomena in LIS (and NGT) and thus point to a Specifier-Head-Complement structure of the CP domain. Even the final-wh interrogative constructions of these languages conform to final-wh and double-wh constructions observed in spoken languages with [Spec;CP] on the left, as shown in §4.2.3. Postnominal EHRCs are also a phenomenon observed in languages with Spec-Head-Compl structure and thus suggest an antisymmetric structure for LIS. In fact, in LIS postnominal EHRCs, the head noun appears to the left of the clause and precedes clause-initial time adverbs just as in languages with [Spec;CP] on the left. Moreover, some PE-clauses are postnominal EHRCs. In some of them, the sign PE is even able to occur clause-initially, that is, at the beginning of the nonmanually marked relative clause immediately after the external head noun.

Taken together, these facts seem to suggest two opposite deep CP structures in LIS at the same time. However, while one may be inclined to reject antisymmetry in the presence of crosslinguistic variation in favour of a parametrical setting determining the branching structure of languages, it is still not desirable to have two differently branching structures in one and the same language. In general, as discussed in chapter 1, postulating a language with some projections branching leftwards and some branching rightwards is against the economy principle for the elaboration and acquisition of the language. It is then attractive to analyse also IHRCs with a Specifier-Head-Complement structure in order to be able to argue for a single branching structure for the CP domain. Crosslinguistically, it would also be attractive to have one and the same structure underlying different languages, since postnominal EHRCs are attested also in DGS. Here, I will discuss

Cinque's (2005, 2008a) unified derivation for different types of IHRCs and EHRCs, which is based on a Specifier-Head-Complement branching structure. In doing so, I will follow Brunelli (2007, 2009), but will revise partially the analysis of IHRCs.

As anticipated in §5.1.4, the distribution of PE and NMMs in LIS IHRCs and postnominal EHRCs varies considerably and makes a unified account difficult. The analysis will proceed from postnominal EHRCs to cases which require a more detailed discussion. The discussion will address the different relative clauses in the following order. First, I shall address postnominal EHRCs of LIS compared with DGS, taking into account the possible presence of the sign PE at the beginning of LIS relative clauses and the relative pronoun RPRO(NH) at the beginning of DGS relative clauses. Second, I shall address LIS IHRCs with PE in situ, immediately after the head noun, which is also in situ. Then, I shall address LIS IHRCs with clause-final PE, but head noun in situ. Finally, I shall other LIS cases, which are more problematic and will be discussed at the end of this section.

Cinque (2005, 2008a) proposed a derivation that combines the matching and the raising account and also allows to derive different types of EHRCs and IHRCs. His proposal aims to formalise the intuitive observation that relativization entails the junction of two sentences (which become clauses) and that the head noun plays a role in both sentences. In Cinque's view, the head noun is really merged twice, as external head in the relativized DP and as an internal head in a clause embedded within the DP (note that here, "head" refers to the head noun, not to the head of a syntactic projection). Observing the crosslinguistic variation among spoken languages, he proposes that the merger position of relative clauses within the relativized DP is universally a projection above numerals and (attributive) adjectives and below demonstratives, as represented in (263). The piedpiping movements within DP seen in chapter 2 may then invert constituents, yielding different surface orders across languages. The relativized DP, in turn, constitutes a part of the main clause, as an argument of the verb of the main clause. At this point, notice that, just like other DPs, Cinque's relativized DP can either sit in FinP/IP or be a topic hosted higher in the left periphery of the sentence. The combination of the relativized DP (containing the subordinate relative clause) with the matrix clause is sketched in (263). Notice that AgrP*s* are omitted.

263. Merging position of subordinate relative clauses in the relativized DP and positions of DP in the sentence
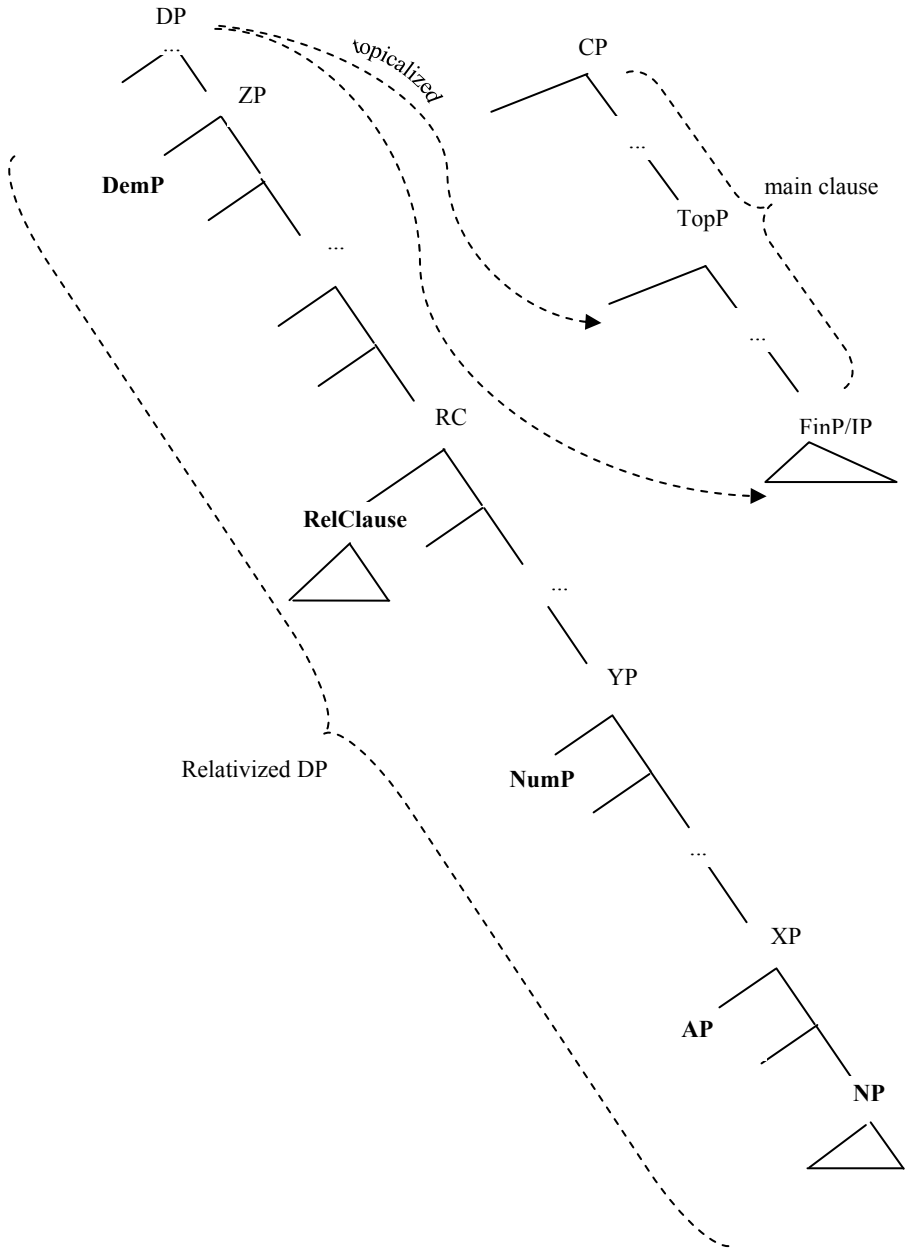
As in the case of conditionals, in (263) we must distinguish the positions of elements in the subordinate clause from the position occupied by the subordinate clause with respect to the matrix clause. According to Cinque (2003, 2008a), the "relative clause zone", includes also some complementizer positions because in various languages, there is evidence of two or three complementizers or relative particles appearing at the same time (Cinque (2008) reports the case of Buli, for example). Leftward movements within this zone yield identification and deletion of either the internal head or the external head. They also lead to the final or initial position of complementizers and relative pronouns. For instance, raising of the internal head and deletion of the external one produce IHRCs. They produce correlatives, if the internal head raises leftwards alone (to the left of the RC) and deletes the external head (only the surface order is represented here):

- *int.head – RC – (ext.head)*

They produce (circumnominal) IHRCs, if the whole relative IP raises with the internal head remaining in situ (i.e. if the internal head raises as part of the whole IP) or, alternatively, if nothing moves. The external head is deleted also in this case:

- *RC[…int.head…] – (ext.head)*

In contrast, if the external head raises leftwards above the internal one, it triggers identification and deletion of the internal head and the clause is spelt out as a postnominal EHRC.

- *ext.head – (int.head) – RC*

If the internal head is accompanied by an overt quantifier or demonstrative (either preceding or following the head noun), this is still pronounced after the internal head is deleted and it thus surfaces as a relative pronoun, yielding the sequences:

- *ext.head – rel.pron. (int.head) – RC*   or
- *ext.head – (int.head) rel.pron. – RC*

In fact, some languages have quantifier-like *wh*-relative pronouns (e.g. English *the man with whom*), while other languages have demonstrative-like *d*-relative pronouns (e.g. German *der Mann mit dem* 'the man with whom'). Some languages "fluctuate" between the two (e.g.

Dutch *de man met wie* 'the man with whom', but *de man die* 'the man whom'). On the other hand, other languages contain both a quantifier-like and a determiner-like definite element (e.g. Italian *l'uomo con il quale* lit. 'the man with the which…') which has also the property to recall an aforementioned referent. In Brunelli (2007, 2009), an application of Cinque's proposal, with two complementizer positions, derives LIS EHRCs as (241). As we will see here, this account works also for DGS (244), (246). As far as I know, DGS is the only sign language to have a relative pronoun (with distinct forms RPRO-H/RPRO-NH for human and nonhuman referents, see Branchini et al. (2007)).

In this perspective, the fact that LIS has postnominal EHRCs is explained by its inverting piedpiping movements within the DP (see chapter 2). In fact, since these roll-up movements reach at least DemP in this language and granted that relative clauses are located lower than DemP, roll-up movements are also able to raise the (external) head noun across the relative clause, dragging along possible adjectives and numerals. The head noun of LIS EHRCs, BOOK in (241), is merged in DP, externally to (and lower than) the relative clause, as indicated by the fact that it does not bear the relative NMM "tense eyes". It then raises leftwards with DP-internal pied-piping movements until it reaches a position above the relative clause and its internal head, which is thus deleted. At this point, further raisings bring the external head above DemP. By this, the noun BOOK comes to precede the demonstrative (DIX), which is itself outside the relative NMM because it is merged above the relative clause.

In LIS (248.a) the adjective RED follows the noun PEN, but noun and adjective precede the restrictive relative clause. The NMM on RED suggests that this may be an adjective derived from a reduced relative clause (see Cinque (2005b)). However, although its status is not clear to me, remember that all adjectives generally follow the noun in LIS. The order of signs can be derived if the noun raises leftwards above the relative clause and pied-pipes the adjective with inversion (which is usual in LIS). Raising of the head BOOK to the left of the relative clause derives also the order of signs of DGS (246). These sequences of movements yield postnominal relative clauses similar to those observed in head-initial languages as Italian (except that in Italian, the head noun stops between the relative clause and the demonstrative). After relativization has occurred, the relativized DP can be topicalized, as previously

observed. In doing so, the relativized DP (head noun + RC) receives the "raised eyebrows" NMM. The derivation of topicalized relative clauses as LIS (241) and DGS (246) with Cinque's account is represented in more detail in figure (264).

264. Externally-headed relative clauses of LIS and DGS
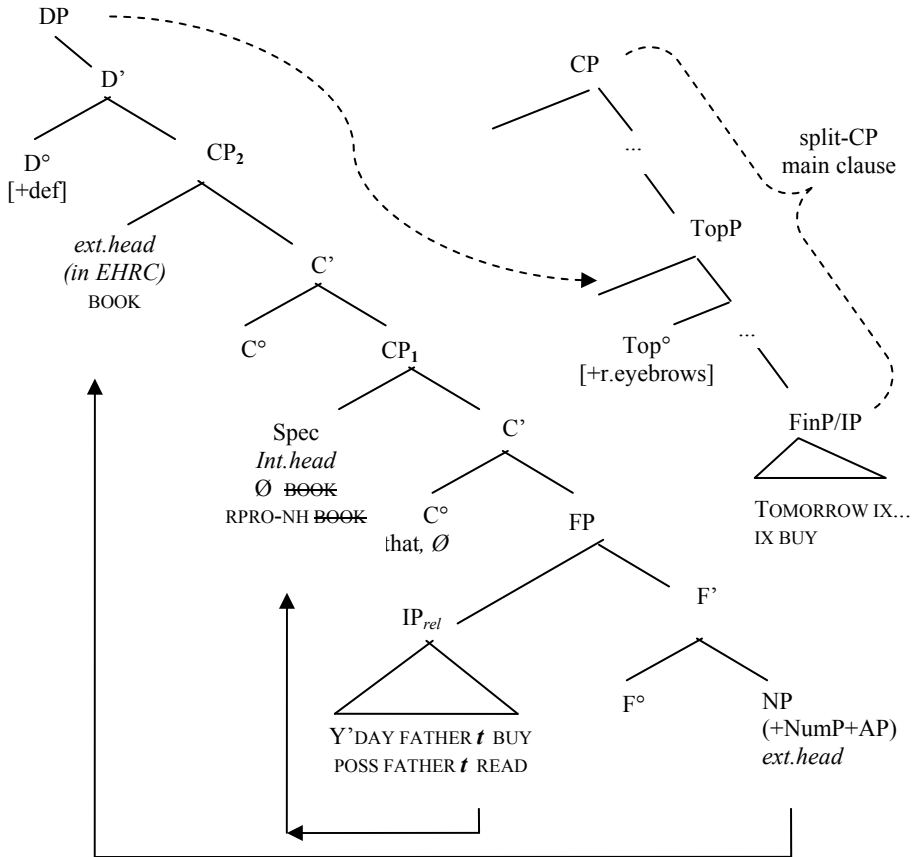
In (264), the external head raised to [Spec;CP$_2$] identifies and deletes the internal head raised to [Spec;CP$_1$]. Because in LIS (241), neither demonstratives nor quantifiers accompany the internal head noun, [Spec;CP$_1$] contains no lexical material after deletion and no overt relative pronouns appear. The relative clause is accompanied only by an overt external head so that the sequence *ext.head – ø – RC* appears in LIS (241). Recall that the demonstrative DIX in LIS (241) is merged externally

to the relative clause (it accompanies the external head noun and is outside the "tense eyes" NMM). According to Cinque, DemP is located between DP and the relative clause. Thus, the DIX of (241) must not be confused with the demonstratives and quantifiers that accompany the internal head noun and surface as relative pronouns (as the DGS RPRO or RPRO-NH). The same mechanism of (241) accounts also for LIS (240.a), which has the same order of signs as (241). In the case of DGS relative clauses as (246), the internal head noun is accompanied by RPRO(NH). After the external head deletes the internal one, RPRO(NH) still occupies [Spec;CP$_1$], thus yielding the same sequence *ext.head – rel.pronoun – RC* observed also in some spoken languages (e.g. German and Romance languages). In all the cases in (264), however, the overt head noun is the external one, which sits higher than and before time adverbs at the beginning of the subordinate clause. As for NMMs, the whole LIS clause bears the "tense eyes" facial expression, but since this does not spread on the external head, it must be assigned in a projection below CP$_2$, possibly the FP represented in (264). After relativization has taken place, the whole relativized DP forms part of the main clause. At this point, figure (264) shows that, if the relativized DP is topicalized, it sits in the left periphery of the main clause and receives the usual "raised eyebrows" nonmanual marker, thus yielding LIS (241) and (240.a), and DGS relative clauses as (246).

In contrast, if the topicalization shown in (264) does not occur, the relativized DP occupies its canonical argument position in the IP of the main clause and it does not bear any additional nonmanual marker (layered on the relative one). Only the first part of the derivation occurs, so that a relative clause is generated, but no topic NMM occurs, as exemplified in LIS (248.a), (247.a) and in DGS (244) and (245).

This also accounts for some crosslinguistic variation observed between LIS and DGS. In LIS there is relativization, marked by "tense eyes", and optional topicalization, marked by "raised eyebrows". That topicalization is optional in LIS is suggested by the comparison of (241) with (247.a) and (248.a). In DGS, topicalization is optional as in LIS and, when it occurs, the head noun receives the usual topic NMM together with its relative clauses, thus yielding sentences as (246). When topicalization does not occur, sentences as (244) and (245) appear. In this perspective, the difference between LIS and DGS EHRCs (and between these sign languages and spoken langauges) lies only in the different

NMMs assigned by the projections involved in the derivation and in the fact that the internal head noun may come with or without an overt pronoun (the quantifier or demonstrative). The derivation (264) also captures the fact that in LIS, where different NMMs appear, the spreading of the "raised eyebrows" NMM is independent from the "tense eyes" NMM, which marks the relative clause. The "raised eyebrows" NMM is assigned by Top°, as it is a topic marker, only when the whole DP occupies a topic position in the main clause. The "tense eyes" relative NMM is assigned in another projection, possibly in Cinque's FP, and is thus independent from the presence of PE (§ 5.1.4). The same derivation holds for the distribution of the topic NMM in NGT and DGS relative clauses.

LIS initial-PE relative clauses as (240.b) can also be treated as EHRCs. The sign PE accompanies the deleted internal head, thus bearing the "tense eyes" NMM and surfacing in the expected position between the the remainder of the relative clause and the external head, in the same way as RPRO(NH) does in DGS. In principle, this PE which accompanies the internal head may be either a quantifier or a demonstrative. From this perspective, the difference between LIS (240.a) and (241), on the one hand, and LIS (240.b), on the other, is only the optional presence of PE. In particular, LIS (240.a), which has the same structure of (241) derived in figure (264), is a subcase of LIS (240.b), where the sign PE can be optionally overt. Thus, in (265), the Cinquean derivation (264) is extended to LIS EHRCs such as (240.b). This means that one and the same account derives LIS clauses with clause-initial PE, DGS clauses with clause-initial RPRO(NH), and LIS clauses without PE. The linear order is *ext.head – PE / RPRO – RC* in LIS and DGS, as well as *ext.head – ∅ – RC* when LIS has no overt PE.

265. Externally-headed relative clauses (optional clause-initial PE≈RPRO)

DP

D'

D°
[+def]

CP₂

ext.head
(in EHRC)
BOOK
VESTITO
BOOK

C'

C°

CP₁

Spec
int.head
Ø BOOK
VESTITO (PE)
RPRO-NH BOOK   that, Ø

C°

C'

FP

IP_rel

Y'DAY FATHER *t* BUY
IX IERI *t* VEDERE
POSS FATHER *t* READ

F'

F°

NP
ext.head
t_book / *t_vestito*

CP

...

TopP

Top°
[+r.eyebrows]

...

split-CP
main clause

FinP/IP

TOMORROW IX ...
IX COMPRARE ...
IX BUY
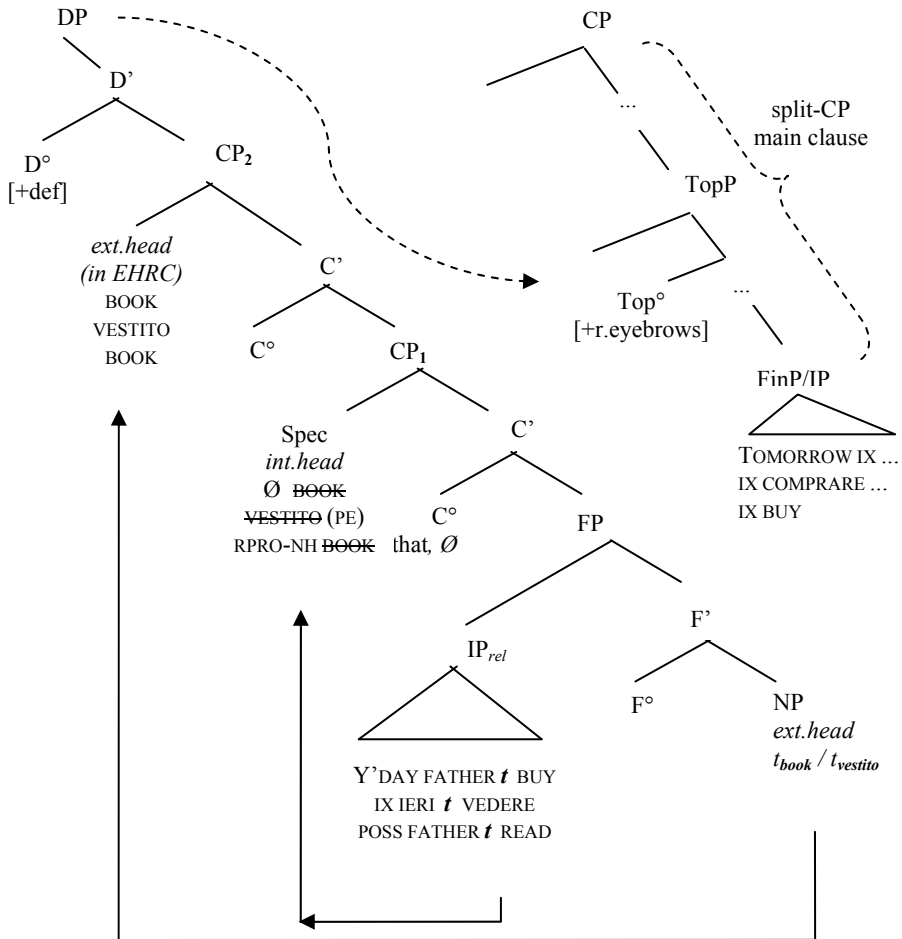
As previously seen, however, LIS also has PE-clauses which are IHRCs. This is indicated by the fact that the head noun falls within the spreading domain of the "tense eyes" NMM and follows the clause-initial time adverbs of the subordinate clause.

As mentioned in §5.1.3, initial accounts for these clauses were based on the assumption that [Spec;CP] is on the right in LIS. In Cecchetto et al. (2004, 2006), PE-clauses are analyzed as correlatives and the clause-final position of PE is treated as the result of PE moving rightwards to CP. Yet,

the possibility of having PE also in clause-initial position as in (240.b) suggests that the clause-final position of PE is not necessarily related to [Spec;CP] being on the right. The fact that PE appears also in EHRCs indicates that the "internal headedness" does not depend automatically on PE. More in general, PE appearing also in nonrelative constructions as (249-251) shows that even the "restrictiveness" and the "relativeness" of a relative clause do not depend on PE, as confirmed by the fact that the "tense eyes" relative NMM is independent from PE. In addition to this, recall that other CP-related phenomena as topicalization (§4.2.1 and §4.2.5) and conditionals (§5.2.2) clearly involve a structure where specifier are on the left, not on the right. Wh questions, despite their crosslinguistic and intralinguistic variation, can also be derived with an antisymmetric structure (§4.2.3) as they display a similar variation even in languages with [Spec;CP] on the left. Thus, a CP structure with specifiers on the right is required only by a limited number of constructions, namely, only by some relative clauses of LIS. Incidentally, relativeness and restrictiveness independent from PE are reminiscent of Aboh, Pfau & Zeshan's (2005) observation that the "wh-ness" of a wh interrogative clause does not depend on the presence of a wh element (chapter 4). This fact will be discussed later in this section.

Branchini & Donati (2007), as already mentioned, argue that PE-clauses are nominalized IHRCs, but not correlatives. They also argue that these clauses are left extraposed. As discussed in §5.1.3, they propose that PE is a determiner-like element. In Branchini & Donati's view, thus, PE is merged with the head noun in the subordinate clause and then raises rightwards to a C° head endowing the whole clause with nominal features and acting as a nominalizer. In this way the position and the function of PE are explained and, at the same time, an account is given for the coreference between PE and the noun. The clause is then left-extraposed. Thus, the account proposes a mixed structure where rightward movement co-exists with leftward movement.

This analysis, however, presents some problems, in my opinion. First, while nominalized clauses do exist in many languages, it seems counterintuitive that the determiner of one argument of the verb acts also as a determiner-like element of the entire nominalized clause. Notice especially, that PE is able to agree in place (or location) with the internal noun even though it should act as nominalizer of the clause. Second, while the fact that PE-clauses are moved leftwards is not a problem for

the present approach (indeed it proves the need for some leftward movement), the idea that PE moves rightwards to (the specifier or the head of) CP is again in contrast with the possibility of having PE on the left, as it was in contrast also under Cecchetto et al.'s hypothesis. Third, Branchini & Donati (2007:16) assume that the determiner PE moves to the complementizer head so that «the head C° acquires derivationally the status of a head D° (projecting a DP)». Yet, while the final position of determiners could still be accounted for by postulating a Complement-Head-Specifier phrase structure for DP (rejecting antisymmetry), the initial position of other CP elements, such as optional lexical conditional markers in §5.1.2, indicates a Specifier-Head-Complement structure for the CP of LIS and NGT. The hypothesis of a C° head turning into D° and projecting a DP structure is thus untenable in my opinion.

In Brunelli (2007, 2009), it is proposed that the CP domain has a Specifier-Head-Complement structure. Cinque's antisymmetric structure (264) is extended to LIS internally headed relative clauses like (230.a), assuming that they are correlatives along the lines of Cecchetto et al. (2004, 2006). The sign PE is taken to accompany the internal head as a quantifier. However, in principle it could also be a demonstrative (along the lines of Branchini & Donati) given that both quantifiers and demonstratives are postnominal in LIS (see chapter 2). According to Brunelli's (2007, 2009) hypothesis, in these relative clauses the external head does **not** raise and is cancelled by the internal head which has moved leftwards into [Spec;CP$_1$] together with PE. The relative construction displays thus the linear order *int.head+PE – RC* as in (230.a). Sentences with clause-final PE as (230.b), instead, are treated as participial structures in which the participial verb acts as an adjective. According to this hypothesis, the adjectival verb resembles English participial forms *the calling boy* or *the broken pen*, but follows the LIS canonical order N-A-Q/Dem with DP-final quantifier or demonstrative (as opposite to the Dem/Q-A-N order of English). This different order would follow from independent properties of the LIS DP, discussed in chapter 2. It is a property of the LIS DP to move the noun before adjectives and to have adjectives before demonstratives and quantifiers.

However, two remarks must be made here. First, while (264) can account for (230.a), it cannot be applied in (236), which has a similar structure. Sentences like (236) show that the head noun COMPETITION and PE are in situ, that is in object position, within the spreading range of the

relative NMM. This also suggests that (230.a) has an in situ PE accompanying the in-situ head noun BOY, in this case in subject position. Therefore, both sentences (236) and (230.a) belong to the group of circumnominal IHRCs. If the internal head and PE are in situ, the idea that the internal head raises with PE to CP_1 cannot be maintained. A different account must then be given necessarily for (236) and most likely for (230.a). Second, assuming the hypothesis of the participial construction, in cases like (230.b) the clause-final determiner PE should close the whole DP (as its English counterpart *the* opens it), not just accompany the internal head noun. Demonstratives (and more in general determiners) occupy the higher parts of DP. They occupy a projection different from those hosting adjectives and numerals, as they are not part of these modifiers. In LIS, demonstratives appear at the end of the DP, following adjectives. Consequently, if the verb were in a participial, adjectival form that relativizes the DP, the determiner PE should occur after both noun and verb. In other words, PE should mark and close the entire DP, rather than being associated with the participial verb that relativizes (and is embedded in) the DP. Accordingly, PE should fall outside the relative NMM that spreads on the verb. In (230.b) no NMM is shown, but sentences (231-234) show that the clause-final PE falls under the NMM. These IHRCs with clause-final PE require then a different analysis which take into account the fact that PE is within the relative clause, albeit displaced from its in situ position. The analysis must also consider that the head noun of these clauses is still in situ so that these final-PE clauses can be considered as circumnominal IHRCs. In fact, recall from §5.1.3, §5.1.4 and §5.2.1 that LIS has final-PE circumnominal IHRCs as well as in situ-PE circumnominal IHRCs. This inference is in line with Branchini & Donati's (2009) view that none of LIS IHRCs are correlative in the sense of Cecchetto et al. (2004, 2006).

The first observation entails the possibility that in in-situ-PE circumnominal IHRCs, the sign PE and the internal head noun do not move or move as part of a bigger chunk, namely IP_{REL}. This leaves their position unchanged with respect to the surrounding elements. The second observation implies, that in final-PE circumnominal IHRCs, PE is extracted alone from its merge position near the internal head noun, leaving the in situ internal head within IP_{REL}.

At this point, starting from an antisymmetric derivation like (264) or (265), a new account is possible. The element PE raises leftwards alone

and is subsequently crossed over by leftward remnant movement of the whole restrictive-marked IP_{REL}, i.e. the remainder of the relative clause. This yields final-PE IHRCs, where PE is part of the relative clause (rather than closing the relativized DP) and bears the relative NMM. In contrast, if the whole IP_{REL} raises without previous PE-extraction, or, alternatively, if no raising occurs at all, in situ-PE IHRCs are derived. The sign PE bears the relative NMM and occurs in situ, close to the internal head noun. The two derivations differ minimally from each other, as expected. Both derivations also differ minimally from the one proposed for EHRCs and correlatives. The two derivations are represented in (266) and (267). In (267) the "extract-PE" account derives final-PE (circumnominal) IHRCs and is compared to the derivation of EHRCs. In (266) the derivation proposed for in situ-PE (circumnominal) IHRCs is compared to the derivation of EHRCs. The differences are discussed in detail in the pages that follow the figures. However, bear in mind since now that the peculiarity of EHRCs is that they involve also the raising of the external head, rather than having just movement of the relative clause or extraction of PE and remnant movement of the clause.

266. IHRCs with in situ-PE: IPrel remains in FP or possibly moves to CP**₁** with PE in situ; relative NMM [+tense eyes] assigned by F° (compared to the minimally different EHRCs derivation)
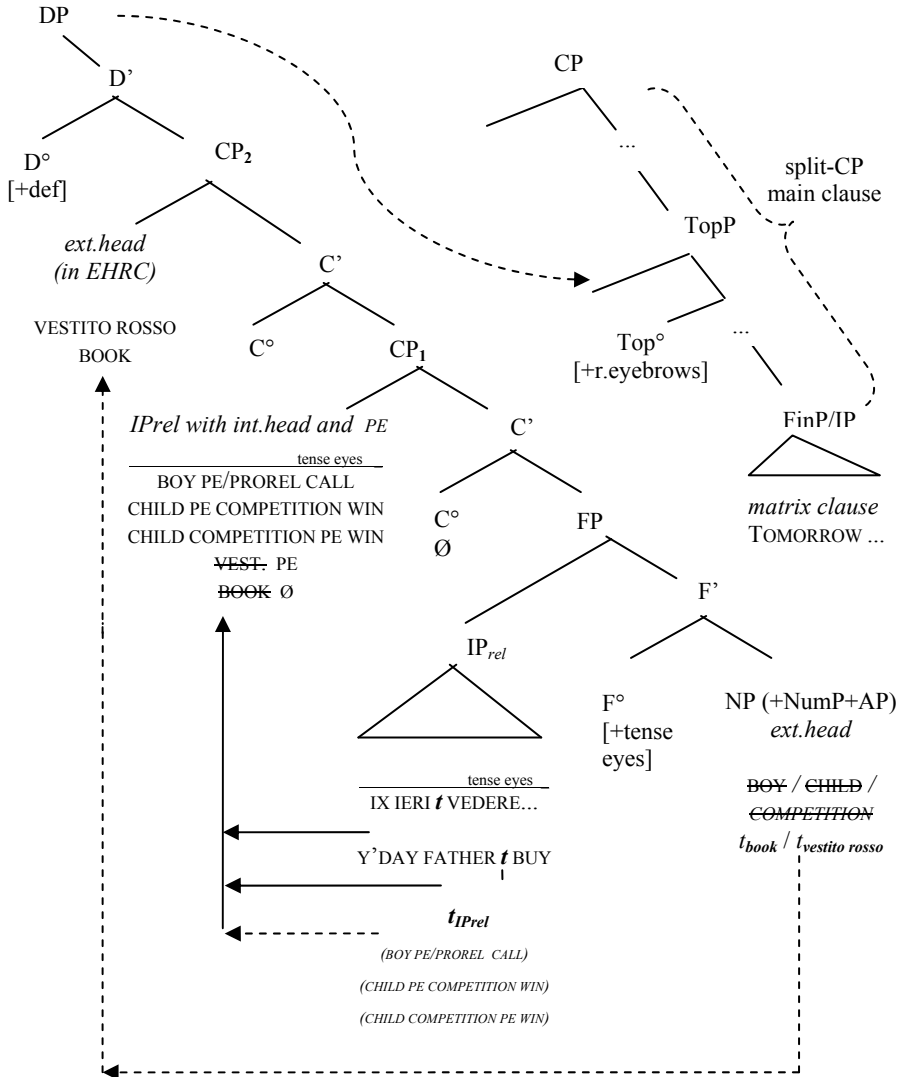
267. Final-PE IHRCs: PE (if any) raises alone; rel. NMM [+tense eyes] assigned by F° (compared with the minimally different EHRCs derivation)
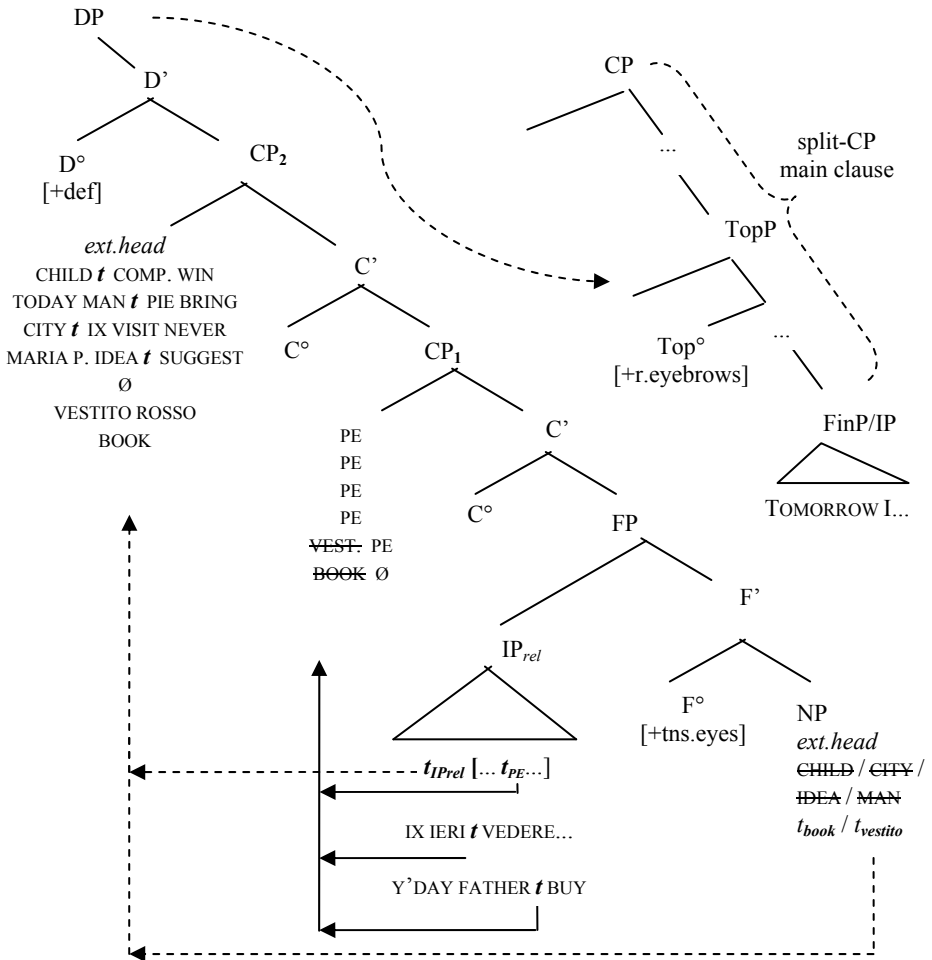
In (266), the whole IP$_{REL}$ clause stays in FP or, alternatively, raises without any changes, dragging along the internal NP in situ and the in situ PE. Under this view, the difference between EHRCs and IHRCs lies in whether both heads raise or only IP$_{REL}$ raises. If IP$_{REL}$ raises, its in situ internal head identifies and deletes the external head, which has not

moved, thus yielding (230.a), (235) and (236). In contrast, when both heads raise, the external NP is higher than the internal one which is so identified and deleted as in (240.a), (240.b), (241). A minor difference derives from whether PE is merged with the internal head as in (240.b) or is replaced by ø as in (240.a) and (241). If PE is present, it appears in the position of the internal head, thus preceding the remaining IPrel. Another possibility is that no raising occurs at all in these IHRCs. In this case, the difference with EHRCs lies in whether both heads raise or no head raises.

In contrast, in (267) the difference between EHRCs and IHRCs lies in whether both heads raise, with PE possibly accompaning the internal head, or PE raises alone followed by remnant movement of IP_{REL} across it. If PE moves alone and is crossed over by the the remaining IP_{REL}, the in situ internal NP identifies and deletes the external NP which has not moved, while PE remains stranded clause-finally as in (230.b), (231), (232), (233) and (234). In contrast, when both heads raise, the external NP is higher than the internal NP, which is identified and deleted as in (240.a), (241). Again, the sign PE (if present) is still visible in the position of the raised internal NP thus possibly preceding the remainder of IP_{REL} as in (240.b), when the internal head is deleted by the external head.

In both derivations, in (266) and (267), IP_{REL} bears the "tense eyes" NMM because it is merged in [Spec;FP], where the NMM is assigned under spec-head agreement with F°. The "tense eyes" NMM, is taken as the overt effect of the functional head in the specifier of which the (restrictive) relative clauses are merged, given that it appears on the restrictive part of externally headed relative clauses and on IHRCs, which Branchini & Donati have shown to be restrictive. In fact, in Cinque's view, restrictives and appositives are merged in different projections, so that a clause being restrictive does not derive from the movements that it possibly undergoes, rather from its being merged in a specific restrictive relative projection. Granted this, it is not surprising that the restrictive marker "tense eyes" is an inherent property of the head of the functional projection where restrictive clauses are merged. Also, this hypothesis accounts for the NMM being independent form PE. This sign does not determine the spreading of the NMM, but, in contrast, it bears the "tense eyes" NMM as a consequence of its position in FP as part of IP_{REL}. Thus, PE is able to bear different nonmanual markers, "tense eyes" in restrictive relative clauses or no relative NMM in (250), because it can be merged in different projections of DP, namely in FP or DemP. The fact that PE is

optional must have an independent motivation that I am not able to explain at this point. It may pattern with English *that/who(m)* alternating with *ø*, as in *The man (that/ø) I met yesterday*. However, more research is needed to compare the distributional pattern of these elements. Assuming that the "tense eyes" restrictive relative NMM is the overt manifestation of spec-head agreement in a dedicated functional projection is entirely analogous to Pfau's (2006, 2008a) assumption that topic and imperative NMMs are encoded in dedicated projections (see chapter 4). It is also analogous to Aboh & Pfau's (2011) assumption that interrogative NMMs are assigned under spec-head agreement in InterP (an hypothesis which I revised slightly proposing a dedicated WhP in chapter 4).

Some sentences must still be discussed. This group, which I have labelled "other LIS cases", includes sentences with clause-final PE, but external head, as indicated by the spreading of the NMM in (237). Instead of PE, a strong demonstrative index DIX++ can appear as in (242). In (238) the object CITY precedes the subject index. Notice incidentally that, while the possibility of replacing PE with a strong demonstrative strengthens the hypothesis that PE is a demonstrative (contra Brunelli's (2007, 2009) quantifier analysis), demonstrative movement alone (either rightwards or leftwards) is not sufficient to explain the position of the head noun, at the left of its own canonical position (thus contrasting with derivations based only on PE movement). Finally, the group "other LIS cases" includes also sentence (239) where the relative NMM is restricted to the sign PE only.

From a theory-internal point of view of "pure mechanical derivation", (237) and (242) require an additional projection to account for the fact that remnant movement of IP$_{REL}$ strands PE/DIX clause-finally and yet targets a position below the external head (which is outside the NMM and to the left of the relative clause). Assuming that movement is only leftwards, PE or DIX++ is extracted alone to the first CP, followed by remnant movement of IP$_{REL}$ which strands it clause-finally. At this point, the external head moves further above IP$_{REL}$ and subsequently identification and deletion of the internal head occurs, as with other EHRCs. This amounts to saying that two CP projections are not sufficient because the projection where PE/DIX extracts to must have two other projections above itself: one landing site for the remnant movement of IP$_{REL}$ and one landing site for the external head. Cinque (2003, 2008)

indeed assumes three CPs[107], although the first one hosts the whole IP$_{REL}$, rather than hosting just a demonstrative or quantifier as proposed here. However, the question arises as to why should as many as three CP projections be necessary, except for pure theory-internal requirements. One projection hosts the external head noun. Another projection hosts the internal head noun or the IPrel that contains it. However, what is the role of the third hypothetical projection? It must be motivated by specific features in order to avoid unmotivated proliferations of projections.

Unfortunately, I can only offer some tentative suggestions, which require further investigation. To begin with, notice that the proposal of three different CPs has been already put forward for independent reasons in relation to Dutch embedded interrogative clauses and relative clauses (Hoekstra 1993; Zwart 2000). I do not discuss those proposals here, but I take them as independent evidence that more than two CP projections are somehow required.

At this point, I would like to draw attention to some similarities between restrictive relative clauses and wh interrogative clauses in LIS. First, as discussed earlier in this section, the "restrictiveness" of a relative clause is independent from PE just as the "wh-ness" of an interrogative clause does not depend on wh elements (see chapter 4). It is for this reason that I assume the NMM "tense eyes" to be assigned in Cinque's FP projection dedicated to restrictive relative clauses, as I assume the wh NMM to be assigned in a dedicated WhP in chapter 4. Second, the distribution of PE (final or in situ) in IHRCs is reminiscent of the distribution of wh elements (final or in situ) in interrogative clauses. Third, PE can be clause-final, split from the in situ noun as some complex wh-phrases can be split into a final wh sign WHICH and an in situ NP (chapter 4). Only the clause-initial PE seems not to have a clear clause-initial wh interrogative counterpart. Given the striking intralinguistic variation encountered in LIS wh clauses, it seems no coincidence that the

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[107] Apparently, one position can be "gained" within the two-CPs hypothesis, taking PE in (237) as a realization of the head C° in (266) and assuming that IPrel moves to [Spec; CP$_1$] and is crossed over by the external NP in [Spec; CP$_2$]. However, this cannot apply to the strong index in (242), which is clearly a demonstrative or a pronoun, hence a specifier (recall chapter 2). On the other hand, the word order and the spreading of the NMMs cannot be accounted together under (267). In fact, in both (237) and (242), [Spec;CP$_2$] is already occupied by the external head without NMM. The remaining CP$_1$ can host a moved PE or index, but these should then appear clause-initially since there is no landing site for inverted material.

same variation is observed also in relative clauses. In addition to this, recall that the sign PE belongs to a group of G-handshaped emphatic forms (Romeo 1997: 84-85). In fact, under certain circumstances it can be even replaced with a strong, reduplicated demonstrative DIX++, as in EHRC (242) which I will discuss later. Aboh & Pfau's (2011) proposal that the wh element is extracted to a focus position is relevant here. On the basis of this assumption, different orders of signs are derived in chapter 4 depending on whether:

- the wh element raises with the NP;
- the wh element raises alone (plus remnant movement of the NP)
- the wh element does not raise (or alternatively raises with the whole interrogative clause).

Given the similarities between the distribution of PE and that of wh elements, it is plausible to suggest that the same mechanism is at work in the two constructions. The movement of PE is related to focus features. The different positions of PE in relative clauses depend on how the movement occurs:

- PE raises together with the head noun;
- PE raises alone (followed by remnant movement of IP_{REL} containing the head noun);
- PE does not raise (or, alternatively, raises with the whole IP_{REL}).

This hypothesis does not only account for the similarities between restrictive relative clauses and wh interrogative clauses, but also explains why an emphatic, reduplicated demonstrative (DIX++) can occur in place of PE. The presence of Foc/Top features in relative clauses is suggested also by some Bulgarian data in Krapova (in press). Hopefully, research on this issue may bring support to the present hypothesis about PE. The specific feature of EHRCs is that the external head noun also raises. This idea will be further discussed later. Incidentally, correlative relative clauses, if they were attested in LIS, could be derived from PE raising with the internal head, as EHRCs are, except that no raising of the external head occurs. However, recall that correlative clauses are not attested in LIS, according to Branchini & Donati's (2009) analysis.

According to the hypothesis outlined above, one CP position is reserved for focalized material, one hosts the internal head (or the remnant IP_{REL} containing the internal head) and the highest one is the possible landing site for the external head. Movement to the first CP would then be movement to a focus position. In (237) and (242) only the

determiner PE or DIX is focalized, followed by remnant movement of IP$_{REL}$, containing the in situ internal head noun. This strands PE/DIX clause-finally. As said, the only difference with final-PE IHRCs is that at this point also the external head noun raises, triggering indentification and deletion of the internal head and yielding the final-PE EHRC with the order *ext.head – RC [...~~int.head~~ t$_{PE}$ ...] – PE/DIX*. If the determiner raises with the internal head, the following raising of the external head yields initial-PE EHRCs. If the internal head raises with IP$_{REL}$ after extraction of the determiner, but the external head does not move, final-PE IHRCs result with an in situ head noun. If nothing is focalized, or only the whole IP$_{REL}$ does, in situ-PE IHRCs result with an in situ head noun.

Given the proposed presence of focus features, a further question arises now as to whether topicalized relative clauses have then one and the same element bearing both focus and topic features at the same time. In fact, given these derivations, relative clauses may contain a focalized element that would bear also topic features when the whole DPrel is topicalized in the main clause. That a certain element undergoes topicalization and focalization may appear contradictory. In my opinion, there are some reasons to hypothesize that focus plays a role in relative constructions. Alternatively, it is possible to conceive that at least contrast plays a role.

Concerning the first hypothesis, since focalization and topicalization of one element are established with respect to other pieces of information, it is not impossible that the same element is focalized with respect to the subordinate, relative clause and yet topicalized with respect to the matrix clause. Even more so, if we consider that relative constructions consist of two clauses, main clause and relative clause, which may package information independently from each other as they refer to distinct events/situations. We can see this if we present the two clauses separately, that is, if we keep the two clauses as two separate sentences. A relative construction as *Tomorrow I will read the book that my father bought yesterday* can be split into two sentences: *My father bought a book yesterday. I will read that book tomorrow*. In the first sentence, *book* is new information. In the second one it is known, given information, as indicated by the anaphoric demonstrative *that*. As such, *that book* can be also topicalized: *My father bought a book yesterday. That book, I will read tomorrow*. Crucially, the given information contained in the DP *that book* is not simply 'book', but corresponds to a specific book, namely

'book bought yesterday'. 'Book' is not given information per se. In other words, the given information of the DP of the second sentence corresponds to the whole first sentence. If we link the two sentences in a relative construction, the first sentence becomes the relative clause and is given information for the second sentence, which becomes the main clause. Within the first sentence, which becomes the relative clause, one element is new information with respect to the other elements. More precisely, the main clause would contain a topicalized, given DP$_{REL}$ within which one element is new information with respect to other elements, that is, is focalized.

Alternatively, rejecting this hypothesis, another explanation is possible, still based on the parallelism between relative clauses and interrogative clauses. In chapter 4, it is argued that focalization gives prominence to the relevant element, to which interrogativity applies (e.g. which time vs which place; the subject vs the object etc…). Along the same lines, focalization would serve a similar purpose in relative clauses, giving prominence to the element to which identification applies. In my opinion, this operation implies a kind of contrast between different elements of a set. Identifying the book of the second clause with the book of the first clause, entails that all other possible books are discarded. In other words, a relative construction as *Tomorrow I will read the book that my father bought yesterday* can be rephrased also as: *My father bought a book yesterday. That very book (not others) I will read tomorrow*. In this perspective, both wh interrogative and restrictive relative clauses entail a sort of contrast. Accordingly, the focus feature triggering wh raising in Aboh & Pfau (2011), which I extend to PE raising here, could be a feature of contrast, instead. In saying so, I am also sharing Frascarelli & Puglielli's (2007) and Frascarelli & Hinterhölzl's (2007) claim that contrast features are distinct from both topic and focus. On the basis of Italian and German data, they argue convincingly that contrastive features can be added to both topicalized and focused information and that contrast is associated with a specific projection in the left periphery[108]. Granted this, topicalized relative clauses would not have any clash of topic and focus features because they would involve only contrast and topic features, which can co-exist. However, this hypothesis remains at the level of speculation. Whether and to which extent focus or

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[108] Concerning this, see footnote 92 in § 4.2.3.

contrast features really contribute to the parallel derivations of wh interrogative clauses and relative clauses is an issue which I leave open for future research.

Along similar lines, one may want to find a parallelism between Cinque's highest CP projection, which hosts the external heads of relative clauses, and the high projection for disjunctive operators of interrogative clauses discussed in chapter 4. According to this hypothesis, the external head of relative clauses raises to the high projection to check definiteness/specificity features, which, in my opinion, entail no/zero disjunction. In fact, in my opinion, disjunction amounts to absence of identification, because a number of alternative choices are possible to identify a referent. In contrast, definiteness/specificity represents the maximum degree of identification, that is, absence of disjunction. In chapter 4 it is argued that the highest projection (there labelled WhP) of the interrogative zone encodes infinite disjunction in wh interrogative clauses. It is possible that the external head of relative clauses raises to the highest CP projection of the relative clause zone, which encodes zero disjunction. This approach would make it possible to subsume one and the same high projection for both relative clauses and interrogative clauses. Of course we are in the field of conjecture. The effectiveness of this hypothesis is a something to explore in future research.

In contrast, LIS sentences such as (239), where the rel NMM appears only on PE, cannot be explained under the present analysis. The sentence is repeated as (268) here. As seen in §5.1.3, §5.1.4 and previously in this section, LIS data suggest that the nonmanual marker is assigned independently of the presence and the position of PE. Under the assumption that at least the restrictive "tense eyes" component of the "rel" nonmanual marker is assigned to IP_{REL} because it is merged in [Spec;FP], this sentence would imply that PE is merged alone within IP_{REL}, as in a reduced relative clause, while the rest of the clause is outside. At the same time, the "raised eyebrows" NMM that Branchini & Donati (2009) report to constitute "rel" and that we have seen to be a topic marker suggests that PE is topicalized. Since we have seen that topics marked with "raised eyebrows" cannot occur to the right of their clause, this topicalized PE is not part of the first clause, or else it should be a right-peripheral topic. However, PE can well be a topic fronted to the left of the second clause. This amounts to suggesting that (268) is split in three parts and corresponds roughly to (269).

268.   rel   [LIS: repeated from (239)]

ONE WOMAN$_i$ MAKE-UP NOT PE$_i$ IX MEET NEVER
'I never met a woman who does not wear make-up'

269. One woman does not wear make-up, such/that one (which I have just mentioned), I have never met

I have no conclusive evidence for this hypothesis, however. Especially, in such case, prosodic breaks should be visible, which, however, are not reported. On the other hand, assuming that PE assigns the "tense eyes" NMM does not account for the fact that this nonmanual marker also appears in other relative clauses when PE is absent. It also does not account for the fact that the NMM occurs independently from the position of PE. In addition to this, the position of the raised-eyebrows-marked PE would be unexplained, as it cannot be derived with rightward movement, given that topics with raised-eyebrows cannot occur to the right of the clause. Thus, I maintain the assumption that PE does not assign the "tense eyes" NMM nor the "raised eyebrows" NMM. I claim that "tense eyes" are assigned in FP to (a possibly reduced) IP$_{REL}$. I also claim that the "raised eyebrows" NMM appears because topicalization occurs after relativization. I leave the issue of (239.a) = (268) for further research. Notice that also sentence (238) remains unexplained. One possibility is to assume that CITY is in situ, and the subject IX is one of Bertone's (2007) clitics occupying a position close to the verb, distinct from the position of strong pronouns. Bertone (2007) discusses the existence and the different properties of strong, weak and clitics indexes in LIS. She shows that these categories of pronouns have distinct distributions. In particular, she shows that LIS clitic pronouns cannot be separated from the verb. A clitic subject pronoun must immediately precede its verb. This implies that, unlike full NPs and strong pronouns, clitic subject pronouns must follow a full NP object, although they precede the verb. Taking this perspective, a clitic subject IX would follow the object CITY in (238) even though this object is in situ. Sentence (238) would then be a final-PE IHRC with in situ (object) head noun. The apparently unusual position of the head noun with respect to the subject would derive from independent properties of the subject itself (it is a clitic), not from a specific behaviour of the head noun. Unfortunately, I

have not been able to determine the status of the subject IX. Consequently, I cannot propose a reliable analysis for this sentence. I restrict myself to the observation that the distribution of PE and the NMM contrast with those observed in all other examples.

In conclusion, apart from these few cases, the vast majority of instances of alleged rightward movements in the CP of LIS and NGT seems to be able to be reduced to one property, namely focus or contrast, while all the rest of CP-related phenomena, as topics, imperative clauses, interrogative clauses, conditionals and external head of relative clauses can be derived with leftward raising.

5.3 Conclusions

Conditionals can be easily accounted for in LIS and NGT, with a split-CP à la Rizzi, antisymmetrically ordered with a Specifier-Head-Complement structure. According to the present analysis, conditional subordinate clauses undergo topicalization so that their distributional properties follow the same pattern as that of other topics. The restrictions observed on conditional subordinate clauses follow the restrictions that allow topics to stack to the left of the main clause while preventing them from appearing on its right. Moreover, conditional clauses bear the same "raised eyebrows" NMM that marks topicalized constituents. The fact that conditional clauses and other topics are not allowed to follow the (main) clause in LIS and NGT appears then to derive from independent properties of these languages, which still need be investigated. These restrictions, albeit still unexplained, support the hypothesis that conditionals and topics behave alike with respect to the (main) clause and also fit in with the assumption that raising movements are only possible toward the left, as predicted by an antisymmetric structure with Specifier-Head-Complement configuration. In principle, then, Rizzi's split-CP hypothesis, with topic projections to the left of the main clause (above InterP), is able to explain the distribution of conditional clauses in these languages, although more research is required to determine if their topic projections are freely recursive or encode distinct features. Also the fact that conditional clauses in both LIS and NGT can be optionally introduced by clause-initial elements IF/SUPPOSE, as in languages with [Spec;CP] on the left (such as Italian or English), supports the view of a structure with specifiers on the left, rather than a structure with specifiers

on the right. It thus supports (indirectly) the point of view of antisymmetry.

With relative clauses, things are a little more complicated. I have analysed only restrictive relative clauses, not appositive ones. Nevertheless, the data reveal considerable crosslinguistic and intralinguistic variation. Most LIS EHRCs and (circumnominal) IHRCs can be accounted for on the basis of Cinque's (2005, 2008) unified structure underlying different relative clauses of different languages. The analysys of LIS EHRCs is also based on the similarities between LIS and DGS relative clauses. In Cinque's approach relative clauses involve the double merging of the head noun: as external head in the relativized DP_{REL} and as an internal head in the subordinate IP_{REL} embedded in this DP_{REL}. The different relative constructions emerge then as the result of different raisings which lead to identification and deletion alternatively of the internal or the external head, with the internal head being either in situ or raised outside the subordinate. For most LIS and NGT relative clauses, a simplified structure à la Cinque with two CP projections is sufficient. Relative clauses in LIS can be derived under the assumption that LIS PE is an anaphoric demonstrative raised from within the subordinate clause (but still within the relativized DP). The raising of PE in LIS relative clauses patterns with the raising of wh elements, especially WHICH, in interrogative clauses. Both PE and WHICH can remain in situ, within IP_{REL} or the interrogative clause respectively. Alternatively, both can be extracted alone, followed by remnant movement of the clause which strands them in final position. Both of them can also raise together with the noun which they accompany, namely with the NP in complex wh-phrases and with the internal head noun in initial-PE EHRCs. The only difference is that in EHRCs also the external head noun raises and deletes the internal one. In fact, the distribution of signs in LIS and NGT (and DGS) and that of LIS NMMs supports Cinque's view of a position for the external head, distinct from the one hosting the internal head and to the left of the relative clause, which is Cinque's IP_{REL}. Notice that, in principle, according to the present account, PE would raise together with the internal head noun even in correlative IHRCs (if any). However, these are not attested in LIS according to Branchini & Donati (2009).

However, deriving the sign order of other LIS cases require the assumption of a third CP projection, as suggested in Cinque (2008). I have then made some tentative speculation about the possible reason for

an additional projection. Basing on the observed parallelism between the highly varying distribution of wh elements and the equally varying distribution of PE, I argue that one projection is comparable to the focus projection proposed for wh interrogative clauses (and extended to polar interrogative clauses) in chapter 4. Consequently, I argue that this projection of relative and interrogative clauses may have to do either with focus features (Aboh & Pfau 2011) or, at least, with contrastive features (under Frascarelli & Hinterhölzl's (2007) assumption that contrast is a feature independent from topic and focus).

Both these hypotheses need to be verified in future research on the distribution of focalized and contrasted constituents in LIS and NGT. However, the fact that focus/contrast features are assumed for independent reasons in a number of other constructions in different languages should avoid an unmotivated proliferation of projections. A further possibility to explore is that the highest of Cinque's CP projections of the relative clause zone corresponds to the high WhP projection of the interrogative zone.

The core of Cinque's proposal, however, lies in the assumption that the relative clause is merged within the DP above the noun and its numerals and adjectives. Restrictive relative clauses are merged under DemP and appositive relative ones are merged above QP. From this perspective, the existence of postnominal restrictive relative clauses in LIS is in line with its having "rolling-up" pied-piping movements inside the DP, as discussed in chapter 2. These pied-pipings raise the noun to the left of the relative clause, also dragging along other elements. Within the present framework, this suggests that the noun raises across the relative clause, piedpiping the adjective. In LIS, both the adjective and the relative clause follow the noun as, for instance, in (248.a). However, their N-A-RC order is again in line with the assumption that noun and adjective raise together above the restrictive relative clause. The noun pied-pipes the adjective with inversion obligatorily in LIS. As with conditionals, different nonmanual markers accompany relative clauses in this language. In particular, LIS relative clauses bear the "tense eyes" NMM observed on conditional clauses. However, at the same time, the crosslinguistic comparison of data suggests that the relativized DP, i.e., the DP containing the relative clause that modifies it, can be merged in the matix clause either in canonical argument position or in topic position.

In LIS (as in DGS), the "raised eyebrows" NMM, which marks topics, is layered onto the DP (and the relative clause) when it is topicalized.

The vast majority of the cases discussed in this chapter are compatible with Cinque's antisymmetric derivation. However, some few residual relative clauses remain unexplained. In addition to this, the combination and the (possibly different) functions of the NMMs must be still investigated in order to reach definite conclusions. Also the status of the LIS demonstrative PE requires further research before a full-working account can be proposed for LIS relative clauses.

Nevertheless, even though some LIS relative clauses are not covered by the present antisymmetric account, they remain the only case that requires rightward movement, given that topics, conditionals and final-wh interrogative clauses pattern with leftward movement constructions attested in Spec-Head-Compl structured spoken languages (see this chapter for conditionals and chapter 4 for a discussion of topics and the clause-final position of wh elements). In general, even if one were to reject antisymmetry, all instances of rightward movement in the CP of LIS seem to be able to be reduced to one property (of focus or contrast) affecting both LIS and NGT wh questions and LIS relative clauses. Even taking such a perspective, the issue would concern only some wh and some relative clause. This appears not sufficient, in my opinion, to assume a head-final branching structure of the CP domain.

Before concluding this chapter, I would like to make some speculations about the fact that LIS conditional protases and restrictive relative clauses share the "tense eyes" NMM, as well as the "raised eyebrows" NMM. Also, other similarities between relative constructions and conditionals exist, which involve both LIS and NGT. Notice that the signs for IF of the two languages (Italian SE in Romeo (1997:129, 136), Dutch ALS in www.kegg.nl/egg_gebaren.php) share the handshape-1, also called handshape-G (✋). They also share a "lateral" movement, somehow orthogonal to the axis of the forefinger, instead of the usual pointing movement of pronouns and demonstratives[109]. They have a single and nonrepeated, "resolute" movement similar to the one of the sign PE of LIS. Concerning LIS, Radutzky (2002:187.1) describes a variant of IF

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[109] Although LIS IF and NGT IF are different from each other, neither of them moves in the direction indicated by the tip of the index finger. Rather, both move toward the direction indicated by the outer side of the finger (the side that is far from the signer), as the pictures show.

with reduplicated movement, in addition to Radutzky's (2002:459.1) and Romeo's (1997: 129, 136) nonreduplicated IF forms. It appears then that repetition of the movement is optionally possible, albeit not obligatory. Demonstratives and pronouns, too, can be reduplicated optionally, by repeating the movement of their base form. In contrast, as far as I have observed, obligatorily repeated movement (possibly circular as in LIS WHERE) is often associated to the base form of wh signs in LIS and NGT, regardless of the hand configuration. For instance, WHICH, WHERE, WHAT all have a repeated movement in both sign languages[110]. In (270) the NGT sign IF has a downward and forward wrist rotation, while the LIS sign IF lacks rotation and moves forwards and slightly upwards. Despite this difference, the characteristics of these signs suggest that they have some "definite" feature like LIS PE and are not suitable for interrogative constructions. In fact, I have not found any occurence of interrogative clauses containing these signs, in the literature. In (270), the signs IF of LIS and NGT and the LIS sign PE are sketched and compared.

270. Comparing LIS and NGT signs 'if' (SE/ALS) and LIS PE
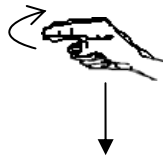
    a. IF (LIS)   b. PE (LIS)   c. IF (NGT)
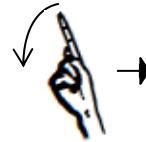
It is no new observation that conditionals and relative clauses display similiarities. In fact, the relevant feature of conditionals is that they have an operator (Bhatt & Pancheva 2005; Arsenijević 2009; Haegeman 2009a, 2009b) instead of the "usual" internal head. In other words, conditional clauses are "world-restrictive" relative clauses containing a world operator. Roughly speaking, they restrict a situation, a possible world (among all conceivable worlds) to the one where a specific condition occurs. It is thus attractive to extend Cinque's unified account for relative clauses also to conditionals. In such a perspective, the "tense eyes" NMM

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[110] Not all wh signs contain a repeated movement (LIS/NGT WHO, LIS WHY). However, also in spoken languages, not all wh signs contain a wh part (English 'how').

observed in LIS conditionals would be assigned in a restrictive projection FP, as in restrictive relative clauses. The presence of a topic "raised eyebrows" NMM would indicate that, like (other) relative clauses, these "world-restrictive" relative clauses can be merged in the topic projection of the left periphery of the main clause. This would be in line with the intuition that topicalization takes a (real or imaginary) referent as the center of the predication, that is, as the starting point for determining further information, i.e., the the truth-value of the sentence[111], while conditionals take the truth-value of an(other) event as a starting point for determining further information. The features of sign languages, with their NMMs and signs (which can be decomposed in parameters that highlight parallelisms between functional elements) are evidence that supports a unified theory "Conditional-Relative". The observation, however, remains at the level of speculation until definite conclusions can be reached about the status and the structure of LIS relative clauses and their nonmanual markers.

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[111] By this I mean that a sentence like *As for vegetables, I prefer tomatos* means roughly *'If we now speak/turn to/mean vegetables, I prefer tomatoes*. However, the same statement (I prefer tomatoes) may not be valid if the topic is food in general, in which case the speaker could prefer meat to tomatoes.

Chapter 6. Conclusions and avenues for future research

This final chapter presents a summary and discussion of the conclusions drawn in this dissertation and of the remaining open questions. The applicability of the antisymmetric framework to the analysis of LIS and NGT is evalauted together with the need to motivate independently some projections required in antisymmetric derivations for purely theory-internal reasons.The findings with respect to crosslinguistic variation including also crossmodal variation are summarized. Some counterarguments to antisymmetry, are also briefly presented, mainly on the basis of evidence from LIS. In relation to this I also touch on the application of antisymmetry to some phenomena that were not discussed in the previous chapters, that is SOV order and verbal agreement. Finally, I shall revisit some general issues presented in chapter 1.

In this research, different aspects of LIS and NGT were compared. The areas investigated include the DP domain (order of adjectives, nouns, demonstratives, possessives, numerals), the IP domain (order of verb, aspectual markers, modals, and negation), and the CP domain (topicalization, conditionals, imperative, interrogative, and relative clauses). The aim of this research was twofold: first, to arrive at a comparative description of these two sign languages and second, to establish whether the crosslinguistic variation found among sign languages is constrained by the same language universals hypothesized for spoken languages. Thus, the dissertation aimed at indicating whether the crosslinguistic variation observed in LIS and NGT can be derived from the same order of merge, imposed by an antisymmetric universal deep structure à la Kayne (1994), consisting only of Specifier-Head-Complement branching phrases (see §1.2.3 and §1.4). Data from other sign languages and also from spoken languages were also discussed in the course of this comparison.

It has to be pointed out that the present research does not offer a comprehensive analysis of LIS nor of NGT. It should rather be seen as an attempt to determine whether it would be worth making a more thorough investigation of the applicability of antisymmetry to these sign languages. Nevertheless the the observations made about the attested crosslinguistic variation are valuable in themselves and will be summarized in §6.1. The discussion of the applicability of antisymmetry to LIS and NGT will be

presented in §6.2. In §6.3, I shall discuss the need to motivate the projections required by remnant movement. In §6.4, I will briefly present some counterarguments to an antisymmetric model for LIS (and NGT), along with some further speculations (which require future investigation). General conclusions are presented in §6.5.

6.1 Crosslinguistic variation within DP, CP, and IP

The DP domain (chapter 2) of LIS and NGT displays interesting crosslinguistic variation. Whereas LIS has a strictly postnominal sequence of elements, NGT shows more variation: some elements occur postnominally, others prenominally, and some elements may occur either pre- or postnominally. Thus, the DP-internal elements of LIS appear preferably in the sequence: **N – Poss – A – Num – Dem/Q** (although N-Num-A is also possible). In contrast in NGT, I have observed partial orders that can be summarized in the sequence: **Q/"Other"/Poss/Dem – (N-A-Num)/(Num-A-N) – Loc** (slashes separate elements for which I have not been able to determine a linear order or for which different, alternative orders exist). Apparently, there is no difference in meaning between pre- and postnominal numerals and adjectives in NGT. Postnominal LIS elements occur in the mirror order of prenominal NGT elements. Moreover, the NGT postnominal elements **A-Num** appear in an order which is the opposite of the **Num-A** order displayed when they are in prenominal position. Thus, the two sign languages show crosslinguistic variation comparable to that attested across spoken languages. For instance, English has the same prenominal order of elements (Dem – Num – A – N or Poss – Num – A – N) as NGT, while the analysis of the Standard Arabic DP (Cinque 2000) can be applied to the LIS postnominal order, as will be discussed later. The possibility of having alternative orders of elements within a single language, as observed in LIS and NGT, is attested also in other sign languages (e.g. Taiwanese Sign Language (Zhang 2007)) and, again, in spoken languages (see Cinque (2005a) and references therein).

The CP domain of these two sign languages, too, displays a certain crosslinguistic variation, along with some invariable properties (see chapters 4 and 5). Both the variation and the similarities concern partially the order of signs and partially the so-called grammatical nonmanual markers (NMMs), that is, dedicated facial expressions, body and head

postures which are associated with specific syntactic phenomena. Both LIS and NGT place topicalized elements in a left-peripheral position (i.e. preceding the rest of the sentence) and conditional clauses before the main clause. Also, both languages have an optional lexical conditional marker which appears at the beginning of the conditional clause. Topics bear a "raised eyebrows" NMM in both languages. Conditional clauses, too, have a NMM that consists of "raised eyebrows", although other NMMs are observed, especially the "tense eyes" NMM of LIS. Both languages mark imperative clauses nonmanually, rather than lexically, but in doing so, they employ partially different NMMs. Additionally, imperatives are also manually marked in that the movement of the hands is more tense than in plain declarative clauses.

Interrogative clauses display interesting properties, in that NGT, but not LIS, commonly employs a sentence-final lexical marker "palm up" (PU/Q-PART) which acts as a question particle and which may occur in both wh and polar questions (Aboh & Pfau 2011). In contrast, the two languages pattern with each other with respect to the position of the wh element which is usually clause-final in both languages, although some interrogative clauses with an in situ wh element are also attested. NGT occasionally allows for double-wh interrogative clauses, that is, clauses which contain two wh signs in distinct positions. In LIS, complex wh phrases can split, yielding a structure with the wh sign WHICH in clause-final position and the noun in situ. Interrogative NMMs behave similarly in the two languages, with "lowered eyebrows" marking wh questions and "raised eyebrows" marking yes/no and alternative content questions. In describing the data, it turned out that the "lowered eyebrows" wh NMM is comparable to the lexical general wh marker (G-WH) found in IPSL (Aboh, Pfau & Zeshan 2005) and different from the question marker Q-PART of NGT, which may occur in all types of interrogative clauses. Both LIS and NGT allow, to different extents, wh questions without overt wh phrases, thus patterning with Aboh, Pfau & Zeshan's (2005) and Aboh & Pfau's (2011) observations concerning IPSL and spoken languages, such as Oro Nao. Sign languages, thus, appear to have at their disposal different overt components for forming interrogative clauses: (possible) wh phrases, a nonmanual or lexical marker distinguishing wh from yes/no interrogative clauses, and a possible lexical question marker which encodes interrogativity. Again, the optional presence of three distinct markers is also observed in spoken

languages, crucially in some head-initial languages (see, for instance, Veneto varieties in Poletto & Pollock (2004) and Munaro & Pollock (2005)) where an interrogative-marked verb is sandwiched between a wh phrase and a higher wh element. This latter element can have a specific form or else it reduplicates the first wh element, as observed also in those sign languages that display wh doubling.

Relative clauses indicate even more intralinguistic variation within LIS. LIS has different relativization strategies at its disposal, as is also observed in certain spoken languages (see, for instance, de Vries (2002) and references therein). The order of signs suggest that it may be interesting to investigate whether NGT also has EHRCs. I would like however to reemphasize the point that the data collected for NGT relative clauses may have been influenced by the methodology: unlike LIS, NGT sentences were obtained only on the basis of asking informants for a Dutch-to-NGT translation and the resulting structures are identical to those found in Dutch. Thus, my analysis of restrictive relative clauses addresses only LIS. LIS makes use of both EHRCs and (circumnominal) internally-headed relative clauses (IHRCs). Moreover, LIS, but not NGT, also shows a special sign PE which has been analyzed as an emphatic demonstrative/determiner (Branchini 2006; Branchini & Donati 2009; Bertone 2007; Romeo 1997) which occurs not only in relative clauses, but also in nonrelative clauses. Combining the data reported by different authors, it turns out that PE can occur in both IHRCs and EHRCs and also in different positions within the clause. In addition to this, LIS relative clauses involve the layering of different NMMs, a restrictive "tense eyes" NMM and a topic "raised eyebrows" NMM that marks all topicalized elements. In contrast, in NGT, only the topic NMM is attested, as far as I have been able to observe. The data collected show that conditionals, too, have partially different NMMs, though the conditional subordinate clause appears always to the left of the the matrix clause in both languages. The LIS conditional clause has a topic NMM, a "tense eyes" NMM and "tense cheeks", just like relative clauses, plus a "forward head tilt". The NGT conditional clause is accompanied by the topic NMM plus "head forward", "head tilt", and "chin lift". That is, the LIS conditional NMM is very similar to the relative NMM. Also, some lexical conditional markers of both LIS and NGT share similarities with the LIS demonstrative PE, which can occur in relative constructions. This suggests that LIS and NGT treat conditional clauses as (subtypes of)

relative clauses – a possibility which awaits further investigation (see Bhatt & Pancheva 2005; Arsenijević 2009; Haegeman 2009a, 2009b).

Some differences appear also in the order of signs within the IP domain of the two sign languages (chapter 3). These differences are reminiscent of the crosslinguistic variation observed within DP. LIS IP elements, in particular aspectual and modal markers, have a strictly postverbal order whereas NGT shows a higher intralinguistic variation, with either pre- or postverbal modals, along with postverbal aspectual markers. Notice that in this dissertation only synthetically inflected verbs (so-called agreeing verbs and spatial verbs) have been considered in the analysis of IP. In addition to this, some aspectual markers (e.g. reduplication) incorporate[112] in the verb as movement-altering affixes, rather than as lexical elements. Consequently, they do not appear in any linear order. However, even though the data are partial, LIS clearly displays the orders $V – Asp_{celerative/durative} – Asp_{perfect}$ and, more generally, $V – Asp – Mod$. NGT shows the order $V – Asp_{celerative/durative} – Asp_{perfect}$ and both $V – Mod$ and $Mod – V$ orders. In both languages, agreement markers, crucially subject agreement, appear on the lexical verb, rather than on modals, aspectual markers, or tensed auxiliaries. Consequently, subject agreement appears in most cases to the left of other elements, given that the verb usually precedes them (apart from some Mod-V sequences in NGT). Negation in LIS is obligatorily lexical (manual) and accompanied by a nonmanual marker, whereas negation in NGT is only nonmanual. In LIS, negation is marked by the obligatory clause-final sign NOT and accompanied by a "headshake" NMM (Geraci 2005), whereas in NGT, it is marked only by the obligatory "headshake" NMM (Coerts 1992; Pfau & Bos 2008). Negative elements such as NOBODY, NOTHING, NOT-YET are attested in both languages and their distribution interacts with the spreading of NMMs. In LIS, the NMM spreads between the position of the negative sign and the end of the clause. Thus, when the negative element is final, the NMM occurs only with this element; when it is in situ, the NMM accompanies the last part of the sentence containing the negative element. The same phenomenon has been

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[112] Recall that I use the words "incorporate" and "incorporation" to indicate that in the surface order of elements, an affix appears as an integral part of a sign, rather than occurring detached from it. I do not necessarily refer to the syntactic process that gives rise to this phenomenon.

observed in NGT sentences with in situ negative elements, although I have no examples of clause-final negative elements in this language.

In conclusion, although more descriptive work is necessary in order to allow for a more detailed comparison of these sign languages, the data presented are sufficient to prove that sign languages show as much crosslinguistic variation as spoken languages. It is important to mention that their use of space for morphosyntactic purposes, especially for verbal agreement, may be a possible counterexample to this claim. As pointed out in §1.1.3, §1.1.4 and §3.1.1, both LIS and NGT inflect some verbs synthetically by changing the start- and endpoint of their movement to make them match the locations previously assigned to the verbal arguments. Given that this is a widespread phenomenon across sign languages, it is tempting to conclude that no variation occurs in this domain, in contrast to the strikingly different inflectional systems attested across spoken languages. However, according to Marsaja (2008), there is at least one sign language, Kata Kolok, which has no synthetic inflection at all, that is, its verbs always retain their base form. Furthermore, some interesting crosslinguistic variation is observed even between LIS and NGT in the context of plain verbs. These lack synthetic inflection and the two languages resort to different analytic strategies (as described in §3.1.1). LIS makes use of indexical pronouns (possibly weak or clitic pronouns according to Bertone's (2007) classification). NGT can use the agreement auxiliary sign glossed as OP or ACT-ON (Bos 1994), the sole function of which is to take over the inflection prevented from attaching synthetically to the lexical verb. I have not been able to establish whether the NGT sign OP always acts as the counterpart of LIS clitic/weak indexes or whether there are also other strategies available in NGT. However, the fact remains that LIS has no OP-like auxiliary. In light of these patterns, it appears that some variants occur less often in sign languages, rather than being completely excluded. The alleged similarities between sign languages appear then to be even fewer than expected at first sight, thus providing some evidence against Meier's (2002) Variation Hypothesis.

6.2 Applicability of antisymmetry

This section summarizes the conclusions drawn in previous chapters with respect to the applicability of antisymmetry to the DP, IP, and CP domains of LIS and NGT.

The orders of signs observed within the DP of LIS and NGT are compatible with the universal Specifier-Head-Complement ordered deep structure and the universal merge order **Q–Dem–Num–A–N** proposed by Cinque (2000, 2005a, 2008b) in the spirit of Kayne's (1994) theory of antisymmetry. Cinque proposes that orders different from this universal merge order result from successive "rolling-up" movements which involve raising of the NP followed by remnant movements that successively pied-pipe lower constituents across higher ones, thus inverting the elements. First N moves across A, then N-A raises across Num (thus yielding N-A-Num), and so on. Cinque refers to these movements as pied-piping of the *whose picture* type. Partial orders derive if some raising does not occur (e.g. A-N-Num if only A-N moves across Num) or if the noun raises alone without subsequent pied-pipings (such as N-Num-A).

As already mentioned in §6.1, the order of LIS adjectives, numerals and demonstratives is the same as the the order discussed for Standard Arabic by Cinque (2000) and was derived in Bertone (2007) by means of a sequence of inverting pied-pipings. In addition to this, the data show that the position of LIS possessives is the same as in the construct-state of semitic languages. Then, the full derivation of the LIS DP-internal order of elements is obtained in chapter 2 by following step-by-step Cinque's (2000) derivation for semitic languages, based on pied-pipings. In contrast, the order of signs within the NGT DP can be accounted for by assuming a partial presence of pied-pipings which can raise the noun and the adjective to the left numerals; this operation is, however, optional. I have not been able to find out what motivates this optionality. The fact that alternative DP-internal orders have also been described for Taiwanese Sign Language and some spoken languages (as mentioned in §6.1) suggests that this optionality does not depend on specific properties of NGT nor on the visual modality. Moreover, although it may be surprising to have two different, apparently unmarked, orders within a single language, the possibility of having elements in either postnominal or prenominal position in the same language proves that a head-final

approach is not necessarily the most economic one. Such an approach may provide a straightforward account for postnominal elements, but it requires additional (remnant) movements to derive their prenominal positions. It is possible to claim that a head-final structure is to be preferred for orders (as in LIS) which are the mirror sequence of what is observed in head-initial languages (e.g. English) because such a deep structure would derive directly the surface order of elements without any (remnant) movements. This claim, however, requires the paradoxical assumption that, when a single language (e.g. NGT) displays two distinct orders of elements, it has two different deep structures (in fact opposite ones, if we think of the Num-A-N vs. N-A-Num orders in NGT). Thus, once remnant movement is proven to be necessary anyway and the organization of the deep structure is shown to depart in any case from the order of overt elements at the surface structure, there is no longer a need to reject an antisymmetric Specifier-Head-Complement structure. This structure has the additional advantage of being shared also by head-initial languages, thus being a good candidate for a Language Universal. The fact that quantifiers and some higher adjectives, such as OTHER, precede the noun in NGT indicates that raisings in this language stop at some point in the DP, as proposed by Cinque (2000) for the word order of Romance languages, for instance. At the same time, the fact that in NGT, a prenominal demonstrative index (which can be pluralized) may co-occur with an (invariable) postnominal locative index matches Bruge's (2002) proposal for Spanish. According to this hypothesis, the demonstrative and the locative are merged together and are then possibly split up by leftward movements of Dem and N. In contrast, the fact that all indexes are postnominal in LIS makes it difficult to distinguish the locative from the demonstrative. Still, the co-occurrence of reduplicated indexes on the dominant hand with an invariable index on the nondominant hand is compatible with the claim that pied-pipings in LIS apply more consistently and extensively than in NGT (see chapter 2), thus stranding not only the locative but also the demonstrative index in postnominal position.

The order of elements related to the IP domain proves to be compatible, in principle, with an antisymmetric phrase structure and a sequence of successive leftward "rolling-up" pied-pipings. Crucially, an analysis in terms of Specifier-Head-Complement structure and leftward movements is able to relate the order of IP elements in LIS and NGT to

another property of these sign languages: the attachment site of the subject agreement marker. Synthetically inflected verbs (e.g. agreeing verbs) bear person inflection, even when they are accompanied by aspectual and modal signs, so that these uninflected, postverbal markers also follow subject agreement. Also, in head-initial spoken languages, uninflected elements (e.g. infinitives or participles), which are generally taken to be lower than subject agreement in the structure, follow subject agreement in the linear order (e.g. they follow finite auxiliaries). In other words, the antisymmetric account allows the assumption that subject agreement in LIS and NGT is structurally high (and on the left) as in head initial languages. It relates the different surface order of elements to the distinct elements bearing subject agreement. Conversely, assuming a head-final deep structure would make it necessary to assume that subject agreement in these two sign languages is lower than in head-initial languages, such as English or Italian and, crucially, even lower than in Turkish (by Baker's (1985) Mirror Principle), which is classified as head-final.

LIS shows in the IP again a more rigid ordering than NGT. In fact, LIS markers and affixes display the mirror order of the merge order **Mod>…Asp$_{perf}$>…Asp$_{dur/celer(fast)}$>…V** proposed by Cinque (1999, 2006) and appear consistently postverbally, whereas NGT modals can appear either pre- or postverbally. Aspectual markers, in contrast, occur postverbally in both languages or, at best, appear on the verb (if they are movement-altering affixes). Notice that modals are higher than aspect markers in Cinque's hierarchy and this matches the previous claim that pied-pipings apply more extensively and consistently in LIS than in NGT, as argued in the case of DP. In fact, because of this different extent of pied-piping, lower elements are more easily affected by inversion in both languages, while higher elements are affected only or more often in LIS. Crucially, adverbs which quantify over events, such as 'always' (= all the times/cases), are consistently postverbal in LIS, but occur before the verb in NGT, thus behaving similarly to nominal quantifiers, such as 'all', which are consistently postnominal in LIS, but occur before the noun in NGT. This suggests that NGT pied-pipings stop at a certain level within IP, just as they do within DP. It also entails that such adverbs are quite high within IP as (nominal) quantifiers are high within DP.

The final position of negative elements in the two sign languages is derived through raising or merger of the negative element into

[Spec;NegP] as in Geraci (2005). Negative elements of both languages raise to [Spec;NegP], except for LIS NOT, which is merged there. In contrast to Geraci, however, it is assumed that the specifier is on the left and that raising is leftward and followed by remnant movement past the negation. The in situ position of negative elements is explained as a consequence of the fact that the negative element raises leftwards together with a number of surrounding elements, as proved by the presence of the negative NMM over a string of signs (rather than just on one sign). Thus, here it is assumed that movement is always overt, if raising of the negative element occurs. However, the negative element may be extracted alone or raise as part of a bigger chunk, along the lines of what has been proposed for wh raising in interrogative clauses on the basis of Aboh & Pfau's (2011) analysis (see chapter 4 and here below for the discussion of CP). Finally, the negative "headshake" NMM is assigned under spec-head agreement in [Spec;NegP], as in Geraci and similarly to what has been proposed for other NMMs, for example, for interrogative NMMs in Pfau (2006a). Thus, in both languages, the extension of the negative NMM directly reflects the extension of the chunk moved to [Spec;NegP] containing the negative element. If an element is merged in [Spec;NegP], the NMM spreads only across that element.

When in NGT no overt negative particle appears, that is, in simple negative sentences, the raising of some constituents is forced in order to fill NegP, so that the NMM spreads over a string of signs, again under spec-head agreement. For instance, if the verb and (additionally) the object raise to [Spec;NegP], the NGT negative NMM will spread across verb and object. In LIS, in contrast, the lexical negation NOT is merged directly in [Spec;NegP], hence the NMM is restricted to that sign and remnant movement of the whole clause occurs, stranding NOT clause-finally. No clear conclusion can be reached about the exact position of NegP in the structure. However, if NegP sits above IP, as proposed by Geraci (2005), the remnant movement may target FinP, or, alternatively, if NegP is within IP, the remnant movement may target TP or some aspectual or modal projection. In both cases, projections are involved which are independently assumed for a number of other languages. The facts about LIS negation also show that the surface order of signs in this language is the mirror order of the underlying **Neg… > Mod… > V.** In

fact, it is possible to observe the order V-Mod-Neg with some LIS modals.

In the light of this discussion, LIS leftward movements raise the verb before the modal and the complex verb-modal before the negation. However, the data show that LIS and NGT usually convey modal negation by means of specific negative signs which encode both modality and negation in one lexical form. It has been argued that these forms are not just a combination of negation with a (positive) modal, in that their semantic content is partially different from that of their positive counterparts. Negativity is a byproduct of their semantics and this semantics is related to distinct forms which are inserted in the lexicon as independent signs. This phenomenon is attested also across spoken languages. In contrast, when the positive form of the modal is negated without any additional semantics, that is, when there is just a combination of modal and negation, the standard negative constructions are used: LIS adds the lexical negation NOT and NGT adds simply the negative NMM. The two sign languages, however, have partially different inventories of negative modal signs and this shows, again, that sign languages display more crosslinguistic variation than may be expected at first sight (see §6.1).

The CP domain of both languages presents some instances of leftward movement and Specifier-Head-Complement structure, as well as some cases of (apparent) rightward movement and head-final or specifier-final structure. Clear evidence of leftward movement are topicalized constituents, which appear in the left periphery of the sentence, and conditional subordinate clauses, which again occur to the left of the matrix clause and may also contain an optional lexical marker introducing the subordinate. Conditional lexical markers are clause-initial and support thus the view of a Spec-Head-Compl structure. Data also show that in LIS EHRCs the head noun occurs to the left of the relative clause, thus behaving like DGS relative constructions (see Branchini et al. 2007). Moreover, in LIS EHRCs, a sign PE (analyzed as a demonstrative) can occur at the beginning of the relative clause. In contrast, the clause-final position of wh elements in both LIS and NGT, along with the clause-final position of the NGT interrogative marker Q-PART appear to be instances of a head-final deep structure where righward movement occurs. Also, the clause-final position of the sign PE in IHRCs of LIS (analyzed here as circumnominal, based on Branchini & Donati's (2009)

view that they are internally-headed, but not correlative) supports this hypothesis. Indeed, LIS wh interrogative clauses and PE-clauses have long been treated as evidence of a head-final structure. However, Aboh & Pfau (2011) and Aboh, Pfau & Zeshan (2005) have shown that the sentence-final question marker Q-PART of NGT and the wh lexical marker G-WH of IPSL pattern similarly to sentence-final question markers and interrogative tonemes attested in some spoken languages (e.g. Oro Nao, Gungbe). They have provided an analysis of yes/no and wh interrogative clauses in terms of leftward movement which raises (part of) the clause across these particles stranding them clause-finally.

Following Aboh & Pfau's (2011) observation that wh phrases are independent from interrogative marking and my own observation (§4.1.3 and §4.2.3) that interrogative marking is also different from wh lexical or nonmanual marking, it is suggested that wh elements, interrogative markers, and wh or yes/no markers instantiate three distinct projections which can all be overtly filled at the same time in some Romance languages, generally considered to be head-initial and to have a Specifier-Head-Complement structure (Poletto & Pollock 2004). This is an extension to NGT of an idea originally proposed for LIS in Brunelli (2007, 2009). Data from these languages suggest that the hierarchy of these projections is **WhP > InterP > FocP**, where the higher WhP hosts disjunctive operators (Munaro & Pollock 2005), the second projection hosts interrogative markers or interrogatively-marked verbs, and FocP hosts wh phrases. The order of elements and the distribution of lexical and nonmanual markers of IPSL, LIS and NGT is derived by three successive leftward movements motivated by the need to check three distinct features. An intermediate projection, generally labelled TopP, is assumed to sit between InterP and FocP (along the lines of Aboh & Pfau (2011) and similar to Poletto & Pollock (2004)). The distribution and the function of the "raised eyebrows" NMM and "lowered/furrowed eyebrows" NMM also suggest that these encode Munaro & Pollock's (2005) disjunctive operator hosted in the highest wh projection. The "raised eyebrows" NMM signals finite disjunction, entailed in yes/no and alternate wh questions. The "lowered eyebrows" NMM signals infinite disjunction involved in the formation of open wh questions. The fact that wh signs, such as WHO or WHAT, may optionally occur in situ (that is, in first position if they are subjects and in preverbal position if they are objects) is accounted for following Aboh & Pfau's (2011) proposal that

such elements can either raise alone to FocP and be crossed by remnant movement or do not raise at all (or, alternatively, they raise as part of a bigger constituent).

Taking into consideration LIS complex wh phrases (e.g. WHICH BOOK) which can be split, the derivation of the distribution of elements is further refined with three distinct types of raising: wh element raising alone, raising together with a noun, or not raising at all (alternatively, raising with a yet bigger constituent). If the wh element raises alone and leaves the head in situ, the wh-phrase splits. If the wh and its noun raise together, the whole wh-phrase ends up in clause-final position. In all other situations, the whole wh-phrase occurs in situ.

As for the relative clauses, the vast majority of relative clauses of LIS and NGT are derivable under Cinque's (2003, 2008a) unified account, which assumes two head nouns and a CP structure with Spec-Head-Compl projections and three complementizers. Interestingly, the distribution of PE in LIS (at the beginning of EHRCs, final or in situ in IHRCs) can be treated along the lines of the distribution of wh elements, that is, with PE raising alone, raising with the internal head, or not raising at all (alternatively, raising with a yet bigger chunk). Some few cases remain unexplained, but may involve additional complexities, as, for instance, possibly bi-clausal structures or clitic subject indexes that occupy a different position than other subjects, thus distorting the order of elements.

In this light, Cinque's (2003, 2008) hierarchy of three CPs is reminiscent of the structure proposed in chapter 4 for interrogative (wh or polar) clauses. Throughout the analysis, yet another parallelism appears, that is, the LIS sign PE is independent from the restrictive relative marker, just as wh elements have been shown to be independent from lexical and nonmanual wh markers in interrogative clauses. This, far from being evidence for leftward movement, shows that an antisymmetric approach makes it necessary to take into consideration a finer syntactic structure of functional projections which ultimately must reflect a more subtle hierarchy of logical derivational steps. In this low-level sequence of operations, it is possible to highlight intriguing parallelisms between different constructions and syntactic domains of the language.

The similarities between relative constructions and interrogative constructions appear in the same syntactic domain (both phenomena have to do with the CP), while other parallelisms appear in distinct domains,

such as the similar orders of elements within DP and IP, for instance. Thus, assuming a more articulated structure for these two domains reveals that, in both of them, there are elements which are ordered hierarchically higher and which are less consistently affected by rolling-up pied-pipings, and lower elements which are more easily affected. In my opinion, from this point of view, antisymmetry is also a useful tool to delve into the essence of categories such as NP and VP, given that differences can be determined more easily once the similarities have been observed.

6.3 Motivating the projections

Apart from testing the compatibility of antisymmetry with the different sign orders of LIS anf NGT, it would also be attractive to find some independent evidence, or at least some clues, for the existence of projections that thus far have been imposed by purely theory-internal requirements. In fact, on the one hand, antisymmetry maintains that every single instance of (apparent) rightward movement results from at least two successive leftward movements associated with distinct projections. In other words, under antisymmetry, additional projections are necessary to explain (apparent) rightward movement. On the other hand, however, a proliferation of unmotivated projections must be avoided. Motivating independently the projections required by the leftward-movement analysis lends additional support to the analysis itself. As seen in §6.2 and chapters 4 and 5, a number of distinct projections within the CP domain of LIS and NGT is supported on the basis of analogy with the distribution of lexical elements in head-initial spoken languages. Support comes also from semantic aspects, given the fact that disjunction, interrogativity, definiteness, and identification of a head noun are independent factors which must co-operate in the formation of interrogative or relative clauses. Thus, for instance, Poletto & Pollock (2004) and Munaro & Pollock (2005) provide independent evidence for the existence of additional projections in interrogative clauses of head-initial spoken languages, while Aboh, Pfau & Zeshan (2005) and Aboh & Pfau (2011) reach similar conclusions on the basis of sign languages (see §6.2). Also, on the basis of the need to give prominence to the element to which interrogativity applies in polar and wh questions and to the element to which identification applies in relative constructions, it seems

reasonable to assume a FocP (or ContrP) inside the CP domain. In this respect, it is striking that all the cases of apparent rightward movement in the left periphery of LIS and NGT seem to reduce to instances of one phenomenon, namely focalization or contrast as argued in §5.2.3 and §5.3, a fact which, in my opinion, does not provide sufficient motivation for the assumption of a head-final structure for the whole CP domain. In conclusion, although the exact number and type of projections required for interrogative and relative clauses must still be determined, there are convincing clues that these projections can be independently motivated.

As for the IP domain, the main reason to assume a Specifier-Head-Complement structure with leftward movements is the position of agreement on the verb, especially subject agreement, which linearly precedes modals and aspectual markers, as it does in a number of other languages classified as head-initial. The argument is thus based on a crosslinguistic and cross-modal generalization, in that the leftward movement approach captures a parallelism between LIS and NGT, on the one hand, and head-initial spoken languages, on the other (although this parallelism concerns an abstract phenomenon, the position and the nature of subject agreement). In this light, the only difference between these languages lies in the element on which agreement inflection appears in LIS and NGT, that is, the lexical verb. Another argument of generalization supports the adoption of a Specifier-Head-Complement structure for IP. Assuming leftward movement to [Spec;XP] in the IP domain provides a uniform theory, adopting a mechanism parallel to the one proposed for the CP domain, which in turn shows similarities with theories proposed for spoken languages with Spec-Head-Compl structures. For instance, negative constructions are derived assuming that negative NMMs are assigned under spec-head agreement in a specifier within the IP domain, just as wh interrogative NMMs are assigned in a specifier within the CP domain and correspond to functional elements attested in languages with Spec-Head-Compl structure.

However, future research is necessary to find further evidence for leftward movement in IP, in order to further motivate these assumptions. Notice also, that in this dissertation I have neither discussed the position of the object in the structure nor the exact structural position of subject agreement, which is notoriously difficult to determine. The proposal made here is based only on the **relative position** of subject agreement with respect to aspectual and modal markers. In negation, the landing site

for remnant movement has not been determined, yet, but it can reasonably be a TP, AspP or FinP (§3.2.4), that is, projections generally assumed for a number of other languages for independent reasons.

Finally, in case of the DP domain, I have only been able to verify the compatibility of the sign order(s) of LIS and NGT with antisymmetry and pied-piping. In Cinque's view, the inverting pied-piping movements should target some agreement projections (AgrPs), but, as he himself points out, it does not make much sense to postulate projections specific for agreement (see §3.3 on verbal agreement; the same conclusions hold for agreement in general.). Agreement, in fact, is a general phenomenon induced by spec-head relation in a maximal projection, regardless of the type of projection. Consequently, it can occur everywhere within the syntactic structure. It is not itself a feature encoded in a specific projection. Actually, some instances of agreement between DP-internal elements are observed in LIS and NGT. For instance, in §2.1.3 a plural demonstrative has been shown to agree overtly with a plural-marked noun (for NGT, see also Vink (2004); for LIS, see Pizzuto & Corazza (1996) and Bertone (2007)). Bertone (2007) discusses also number agreement (and, to a lesser extent, gender agreement) between noun and adjective in LIS in relation to Cinque's AgrPs. She also describes some instances of location agreement between noun and adjective. However, I have not investigated whether the instances of agreement observed within the DPs of LIS and NGT can safely be taken as evidence for the existence of all the AgrPs hypothesized by Cinque. Nor have I investigated how they can be put in relation to the different extent of the leftward movements hypothesized in this dissertation. Future research will hopefully identify specific features associated with those DP-internal intermediate projections, which so far have remained unexplained. I have also not considered classifiers, which should be taken into account for a complete analysis, since they are widely used in sign languages. Moreover, I have not analyzed the relative order of different adjectives (Scott's (2002) hierarchy).

At the moment, there appears to be only one convincing reason for noun raising. Following Bertone (2007), it is possible to assume that raising to [Spec;DP] is motivated by the need to fill the projection which is responsble for referentiality (Longobardi 1994) and/or case (Giusti 2005), given that LIS and NGT do not have articles which spell out D°. Apart from this, one argument of generalization can be offered as a clue

in favour of an antisymmetric approach to the DP of LIS and NGT. This is the observation made above that a Specifier-Head-Complement structure of their DP could highlight interesting parallelisms between the distribution of DP elements and IP elements in both sign languages, together with the observation that a Specifier-Head-Complement structure for their IP domain in turn relates the position of their subject agreement to that of head-initial spoken languages. In addition to this, consider that the advantage of an antisymmetric model is also that it predicts the impossibility of some orders, such as, for instance, ***A-Num-N** or ***Loc-N-Dem**, which are in fact neither attested in LIS nor in NGT. Also the fact that in one and the same language, NGT, some elements can be either post- or prenominal and modals can be either post- or preverbal suggests that the postverbal and postnominal positions of elements may not automatically be related to a head-final structure and that some movement has to be assumed anyway. This last observation does not per se motivate (the projections required by) leftward movement and antisymmetry. Rather, it shows that, although the surface order of LIS and NGT signs is often the opposite of the order observed in head-initial spoken languages (and sign languages), this does not automatically imply that the LIS and NGT deep structure is head-final.

6.4 Some counterarguments to antisymmetry

As has often be stated (e.g. in §1.2.3 and §1.4), one of the aims of this dissertation was to investigate whether, in principle, the antisymmetric model with leftward remnant movement(s) is applicable to LIS and NGT and to show the possible advantages and consequences of applying this model. The previous section has discussed some open questions concerning the motivation of projections in an antisymmetric deep structure of LIS and NGT. This discussion leads to the conclusion that an antisymmetric account is plausible. However, a number of counterarguments to antisymmetry have been made by Cecchetto, Geraci & Zucchi (2009) with respect to LIS, although most of their arguments can also be applied to NGT. Here I shall address these counterarguments and take the opportunity to make some further speculations. The first counterargument problematizes the "massive application" of pied-piping in sign languages, the second is based on the spreading of wh NMMs across parts of distinct constituents, and the third deals with

contradictions arising in the analysis of sentences that combine negative quantifiers and wh elements.

According to Cecchetto et al. (2004b, 2009), under leftward remnant movement, it is not possible to account for wh NMM spreading across parts of different constituents in (271), because this sentence would be analyzed as (272). According to them, under leftward remnant movement, SAY and WHO, over which the wh NMM occurs, «do not form a constituent and there is no obvious way to group them» (Cecchetto et al. 2009:292).

271.   [LIS: Cecchetto et al. 2009:292]

<u>   wh. </u>
PAOLO ARRIVE AFTER SAY WHO
'Who said that Paolo arrived later on?'

272.   [LIS: Cecchetto et al. 2009:292]
[PAOLO ARRIVE AFTER t_{who} SAY]$_{REMNANT}$ [WHO $t_{remnant}$]

Brunelli (2007, 2009) noticed that the wh interrogative NMM in (271) spreads correctly over the direct question, that is, the interrogative matrix clause SAY WHO, leaving out the subordinate clause, which is not interrogative (see also §4.2.5). The interrogative clause is analyzed in the light of Poletto & Pollock's (2004) structure with two wh projections and drawing on Aboh, Pfau & Zeshan (2005), along lines similar to the present dissertation. The fact that the subordinate clause appears to the left of the interrogative matrix clause is probably related to independent properties of LIS, since subordinate clauses to the left of the matrix clause are observed also in affirmative sentences as shown by Cecchetto et al. (2009). For instance, the sentence (273.a) is an alternative realization of (273.b). Crucially, in (273.a), the subordinate [MARIA CAKE EAT] is positioned to the left of the matrix clause.

273.
    a.   MARIA CAKE EAT GIANNI SAY   [LIS: Cecchetto et al. 2009: 292]

    b.   GIANNI SAY MARIA CAKE EAT   [LIS: Cecchetto et al. 2009: 292]
        'Gianni said that Maria ate a cake'

However, Cecchetto et al's (2009) analysis, if I understand it correctly, does not account for this left position of the subordinate clauses (unless one assumes a split-CP, which sometimes branches leftwards and sometimes rightwards). Examples (273.a) and (273.b) are also related to the observation that, although LIS and NGT objects appear between verb and subject in SOV[113] order, subordinate complement clauses do not. This distribution may suggest that subordinate clauses are merged to the left of the verb of the matrix clause, just like objects, and must move to some position to its right, that is, to the end of the matrix clause. Cecchetto et al. (2009) do indeed derive (273.b) assuming that the subordinate clause moves rightwards. However, the order **matr.clause – sub.clause** (with non overt complementizer) is attested also in head-initial languages, for instance, English, hence it is not necessarily an argument against antisymmetry. Also, the position of LIS complementizers, such as REASON, which has developed into a functional sign acting like BECAUSE, reveals the same order **matr.clause – CP element – sub.clause** attested with causal subordinate clauses in head-initial languages (Brunelli 2009). This suggests that the mechanisms at work in LIS (and arguably NGT, given the clause-initial position of the complementizer OMDAT 'because') are likely to be the same as in languages with Specifier-Head-Complement structure. A similar phenomenon is attested in DGS, where the noun REASON «has developed into a complementizer introducing cause complements» (Pfau & Steinbach 2007:309). In LIS the sign fulfils also the function of WHY, much like its Italian counterpart *perché* ('why/because').

Turning back to subordinate clauses, these can thus be taken to be merged as objects to the right of the matrix verb in LIS, as it is assumed for their counterparts in head-initial languages. That is, (273.b) would reflect the postverbal merger of subordinate complement clauses in LIS. The same can also be assumed to occur in NGT . Clearly, if one takes this view, consistent with antisymmetry, the object NP must also be assumed to originate postverbally in these sign languages. In other words, the underlying order of these languages would be SVO and their surface order SOV is derived. It is not the subordinate clause that moves rightwards, then, but it is the object that undergoes some leftward movement, which must be motivated. As pointed out earlier in this

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[113] However, recall that also the SVO is observed (see chapter 3).

section, I am not discussing the position of subjects and objects in this dissertation, but I can tentatively suggest here that object NPs move leftwards for reasons related to case or agreement, much like subjects do. After all, in LIS and NGT, agreement between verb and object is available and used frequently, even though only a subset of verbs shows overt agreement. Subjects, which are able to agree with the verb, precede the verb in LIS and NGT as in Italian or English. Along similar lines, it can be argued that LIS and NGT objects, which are able to trigger agreement on the verb, also come to precede it[114]. Clauses, in contrast, do not agree with the verb and can thus remain in situ, that is, in postverbal position as shown in (273.b). However, if they move, they raise leftwards as in (273.a).

From this perspective, it is not necessary to assume that movement sometimes proceeds leftwards as in (273.a) and sometimes rightwards as in (273.b); movement, if it occurs, is always leftwards. Both nouns and subordinate clauses move then leftwards, but target distinct positions, as the data show. In particular, nominal objects come to be between subject and verb, while object complement clauses target a position before the subject. The derivations are similar, though not identical: **SOVt_o ≈ SubSVt_{sub}**. This difference may appear to be unmotivated. Yet, nouns and clauses probably target distinct projections because their movements are driven by distinct features. For instance, nouns may agree in case, number or ϕ-features, whereas clauses are CPs and may thus have some "CP features" to check. The fact that distinct features are involved in the two processes also accounts for the different types of movement observed: while there is a strong tendency in LIS and NGT to move the object NP to a position preceding the verb, the movement of an object CP seems to apply less frequently or, that is, it appears less obligatory.

A further counterargument brought forward by Cecchetto et al. (2009) is that under a remnant movement analysis, combining interrogativity and negation (e.g. constructing a question with a negative quantifier) implies the extraction of the wh or negative element from a specifier island and requires two unspecified projections «whose only purpose is to get the word order right» (2009:317). In other words, this counterargument questions the functioning of antisymmetry across the IP and the CP

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[114] This raises some questions about the fact that other sign language, like e.g. ASL, have agreement, but SVO order.

domain. It also relies on the claim that some projections are not motivated. In considering the use of antisymmetry, this dissertation discusses distinct domains of LIS and NGT structure separately, so that the problems arising from the combination of different domains must be analyzed in future research. Moreover, even though I have usually assumed an SOV order at a certain point in the derivation (that is, in FinP/IP) for the partial derivations proposed, a thorough analysis of the whole derivation of the sign order of these languages can neither abstract away from the exact structural positions of subjects and objects (which I have not discussed) nor from the exact location of NegP (which I have left for debate). For instance, if NegP were within IP, lower than the position of the subject, the remnant movements which strand the negative element(s) clause-finally would not involve the raising of the subject. This would then be available for wh extraction. Apart from this, Cecchetto et al.'s (2009:317) discussion of remnant movement relies on the assumption that the OV order is already present at the very bottom of the structure, that is, within VP: [$_{NEG}$ [$_{IP}$ WHO [$_{VP}$ [NOTHING SIGN]]]]. In other words, the analysis attempts to challenge the applicability of leftward movement(s) starting from a head-final structure.

It is relevant here to note that Neidle et al. (2000:147) also refute an antisymmetric account of ASL wh questions because it requires two unexplained projections: deriving ASL wh interrogative clauses from an antisymmetric structure «requires postulating additional functional projections and movements that are apparently otherwise unmotivated», while «projections are postulated only if motivated» (Neidle et al. 2000:147). The issue of motivating the projection was discussed fully in §6.2 and §6.3 (as well as chapter 4, which is concerned with wh questions). It is also relevant that the leftward movements necessary for wh interrogative inversion in LIS and NGT involve not more projections, but rather fewer, than those posited by Poletto & Pollock (2004) and Munaro & Pollock (2005) on the basis of evidence from spoken languages. The leftward movement required for negative inversion may target FinP (if NegP is above IP as in Geraci (2005)) or TP/AspP (if NegP is lower). In both cases, the assumed landing sites are projections generally assumed for a number of other languages for independent reasons.

At this point, though leaving much work for future investigation, we can turn to another argument from Cecchetto et al. When assuming that

right-peripheral positions of elements result from leftward (remnant) movements, a reason must indeed be provided for why remnant movement should apply so massively in sign languages, when compared to spoken languages. In light of what has been said in previous chapters, the massive use of "rolling-up" pied-piping is related to the following properties of LIS and NGT:

A. At least the raising of some material to [Spec;DP] is possibly related to the absence of articles that realize the DP projection lexically;
B. Movement to WhP is related to the presence of NMM, occasionally accompanied by lexical material in some languages;
C. The movement of the object may depend on agreement (spatial affix that can be incorporated into the verb and noun);
D. The order of verb, aspectual and modal markers within IP appears to be related to a different distribution of inflectional morphemes (subject agreement spatial affixes), in turn related to a reduced use of auxiliaries (such as 'have' and 'be').

Taken together, these facts suggest that the higher frequency of pied-pipings in LIS and NGT may be related to an increased lack of functional signs, in comparison to spoken languages. This absence of functional signs is balanced by leftward movement of other lexical material. In fact, it is no new observation that sign languages often lack overt articles and prepositions, substitute case and/or prepositional marking of complements by object-verb agreement, and often realize adverbs by means of NMMs. In this light, claiming an antisymmetric structure for LIS and NGT does not amount to denying their specific features related to the visual modality, but simply implies that the specificities of the visual modality affect a part of the grammar different from the branching organization of the deep structure. Instead of assuming that specific properties of the visual-modality reflect or imply a deep structure different from that of (head-initial) spoken languages, it is possible to claim that the specificity of the visual modality induces a different use of the same structure (which is universal). This difference could be related to reasons of economy and might have to do with the fact that both sign languages and spoken languages are part of this world, where laws of space-time apply. The fact that sign languages use space-time in a

different way than spoken languages do would make that economy yields different outcomes in the two modalities.

Both sign languages and spoken languages place their elements in linear order, for instance, arranging morphemes along the temporal dimension (e.g. the LIS/NGT perfective marker DONE follows the verb). However, the fact that sign languages can also exploit spatial resources means that they can also rely on devices that are independent from the time axis and thus have no effect on temporal ordering. These elements being time-independent, their affixation to a sign does not require time in the sense that it does not take additional time to pronunce them, that is, it does not necessarily lengthen the duration of the sign or the sentence. The availability of time-independent elements allows for the simultaneous encoding of different pieces of grammatical information. For instance, the referential system of many sign languages is based on spatial coordinates. Thus, it conveys important features on the spatial axes, that is, simultaneously to the root of the sign, without affecting the time axis. These referential features play an important role in verb-subject agreement and verb-object agreement, so that the spatial affixes ultimately surrogate the functions of different case-endings and prepositions. The same features are also used in pronominalization and for agreement between some nouns and adjectives, which in spoken languages may rely on gender or class suffixes. These spatial affixes are then **full** affixes with regard to functional content, but **null** affixes with regard to the time load. Thus, their use is more economic than adding a functional item, as small as it may be. Nonmanual markers, too, are time-independent because they are suprasegmental and can be superimposed onto strings of signs.

Spoken languages, in contrast, though making use of vocal intonation, apparently do not have at their disposal a comparable number of time-independent functional elements. Therefore, they must resort to lexical functional elements which extend only on the temporal dimension and may be affected by a number of prosodic phenomena (which I do not discuss here) and phonological reduction. In fact, the size of these elements corresponds to their temporal length. For instance, these elements cannot be short (as for the time to pronunce them), but "large" (in some other aspect). When phonological reduction applies, the time required to spell out a lexical element is reduced. This implies that reducing the (only) dimension of these elements voids (or, at best,

weakens) also their only source of grammatical information because there is less material left to spell out their grammatical contribution. Relying only on the time axis, spoken languages must constantly balance between time-consuming elements which express the relevant information and zero elements, which carry no information. Spoken languages are thus in continuous need of lexical functional material, while sign languages are driven by economy principles pushing them toward a broader use of nonlexical functional elements which, as argued above, is in turn related to the movement and pied-piping of some other material in order to spell out the features of the relevant functional projections.

6.5 General conclusions

Apart from some general observations about antisymmetry and the visual modality presented in chapter 1 and in §6.4, the ordering of DP elements, IP elements, and CP elements shows a considerable crosslinguistic variation, but is largely compatible with observations made for spoken languages. It also seems compatible on the whole with an antisymmetric model. In conclusion, the leftward movements hypothesized in CP are supported by the need to encode specific features, which also exist in other languages; the movements invoked for IP are supported above all by theoretical, crosslinguistic and crossmodal generalizations (the position of subject agreement in the surface and deep structure of LIS and NGT is the same as in head-initial languages) and by distributional properties of LIS and NGT lexical and nonmanual markers; the discussion about DP deals simply with the possibility of deriving the sign orders of these languages "mechanically" from an antisymmetric structure, without providing much independent evidence for the factors triggering these movements. When discussing the DP, I have also left out the classifiers, which are widely used in sign languages, and I have not investigated the possibility of a hierarchical relative order of adjectives (Scott 2002). In the discussion of the IP, I have left open the question of the exact nature of verbal movements (all XP movements as in Cinque or also some head-movements?). It is also necessary to verify whether available alternative orders of some LIS and NGT signs within DP and IP are indeed fully equivalent or whether they are possibly motivated by subtle interpretive differences that have not yet been discovered. Alternatively, the preference for a certain order might also depend on the

local variety of the language. This also illustrates the need to collect data from a larger group of informants, both in the case of LIS and in that of NGT. Despite these facts, the plausibility of an antisymmetric deep structure underlying LIS and NGT has been demonstrated, in my opinion, at least when phenomena within a single domain are considered. It is worth undertaking a more detailed antisymmetric analysis of these languages, especially focusing on phenomena occurring across distinct domains. However, as mentioned in chapter 1, I think that in order to delve into all the open questions concerning these languages and to verify whether antisymmetry is really able to account for all of their properties, it is desirable to involve LIS and NGT native-signer researchers who are able to recognize the subtleties of their own sign languages directly.

Summary

This aim of this dissertation is to provide a first (partial) account for a wide range of syntactic constructions in Italian Sign Language (LIS) and Sign Language of the Netherlands (NGT) within an antisymmetric framework. On the one hand, it tries to evaluate the attested crosslinguistic variation between these two languages; on the other hand, it assesses whether the observed differences can be derived from a strict specifier-head-complement deep structure where only leftward movement occurs.

Chapter 1 provides some theoretical and descriptive background for the following chapters, including the theoretical framework that forms the basis for analysis. It also illustrates the conventional notations used throughout the dissertation and the methodology employed. In particular, the data stem from different sources. Some examples were collected from the literature, others were elicited from informants and/or subjected to their grammaticality judgements.

Chapter 2 compares the DP domain of LIS and NGT. It takes into account a wide range of elements that may accompany the noun: adjectives, numerals, demonstratives, possessives, and quantifiers. The results provide evidence for cross linguistic variation. In LIS, these elements are postnominal, whereas in NGT, according to the data available, some of these elements are prenominal.

The linear orders of both LIS and NGT appear to be compatible with accounts based on antisymmetry. I demonstrate that in both languages, the surface order of the elements analyzed can be derived by means of successive leftward movements within one universal hierarchy of projections. The cross-linguistic variation, that is, the different linear orders observed, results from the different extent of leftward raising in the two languages. At present, the necessity of leftward movement, in both languages, seems to be motivated only in a general way by the lack of functional elements (e.g. articles) in the higher part of their DP. However, further research is necessary to offer independent motivation for all the derivational steps proposed in the analysis.

Chapter 3 deals with the IP domain of LIS and NGT. Again, the order of elements considered – some selected aspectual markers, modals, and negative elements – show interesting crosslinguistic variation. In LIS, these elements are postverbal, whereas NGT, modals occur also

preverbally. Moreover, in LIS, the lexical negator NOT is obligatory, whereas in NGT, the negative non-manual marker (NMM), a headshake, is sufficient to negate a proposition. The orders of signs analyzed are compatible with antisymmetry: they can be derived from one universal hierarchy of projections via leftward movement. The analysis proposed also accounts for the distribution of negative NMMs. The different extent of leftward raising is reflected by differences in the surface order of signs and the scope of the NMMs.

According to the data, LIS and NGT employ specific negative modal signs except when conveying the meaning of "non-obligation". In this case, each language resorts to its standard negative construction. The analysis is based on the semantics of the modal signs and proposes that the differences observed depend on the scope relation between modals and negation within a universal deep structure.

The landing sites of the derivational movements proposed are not always exactly determined. However, it is hypothesized that the leftward movements of the derivation target projections already independently motivated for other languages.

The antisymmetric account is supported by the fact that it plays a crucial role in relating the linear order of elements and the position of subject agreement on LIS and NGT agreeing verbs, without requiring additional stipulations, as compared to head-initial spoken languages as, for instance, Italian and French.

Chapter 4 addresses the CP domain, by comparing imperative and interrogative clauses of LIS with their NGT counterparts. It also addresses the interplay between these constructions and topicalization in both sign languages.

The data show a considerable degree of cross- and intralinguistic variation, but are still compatible with antisymmetry. In particular, when it comes to the distribution of wh signs in both sign languages, it is observed that constructions with clause-final wh elements and doubled wh elements (co-)occur also in some Romance spoken languages. The clause-final position of functional signs and the scope of NMMs in imperative clauses, polar interrogative clauses, and wh interrogative clauses are accounted for along the lines of antisymmetric accounts previously put forward both for sign languages and spoken languages.

It is proposed that the different leftward movements involved in the derivation are driven by the need to check features necessary to all

languages: (i) focalization of the questioned element, (ii) interrogative marking, and (iii) marking of the type of interrogativity (which may depend on the presence of an open or closed set of answers to the interrogative clause). Different topic projections are claimed to be present in the left-periphery of the clause and it is suggested that not all of these topic projection may be associated with a "raised eyebrows" intonation, along the lines of proposals put forward for topic intonation in Italian.

Chapter 5, addresses combinations of CPs, that is, combinations of clauses, in LIS and NGT. Specifically, it deals with conditionals and with restrictive relative clauses.

However, while data suggest that a variety of internally-headed and externally-headed relative clauses exist in LIS, there is, at present, no clear evidence that NGT has a dedicated relative clause construction (although informal observation suggests that such constructions might exist). The chapter thus offers an account for conditional clauses of both LIS and NGT, while for relative clauses, an account is only put forward for LIS. The derivation proposed benefits also from a comparison with other sign and spoken languages.

The antisymmetric framework is compatible with the data about conditionals and with most LIS relative clauses. As for conditionals, an antisymmetric account is motivated in the two sign languages by the left-peripheral position of the conditional subordinate clause with respect to the matrix clause as well as by the clause-initial position of the optional lexical markers within the conditional subordinate clause. The presence, at least in NGT, of topics embedded within the conditional subordinate clause further supports this account. An antisymmetric approach to LIS relative clauses is supported on basis of the fact that these clauses show a considerable intralinguistic variation that patterns with the variety attested in LIS interrogative constructions, which are in turn similar to interrogative clauses of specifier-head-complement structured spoken languages (as argued in chapter 4).

The fact that LIS, in addition to internally-headed relative clauses, has postnominal externally-headed relative clauses, which have a linear order analogous to the order observed in specifier-head-complement spoken languages, also suggests that an antisymmetric account for LIS should be taken into consideration. In particular, with antisymmetry, it is possible to account for the LIS intralinguistic variation (internally-headed and externally-headed relative clauses) with a specifier-head-complement

deep structure responsible also for postnominal externally-headed relative clauses of spoken languages.

Finally, the chapter offers some support for the hypothesis that conditional clauses are in fact a sub-type of relative clauses. This proposal is based on the observation that LIS conditional and restrictive relative NMMs are similar and that lexical conditional markers of LIS and NGT share some properties with a functional element that also occurs in LIS relative clauses,.

Chapter 6 puts the conclusions of the previous chapters in a broader perspective, highlighting some interesting parallelisms observed in the accounts of different LIS and NGT constructions.

After addressing briefly some potential counterarguments to antisymmetry, which have previously been put forward for LIS, the chapter presents an overview of the results and sketches promising avenues for further research. The general conclusion of this feasibility study is that a comparative antisymmetric analysis of LIS and NGT (and other sign languages) is certainly an exciting and worthwile undertaking, although further research must still cover further aspects of these languages to yield a more complete picture of their structural organization and the attested inter- and intra-modal variation.

Samenvatting

Het doel van dit proefschrift is een eerste (gedeeltelijke) uiteenzetting te geven van meerdere syntactische constructies in Italiaanse Gebarentaal (LIS) en Nederlandse Gebarentaal (NGT) binnen een antisymmetrisch kader. Aan de ene kant probeert het de bewezen crosslinguïstische variatie tussen deze twee talen te evalueren; aan de andere kant bepaalt het of de geobserveerde veranderingen afgeleid kunnen worden uit een strikte specifier-hoofd-complement diepe structuur, waarbij alleen verplaatsing naar links plaatsvindt.

Hoofdstuk 1 levert een theoretische en beschrijvende achtergrond voor de volgende hoofdstukken, inclusief het theoretisch kader dat de basis voor de analyse vormt. Hier worden ook de notatieconventies toegelicht die door het gehele proefschrift worden gebruikt, alsook de toegepaste methodologie. De data zijn afkomstig uit verschillende bronnen; sommige voorbeelden werden verzameld uit de literatuur, andere werden ontlokt aan informanten en/of aan hun grammaticale oordeel onderworpen.

Hoofdstuk 2 vergelijkt het DP-domein van LIS en NGT. De vele elementen die het naamwoord kunnen begeleiden worden besproken: adjectieven, telwoorden, demonstratieven, possessieven en kwantificeerders. Het resulteert in bewijs voor crosslinguïstische variatie. In LIS zijn deze elementen postnominaal, terwijl volgens de beschikbare data sommige van deze elementen in NGT prenominaal zijn.

De lineaire volgordes van zowel LIS als NGT lijken compatibel te zijn met op antisymmetrie gebaseerde beschrijvingen. Ik toon aan dat in beide talen de oppervlaktevolgorde van de geanalyseerde elementen kan worden afgeleid door successieve verplaatsingen naar links binnen één universele projectiehiërarchie. De crosslinguïstische variatie, d.w.z. de verschillende geobserveerde lineaire volgordes, is het resultaat van het verschillende bereik van raising naar links in de twee talen. Voor het ogenblik lijkt de noodzaak van verplaatsing naar links in beide talen enkel te worden gemotiveerd door het gebrek aan functionele elementen (bijv. voorzetsels) in het hogere deel van hun DP. Verder onderzoek is echter nodig om onafhankelijke motivatie te bieden voor alle derivationele stappen die de analyse voorstelt.

Hoofdstuk 3 gaat over het IP-domein van LIS en NGT. Ook hier toont de volgorde van elementen – een aantal aspectuele markeerders, modale

en ontkennende elementen – interessante crosslinguïstische variatie. In LIS zijn deze elementen postverbaal, terwijl in NGT modale elementen ook preverbaal kunnen voorkomen. Bovendien is de lexicale ontkenning NOT in LIS verplicht, terwijl in NGT de ontkennende non-manuele markeerder (NMM), het hoofdschudden, voldoende is om een propositie te ontkennen. De gebarenvolgordes onder analyse zijn compatibel met antisymmetrie: ze kunnen worden afgeleid uit één universele hiërarchie via verplaatsing naar links. De voorgestelde analyse geeft ook een verklaring voor de distributie van ontkennende NMMs, aangezien de verschillen in gebarenvolgorde en de scope van de NMMs af zijn te leiden uit het verschillende bereik van de verplaatsing naar links.

Volgens de data gebruiken LIS en NGT specifieke ontkennende modale gebaren, behalve wanneer de betekenis van "non-verplichting" wordt uitgedrukt. In dit geval maken beide talen gebruik van de standaard ontkennende constructie. De analyse is gebaseerd op de semantiek van de modale gebaren en er wordt voorgesteld dat de waargenomen verschillen afhangen van de scope-relatie tussen modalen en ontkenning binnen een universele diepe structuur.

De landing sites van de voorgestelde derivationele verplaatsingen zijn niet altijd exact gedetermineerd. Er wordt echter gesteld dat de verplaatsingen naar links van de doelprojecties al onafhankelijk vastgelegd zijn voor andere talen.

De antisymmetrische verklaring wordt ondersteund door het feit dat deze een cruciale rol speelt in het relateren van de lineaire elementenvolgorde en de positie van subjectcongruentie op congruerende werkwoorden in LIS en NGT, zonder dat bijkomende bepalingen worden vereist, zoals in hoofdinitiale gesproken talen als bijvoorbeeld Italiaans en Frans.

Hoofdstuk 4 behandelt het CP-domein door imperatieve en interrogatieve zinnen in LIS en NGT te vergelijken. Het stelt tevens de interactie tussen deze constructies en topicalisatie in beide gebarentalen aan de orde.

De data tonen een aanzienlijke mate van cross- en intralinguïstische variatie, maar zijn niettemin compatibel met antisymmetrie. Met betrekking tot de distributie van wh-gebaren in beide gebarentalen is te zien dat constructies met zinsfinale wh-elementen en dubbele wh-elementen ook (gelijktijdig) voorkomen in sommige Romaanse talen. De zinsfinale positie van functionele gebaren en de scope van NMMs in

imperatieve zinnen, polaire vraagzinnen en wh-vraagzinnen worden uitgelegd op basis van antisymmetrische verklaringen, die eerder uiteengezet zijn voor zowel gebarentalen als voor gesproken talen.

Er wordt voorgesteld dat de verschillende verplaatsingen naar links, die betrokken zijn bij derivatie, worden aangestuurd door de behoefte om kenmerken te verifiëren die noodzakelijk zijn voor alle talen: (i) concentratie op het bevraagde element, (ii) vraagmarkering, en (iii) markering van het type vraagzin (hetgeen af kan hangen van de aanwezigheid van een open of gesloten verzameling antwoorden op de vraagzin). De claim wordt gemaakt dat verschillende topicprojecties aanwezig zijn in de linkerperiferie van de zin, en er wordt voorgesteld dat niet alle topicprojecties geassocieerd kunnen worden met een "opgetrokken wenkbrauw"-intonatie, zoals het stramien dat is voorgesteld voor topic-intonatie in het Italiaans.

In hoofdstuk 5 worden combinaties van CPs in LIS en NGT besproken, d.w.z. combinaties van zinnen. In het bijzonder wordt gekeken naar conditionele en restrictieve relatieve zinnen.

Hoewel de data suggereren dat er een verscheidenheid aan relatieve zinnen met intern én extern hoofd is in LIS, is er tot op heden geen duidelijk bewijs dat NGT een specifieke zinsconstructie heeft voor relatieve zinnen (hoewel informele observatie suggereert dat zulke constructies lijken te bestaan). Het hoofdstuk biedt dus een beschrijving van conditionele zinnen in zowel LIS als NGT, terwijl voor relatieve zinnen enkel een verklaring wordt gegeven voor LIS. De voorgestelde derivatie haalt ook voordeel uit de vergelijking met andere gebarentalen en gesproken talen.

Het antisymmetrische framework is verenigbaar met de data over conditionele zinnen, alsook met de meeste relatieve zinnen van LIS. Wat betreft conditionelen wordt een antisymmetrische verklaring in de twee gebarentalen gemotiveerd door de links-perifere positie van de conditionele bijzin in relatie tot de hoofdzin, alsook door de zinsinitiële positie van de optionele lexicale markeerders binnen de conditionele bijzin. In NGT wordt deze uitleg ondersteund door de aanwezigheid van topics die zijn ingebed in de conditionele bijzin. Een antisymmetrische benadering van relatieve zinnen in LIS wordt gestaafd door het feit dat deze zinnen aanzienlijke intralinguïstische variatie laten zien, die overeenkomt met de variëteit die is aangetoond voor interrogatieve constructies in LIS, die weer gelijk is aan vraagzinnen van specifier-

hoofd-complement gestructureerde gesproken talen (zoals beargumenteerd wordt in hoofdstuk 4).

Het feit dat LIS, naast relatieve zinnen met een intern hoofd, postnominale relatieve zinnen met extern hoofd heeft, die een lineaire volgorde hebben gelijk aan de volgorde die is gevonden voor specifier-hoofd-complement gesproken talen, suggereert ook dat een antisymmetrische verklaring voor LIS in aanmerking genomen moet worden. Met antisymmetrie is het mogelijk deze intralinguïstische variatie in LIS te verklaren met een specifier-hoofd-complement diepe structuur, die ook verantwoordelijk is voor postnominale relatieve zinnen met extern hoofd van gesproken talen.

Tot slot biedt dit hoofdstuk steun voor de hypothese dat conditionele zinnen in feite een subtype van relatieve zinnen zijn. Dit voorstel is gebaseerd op de observatie dat conditionele en beperkte relatieve NMMs in LIS hetzelfde zijn, en dat lexicale conditionele markeerders in LIS en NGT enkele eigenschappen delen met een functioneel element dat ook voorkomt in relatieve zinnen in LIS.

Hoofdstuk 6 plaatst de conclusies van de voorgaande hoofdstukken in een breder perspectief, en stipt enkele interessante parallellen aan die waargenomen zijn in de beschrijvingen van verschillende constructies in LIS en NGT.

Na het kort bespreken van enkele argumenten tegen antisymmetrie die eerder zijn voorgesteld voor LIS, presenteert het hoofdstuk een overzicht van de resultaten van dit proefschrift en worden mogelijk interessante richtingen voor verder onderzoek geopperd. De algehele conclusie van deze haalbaarheidsstudie is dat een vergelijkende antisymmetrische analyse van LIS en NGT (en andere gebarentalen) beslist een prikkelende en waardevolle onderneming is, hoewel verder onderzoek meerdere aspecten van deze talen zou moeten beslaan om een completer beeld te kunnen vormen van hun structurele organisatie en de bewezen inter- en intramodale variatie.

Riassunto

Lo scopo di questo lavoro è fornire una prima (parziale) analisi per una vasta gamma di costruzioni sintattiche della Lingua dei Segni Italiana (LIS) e della Lingua dei Segni dei Paesi Bassi (NGT). Questo lavoro, da un lato cerca fare una stima della variazione crosslinguistica esistente fra queste due lingue, dall'altro lato intende verificare se le differenze osservate possono essere derivate a partire da un'unica struttura profonda rigidamente specificatore-testa-complemento, nella quale avvengono solo movimenti verso sinistra.

Il capitolo 1 fornisce alcune basi teoriche e descrittive per i capitoli seguenti, incluso il quadro teorico su cui si basa l'analisi. Inoltre, illustra le convenzioni grafiche usate in questa dissertazione e la metodologia impiegata. In particolare, i dati provengono da fonti diverse. Alcuni esempi sono tratti dalla letteratura su queste due lingue, mentre altre frasei sono state elicitate dagli informanti e/o sottoposte al loro giudizio di grammaticalità.

Il capitolo 2 confronta i domini DP di LIS e NGT, prendendo in considerazione un'ampia gamma di elementi che possono accompagnare il nome: aggettivi, numerali, dimostrativi, possessivi, quantificatori. I risultati provano che esiste variazione crosslinguistica: in LIS questi elementi sono postnominali, mentre, secondo i dati disponibili, in NGT alcuni di essi sono prenominali.

Gli ordini lineari di LIS e NGT appaiono entrambi compatibili con derivazioni basate sull'antisimmetria. Come dimostro, l'ordine degli elementi di entrambe le lingue può essere derivato tramite una serie di movimenti a sinistra all'interno di una gerarchia di proiezioni universale. La variazione crosslinguistica, vale a dire i diversi ordini lineari osservati, è il risultato del fatto che il movimento a sinistra ha un'estensione diversa in ciascuna nelle due lingue. Attualmente la necessità di movimento a sinistra nelle due lingue sembra essere motivata solo in modo generale dalla mancanza di elementi funzionali (p.es. articoli) nella parte alta del loro DP. Per dare una motivazione indipendent a tutti i passaggi derivativi proposti sono necessarie ulteriori ricerche.

Il capitolo 3 tratta del dominio IP di LIS e NGT. L'ordine degli elementi considerati – alcuni marcatori aspettuali, modali ed elementi negativi – mostra nuovamente un'interessante variazione crosslinguistica. In LIS questi elementi sono postverbali, mentre i modali della NGT sono

anche preverbali. Inoltre, in LIS la negazione manuale NOT è obbligatoria, mentre in NGT è sufficiente un marcatore non manuale (MNM oppure, in inglese, NMM) per negare una proposizione. Gli ordini dei segni analizzati sono compatibili con l'antisimmetria: possono essere derivati da una gerarchia di proiezioni universale tramite dei movimenti a sinistra. L'analisi proposta spiega anche la distribuzione dei MNM negativi. La diversa portata del movimento a sinistra si riflette nei diversi ordini di segni e nell'estensione dei MNM.

In base a quanto emerge dai dati, LIS e NGT utilizzano segni modali negativi specifici tranne quando esse esprimono il concetto di "non-obbligo". In tal caso, ciascuna lingua ricorre alla propria construzione negativa canonica. L'analisi si basa sulla semantica dei segni modali e propone che le differenze osservate dipendano da relazioni di portata (scope) fra i modali e la negazione all'interno di una struttura profonda universale.

Le proiezioni di arrivo dei movimenti derivativi proposti non sono sempre determinate in modo esatto. Tuttavia, si ipotizza che i movimenti a sinistra raggiungano proiezioni già proposte indipendentemente per altre lingue.

L'approccio antisimmetrico è supportato dal fatto che esso gioca un ruolo cruciale in quanto mette in relazione l'ordine lineare degli elementi con la posizione dell'accordo di soggetto sui verbi ad accordo di LIS e NGT, senza richiedere assunzioni aggiuntive rispetto a lingue parlate quali l'italiano o il francese

Il capitolo 4 riguarda il dominio CP, dato che confronta le frasi imperative e interrogative della LIS con le loro equivalenti in NGT. Inoltre, si occupa dell'interrelazione fra queste construzioni e la topicalizzazione nelle due lingue.

I dati mostrano un grado notevole di variazione cross- e intralinguistica, ma sono comunque compatibili con l'antisimmetria. In particolare, per quanto concerne la distribuzione di segni wh di entrambe le lingue, viene osservato che elementi wh in fine di frase ed elementi wh raddoppiati (co)occorrono anche in alcune lingue romanze. La posizione finale dei segni funzionali e l'estensione dei MNM nelle frase imperative, interrogative polari e interrogative wh è spiegata in modo analogo ad analisi già proposte per lingue dei segni e lingue parlate

Si propone che i vari movimenti a sinistra che fanno parte della derivazione siano dovuti alla necessità di controllare dei tratti necessari a

tutte le lingue: i) focalizzazione dell'elemento su cui verte la domanda; ii) marcatura interrogativa e iii) marcatura del tipo di interrogatività (che potrebbe dipendere dalla presenza di un insieme chiuso o aperto di risposte per la frase interrogativa). Si propone che nella periferia sinistra della frase vi siano diverse proiezioni di topic, suggerendo che non tutte queste proiezioni sono associate con la marcatura "sopracciglia rialzate", in modo analogo a quanto è stato proposto per l'intonazione di topic in Italiano.

Il capitolo 5 tratta di combinazioni di CP, cioè combinazioni di frasi, in LIS e NGT. Più precisamente, esso tratta di frasi ipotetiche (o condizionali) e di frasi relative.

Tuttavia, mentre i dati suggeriscono che in LIS ci sia una varietà di frasi relative a testa interna e a testa esterna, al momento non c'è una prova chiara del fatto che la NGT abbia delle costruzioni specifiche per le frasi relative (benché alcune osservazioni informali suggeriscano che esse potrebbero esistere). Di conseguenza, il capitolo propone un'analisi delle frasi condizionali di LIS e NGT, mentre, per le frasi relative, propone un'analisi solo per la LIS. La derivazione proposta beneficia anche di un confronto con altre lingue, sia parlate che dei segni.

L'approccio antisimmetrico è compatibile con i dati sui condizionali di entrambe le lingue con la maggior parte delle frasi relative LIS. Per quanto riguarda i condizionali, l'approccio antisimmetrico è motivato nelle due lingue dalla posizione periferica sinistra della subordinata condizionale rispetto alla frase principale e dalla posizione dei marcatori lessicali opzionali, in inizio di frase all'interno della subordinata condizionale. La presenza, almeno in NGT, di topic interni alla frase condizionale subordinata supporta ulteriormente questo approccio. Un analisi antisimmetrica per le frasi relative LIS è supportata dal fatto che queste frasi mostrano una considerevole variazione intralinguistica, parallela alla variazione osservata nelle interrogative LIS, le quali a loro volta sono simili alle frasi interrogative osservate in lingue parlate con struttura specificatore-testa-complemento (come proposto nel capitolo 4).

Il fatto che la LIS, oltre a frasi relative a testa interna, abbia anche frasi relative postnominali a testa esterna, che hanno un ordine simile a quello osservato in lingue parlate di tipo specificatore-testa-complemento, suggerisce nuovamente che un'analisi antisimmetrica della LIS dovrebbe essere presa in considerazione. In particolare, nell'ambito dell'antisimmetria, è possibile spiegare la variazione intralinguistica della

LIS (relative a testa interna e relative a testa esterna) con una struttura profonda specificatore-testa-complemento che è anche responsabile delle relative postnominali a testa esterna delle lingue parlate.

In fine, il capitolo dà supporto all'ipotesi che le frasi ipotetiche siano in effetti un sottotipo di frasi relative. Questa proposta si basa sull'osservazione che in LIS il MNM condizionale e quello restrittivo relativo sono simili e sull'osservazione che i marcatori condizionali lessicali di LIS e NGT condividono alcune proprietà con un elemento funzionale che appare anche nelle frasi relative della LIS.

Il capitolo 6 dà una prospettiva più ampia alle conclusioni dei capitoli precedenti, sottolineando alcuni parallelismi interessanti osservati nella derivazioni di diverse costruzioni LIS e NGT.

Dopo aver discusso breemente alcune potenziali controargomentazioni all'antisimmetria che sono state precedentemente proposte per la LIS, il capitolo presenta una panoramica dei risultati e traccia alcune strade promettenti per la ricerca futura. Le conclusioni generali di questo studio di fattibilità sono che un'analisi comparativa antisimmetrica di LIS e NGT (e altre lingue dei segni) è un'impresa interessante che vale la pena di essere portata avanti, benché servano ulteriori ricerche per coprire tutti gli aspetti di queste lingue e dare un'immagine più completa sia della loro organizzazione strutturale che della variazione inter- e intra-linguistica.

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