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**Antisymmetry and sign languages: a comparison between NGT and LIS**

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## 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<sup>15</sup>. The reader

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<sup>15</sup> 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<sub>LFT</sub>++), 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 <sub>LFT</sub> PLAY    | [LIS/NGT] |
| ‘The child plays’               |           |
| b. CHILD <sub>LFT</sub> ++ 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 «...*marcatatura 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<sub>1</sub> CITTÀ VISITARE PIACERE  
 I city visit like  
 ‘I like to visit cities’  
 ‘I like to visit the city/some cities’

- b. IX<sub>1</sub> dp.  
 CITTÀ<sub>3</sub> (IX<sub>3</sub>) IX<sub>1</sub> VISITARE PIACERE  
 I city (index) I visit like  
 ‘I like to visit that city’

- c. IX<sub>1</sub> (GENOVA, TORINO) dp.  
 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 1<sup>st</sup> person index IX<sub>1</sub> (‘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]

top

PIX<sub>1</sub> BROTHER NIX<sub>RGT</sub> THIS<sup>^</sup>EVENING IX<sub>RGT</sub> RGT VISIT<sub>1</sub>  
 ‘My brother, tonight he will visit me’

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

BOEK IX<sub>RGT</sub>, IX<sub>LFT</sub> WEGGOIEN (IX<sub>RGT</sub>)  
 book there/that he throw away (it)  
 ‘He threw away the book’

In (27.a), the 1<sup>st</sup> person possessive index, glossed PIX<sub>1</sub>, precedes the noun, whereas the location-assigning nominal index (here pointing to the signer’s right) NIX<sub>RGT</sub> 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<sup>^</sup>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<sub>RGT</sub>. 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 3<sup>rd</sup> 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 1<sup>st</sup> 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<sub>1</sub> BEACH GO<sub>RGT</sub>. IX<sub>1</sub> LIX<sub>RGT</sub> PLAY, SWIM, WALK  
 ‘Yesterday I went to the beach (and) there I played, swam (and) walked’
- b. IX<sub>1</sub><sup>ARC</sup> PLAY LIX<sub>RGT</sub> [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<sub>LFT</sub>) assigning ‘Amsterdam’ a location (signer’s left) for subsequent agreement, a 1<sup>st</sup> person pronoun (IX<sub>1</sub>) subject of the null copula, and a locative index (LIX<sub>LFT</sub>) 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.

30. top  
 AMSTERDAM NIX<sub>LFT</sub>, IX<sub>1</sub> LIX<sub>LFT</sub> 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 Noun – Quantifier, 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<sub>1</sub> 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).



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<sub>1</sub> PIX<sub>2</sub> MOTHER SEE [NGT]  
 'Yesterday I saw your mother'
- b. YESTERDAY IX<sub>1</sub> PIX<sub>2</sub>++ 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<sub>FORW</sub> / WEEK<sub>BACKW</sub> [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<sub>1</sub> BOOK OLD BUY ...

‘Yesterday I bought an old book’

a. BOOK DIX<sub>LFT</sub> (,) EXPENSIVE [LIS]

b. DIX<sub>LFT</sub> 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<sup>17</sup>, suggesting that the second index is possibly a locative (although Bertone’s Italian translation does not contain a locative).

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<sup>17</sup> 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]

dp	neg.
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++	<i>(dominant hand)</i>	[LIS]
LIX	<i>(nondom. hand)</i>	
‘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 <sub>LFT</sub> BOOK LIX <sub>LFT</sub> (,) 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<sub>LFT</sub> (,) 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<sub>LFT</sub>++ DIX<sub>LFT</sub><sup>ARC</sup> PLAY [LIS]  
 ‘Those children play(ed)/are/were playing’
- b. [NGT: adapted from Vink 2004:35]  
 VANDAAG, KIND++ IX<sup>ARC</sup> 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**<sup>18</sup> (maybe **N-Dem-Loc**) in LIS, and **Dem-N-Loc** in NGT. Data also show that in both

<sup>18</sup> 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 intralinguistic 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))<sup>19</sup>.

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<sup>19</sup> 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.



## Chapter 2

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<sub>1</sub> PEN RED BUY [LIS]  
'I bought a/the red pen'
- b. YESTERDAY IX<sub>1</sub> PEN RED BUY [NGT]  
'Yesterday I bought a red pen'

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

51. RED PEN YESTERDAY IX<sub>2</sub> 2GIVE<sub>1</sub> 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<sub>1</sub> BOOK THREE EXIST [LIS]  
'I have three books'
- b. PEN TWO IX<sub>RGT</sub>, BOTH<sub>RGT</sub> 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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<sup>20</sup> 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-occurrence 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-occurrence 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.  $\frac{\text{top}}{\text{FRIEND(S) PIX}_1 \text{ ALL, (IX}_3^{\text{ARC}}) \text{ DEAF}}$  [LIS]
- b.  $\frac{\text{top}}{\text{ALL FRIEND, DEAF}}$  [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”<sup>21</sup>). 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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<sup>21</sup> The context given was “I have one hearing friend” (all other friends are deaf).

55.

a.  $\frac{\text{top}}{\text{FRIEND(S) OTHER ALL, (IX}_3^{\text{ARC}}) \text{ DEAF}}$  [LIS]

b.  $\frac{\text{top}}{\text{OTHER FRIEND, DEAF}}$  [NGT]  
 ‘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<sub>1</sub>-STRONG  
 book red three CL-TRIPL (are) my  
 ‘The three red books are mine’

b. PEN RED TWO TABLE<sub>RGT</sub> BE<sup>^</sup>PRESENT<sub>RGT</sub> [NGT]  
 ‘There are two red pens on the table’

58. PIX<sub>1</sub> THREE RED CAT<sup>^</sup>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<sub>1</sub>-STRONG  
 book new two DEM (are) my

b.

\_\_\_\_\_dp

LIBRO DUE NUOVO DIX , PIX<sub>1</sub>-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<sub>1</sub>-STRONG RED [LIS]  
‘my red book’

61. top  
PIX<sub>1</sub> OLD BROTHER NIX<sub>LFT</sub>, THIS<sup>^</sup>EVENING IX<sub>LFT</sub> LFT VISIT<sub>1</sub> [NGT]  
‘My old brother, tonight he is visiting me’ (I have two brothers)

62. PIX<sub>1</sub> THREE RED CAT<sup>^</sup>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 contrast, shows a **Dem-A-N** sign order in (64)<sup>22</sup>.

63. dp [LIS: repeated from (59.a)]  
LIBRO NUOVO DUE DIX, PIX<sub>1</sub>-STRONG  
book new two DEM (are) my  
‘These two new books are mine’

64. top [NGT]  
DIX<sub>LFT</sub> OLD BOOK IX<sub>LFT</sub>, IX<sub>LFT</sub> 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

<sup>22</sup> 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-occurrence of demonstratives and possessives in NGT.

66. \_\_\_\_\_<sub>top</sub> [LIS: Bertone, p.c.]  
 BOOK PIX<sub>1</sub> RED DIX<sub>LFT</sub>, UNCLE IX<sub>1</sub> 3GIVE^AS^PRESENT<sub>1</sub>  
 ‘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<sup>23</sup> 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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<sup>23</sup> 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-occurrence 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,  $D^\circ$ , 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  $Q^\circ$  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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<sup>24</sup> Giusti (1993) assumes articles to sit in the head  $F^\circ$  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')<sup>25</sup>. 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 tentative 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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<sup>25</sup> 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.

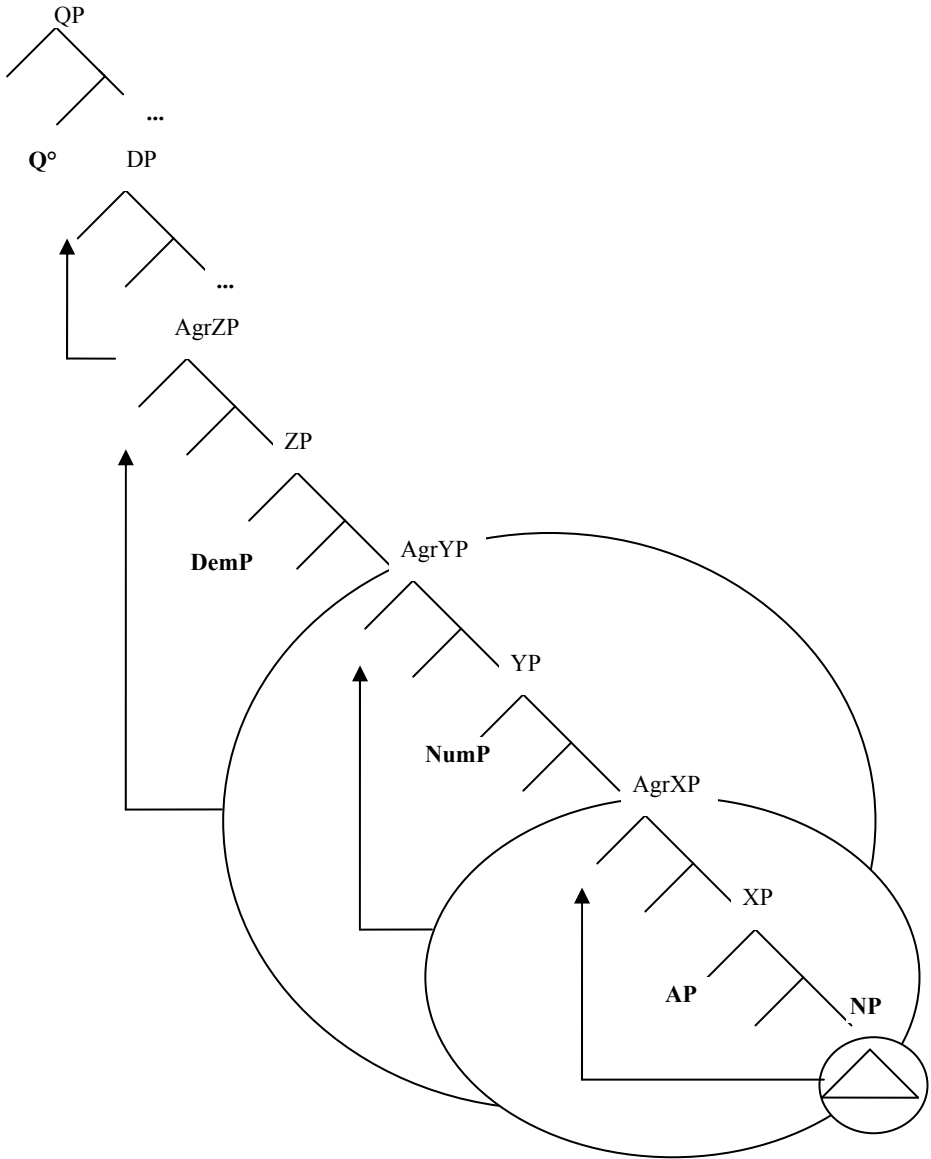
Thus, following Bertone (and not considering classifiers), successive roll-up movements raise constituents leftwards to (the specifiers of) maximal projections, as sketched in (74). The underscore indicates the specifiers of the agreement projections filled by the raised (inverted) constituent(s). The 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.  $[\text{DP } D^\circ [\text{AgrZP Agr}^\circ [\text{ZP DemP } Z^\circ [\text{AgrYP Agr}^\circ [\text{YP NumP } Y^\circ [\text{AgrXP Agr}^\circ [\text{XP AP } X^\circ [\text{NP N}]]]]]]]]]$
- b.  $[\text{DP } D^\circ [\text{AgrZP Agr}^\circ [\text{ZP DemP } Z^\circ [\text{AgrYP Agr}^\circ [\text{YP NumP } Y^\circ [\text{AgrXP } [\text{NP N}] \text{Agr}^\circ [\text{XP AP } X^\circ t_{\text{NP}}]]]]]]]]]$
- c.  $[\text{DP } D^\circ [\text{AgrZP Agr}^\circ [\text{ZP DemP } Z^\circ [\text{AgrYP } [\text{AgrXP } [\text{NP N}] \text{Agr}^\circ [\text{XP AP } X^\circ t_{\text{NP}}]]] \text{Agr}^\circ [\text{YP NumP } Y^\circ t_{\text{AgrXP}}]]]]]]]$
- d.  $[\text{DP } D^\circ [\text{AgrZP } [\text{AgrYP } [\text{AgrXP } [\text{NP N}] \text{Agr}^\circ [\text{XP AP } X^\circ t_{\text{NP}}]]] \text{Agr}^\circ [\text{YP NumP } Y^\circ t_{\text{AgrXP}}]] \text{Agr}^\circ [\text{ZP DemP } Z^\circ t_{\text{AgrYP}}]]]$
- e.  $[\text{DP } [\text{AgrZP } [[[[\text{NP } \text{Agr}^\circ [\text{AP } X^\circ t_{\text{NP}}]]] \text{Agr}^\circ [\text{NumP } Y^\circ t_{\text{AgrXP}}]]] \text{Agr}^\circ [\text{ZP DemP } Z^\circ t_{\text{AgrYP}}]]] D^\circ t_{\text{AgrZP}}]$

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  $Q^{\circ}$ , which is above DP. The fact that LIS quantifiers appear postnominally suggests then that pied-pipings do not only move constituents 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**<sup>26</sup>, 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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<sup>26</sup> Recall that elements separated by a slash are those for which I have not been able to detect a linear order.

76.

- a. [<sub>DP</sub> D° [<sub>AgrZP</sub> Agr° [<sub>ZP</sub> DemP Z° [<sub>AgrYP</sub> Agr° [<sub>YP</sub> NumP Y° [<sub>AgrXP</sub> Agr° [<sub>XP</sub> AP X° [<sub>NP</sub> N]]]]]]]]]]
- b. [<sub>DP</sub> D° [<sub>AgrZP</sub> Agr° [<sub>ZP</sub> DemP Z° [<sub>AgrYP</sub> Agr° [<sub>YP</sub> NumP Y° [<sub>AgrXP</sub> [NP N] Agr° [<sub>XP</sub> AP X° *t*<sub>NP</sub>]]]]]]]]
- c. [<sub>DP</sub> D° [<sub>AgrZP</sub> Agr° [<sub>ZP</sub> DemP Z° [<sub>AgrYP</sub> [AgrXP [NP N] Agr° [<sub>XP</sub> AP X° *t*<sub>NP</sub>]]] Agr° [<sub>YP</sub> NumP Y° *t*<sub>AgrXP</sub>]]]]]]

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 preminally and follow the universal merge order as do NGT prenominal numerals and adjectives, for instance. If pied-piping applies, the elements appear postminally 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  $D^\circ$  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  $D^\circ$  and the demonstrative is generated lower than  $D^\circ$  together with the (optional) locative, thus accounting for sentences as (77.b). If no article is present in  $D^\circ$ , 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  $D^\circ$ . 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 [+definiteness]. In this way, the demonstrative always appears postnominally, as in (45.a), accompanied by an optional locative, as in (42). NGT, in contrast, 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... D° [AgrZP ... Agr° [ZP [Dem Loc] Z° [NP N]]]] (DemLoc-N)
- b. [DP... D° [AgrZP [NP N] Agr° [ZP [Dem Loc] Z° tAgrNP]]] (N-DemLoc)
- c. [DP [Dem] D° [AgrZP [NP N] Agr° [ZP [tDemP Loc] Z° tAgrNP]]] (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 ... D° [AgrZP ... Agr° [ZP [Dem] Z° [NP N] ] ] ] (Dem-N)

b. [DP ... D° [AgrZP [NP N] Agr° [ZP [Dem] Z° tAgrNP ] ] ] (N-Dem)

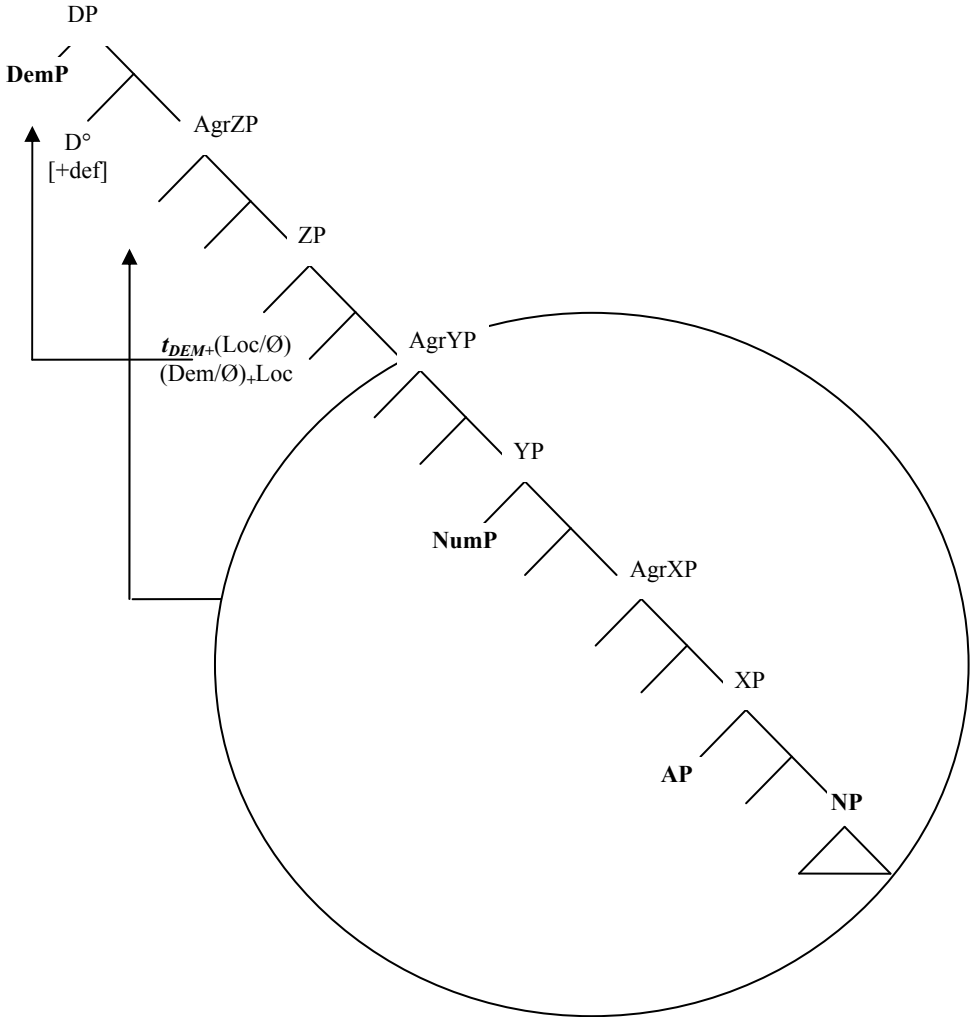
c.1. [DP [AgrZP [NP N] Agr° [ZP [Dem] Z° tAgrNP ] ] D° tAgrZP ] (N-Dem)

or

c.2. [DP [NP N] D° [AgrZP tNP Agr° [ZP [Dem] Z° tAgrNP ] ] ] (N-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**



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 [<sub>DP</sub> [[[N]-A *t*]-Num *t*] D°] or with noninverting pied-piping of the “picture of who” type [<sub>DP</sub> [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<sup>27</sup> 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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<sup>27</sup> 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<sub>1</sub>-STRONG RED

[LIS: rep. from (60)]

‘my red book’

82.

[Arabic: discussed in Cinque 2000]

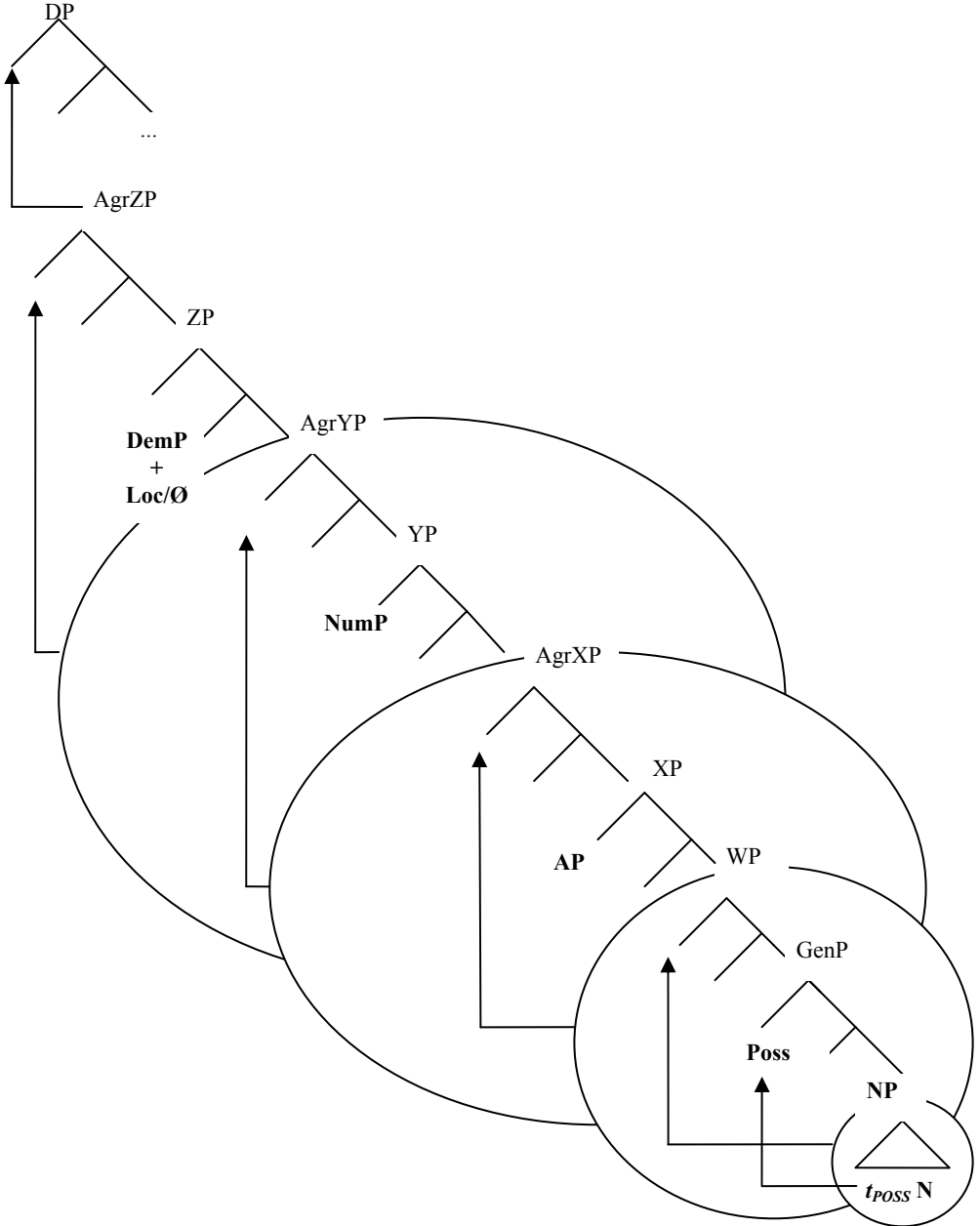
(daxal-tu) daar-a r-rajul-i l-wasi’at-a

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;DP] 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 preminally 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<sub>1</sub> BROTHER NIX<sub>RGT</sub> THIS<sup>^</sup>EVENING IX<sub>RGT</sub> RGT VISIT<sub>1</sub>  
 ‘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  $D^{\circ}$ <sup>28</sup>. 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  $D^{\circ}$ , 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  $D^{\circ}$  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  $D^{\circ}$  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-occurrence of demonstratives

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<sup>28</sup> Assuming that NIXes occupy  $D^{\circ}$  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, preceding 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 straightforwardly 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 prenominal. 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  $D^{\circ}$  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



## Chapter 2

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.