The syntax of noun modification in Italian Sign language (LIS)[1]

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1. Introduction

In this paper I will discuss noun modification in LIS. Before starting the discussion some clarification is at stake.

The grammatical categories of Italian Sign Language (LIS) are not morphologically distinguished: nouns, verbs or adjectives have the same lexical form. How can words of LIS be categorized in different classes? At first glance it seams that there are no distinctions in LIS.

In recent syntactic literature, the noun phrase has been analysed as having a structure similar to clausal structure (Abney 1987; Bernstein 1991, 2001; Cinque 1994; 2000; Giusti 1993, 1996, 2002). This leads us to the prediction that in LIS a phrase is initially indistinguishable if verbal or nominal. In the next section I try to delineate the principal facts that signal if a word functions as a noun, an adjective or a verb. I will claim that the presence of a determiner is a means to distinguish a nominal constituent. In this introductive part I introduce two key factors to interpret the phenomena described hereafter: non-manual markers and the pointing sign. Non-manual markers consist in various facial expressions, head and shoulder movements, mouthing, and similar markers that are added to the hand signs to create meaning. Their role in syntax can be compared to the role of suprasegmental features. As suprasegmentals do in many oral languages, non-manual markers may indicate whether a sentence is a question, a command, or a statement. They can give emphasis, contrast or focus. Moreover, in LIS, their role in sentence is fundamental because they substitute other linguistic elements not encoded by functional manual signs (for example some modification or the verb *to be* when it is a copula).

The pointing sign is a linguistic means to distinguish a specific referent, it has regular distribution in the sentence, and it has a specific grammatical function. It is different from a pointing gesture, which can also accompany deictic word in oral language, and it can overlap with it. Pointing signs can be demonstratives and pronouns, they encode the space features of *proximality to* or *distality from* the speaker and the addressee that are fundamental for the interpretation of the referent. Space features assign referential meaning to the pointed space that can result in morphological agreement with some verbs.

Section 2 will distinguish nominal and verbal constituents in LIS. Section 3 will observe that normally in LIS adjective agreement is not obligatory, instead we can speak of "assimilation", in the sense pointed out by Mac Laughlin for ASL (1997:206), and the adjective agreement is overt only when the adjectives are pronominal forms of the noun. Section 4 reports on attributive and predicative adjectives that are distinguished by means of suprasegmental features. Section 5 regards direct modification and its development in compound nouns. Section 6 shows distributional property of direct modifier. In section 7 I explain the structure of direct and indirect modification.

2. The distinction between nominal constituent and verbal constituent in LIS

In the following examples, we can observe the phonological absence of the copula in LIS, the position of some adjectives, the distinction between NP and VP and the syntactic value of some facial expressions. For example, in (1), the word *antique* is a predicate, in (2) it is an adjective.

$$\overline{\qquad\qquad DP\qquad} \quad \overline{\qquad\quad VP\qquad}$$

1. *d.h.*:   FURNITURE$_i$ ANTIQUE
   n.d.h.: $\underline{\qquad IX\qquad}$ $_i$
           The furniture is antique

$$\overline{\qquad\qquad\qquad\qquad\qquad DP\qquad} \quad \overline{\qquad VP\qquad}$$

2. *d.h.*:   FURNITURE$_i$ ANTIQUE IX$_i$ BROKE
           The antique furniture is broken

The non-manual markings that distinguish the nominal constituent from a verbal constituent can be different in different signers for intensity, or for the kind of

expression, but generally consist in raised eyebrows and the assumption of a slightly raised position of the head with a jutting forward of the chin. The lines labelled DP or VP indicate the domain over which the non-manual marking occurs and the manual sign with which it is co-articulated. These two kinds of non-manual markings show that, although the kind of expression or body movement are not so fixed, there is a break between the nominal constituent and verbal constituent. In both (1) and (2) we can see that the word *antique* is characterized by two distinct expressions and by the post-nominal position in the sentences. In (1) the break is between the noun and its predicate. Since there is no copula, it is possible to argue that *antique* is the verbal constituent. As we can see in (1) and (2), the pointing (IX in the glosses) in LIS is the last element of the noun phrase. In previous works (cf. Bertone 2007, 2009), I claimed that the pointing is the phonetic realization of space features that are distinguishable in terms of *proximality to* or *distality from* the speaker and the addressee. The point in space is referential because it realizes the referent of the noun phrase and triggers agreement. For this reason, I propose it is a determiner inserted in D. In (1), it is not possible to have the pointing sign (IX) after the predicate. If it is necessary to have a pointing sign, *i.e.* if we need to specify which piece of furniture among many, then this must be necessarily put after the noun. In the glosses, it is possible to note that the pointing sign is articulated, between the noun and its predicate, by the non-dominant hand (*n.d.h.*). In (2) the break is between the pointing sign (IX) and the sign *broke*, so the pointing sign is the last sign of the nominal constituent; the sign *antique* is characterized by the same non-manual marker of the noun; a break between the *furniture* and *antique* would make the sentence non-grammatical.

Antique in (1) cannot be the head of a relative sentence; instead in (2) we can insert a relative clause in which the noun phrase (*furniture antique*) is the head of a relative clause as we can see in (3):

<div align="center">

                DP   relative   VP

</div>

3.   FURNITURE$_i$ ANTIQUE (IX$_i$), PE$_i$ UNCLE MY GIVEN$_{1p}$ BROKE
      The antique furniture, which my uncle gave me, is broken

To summarize, non-manual markings are prosodic elements that can change a predicate NP, like *antique* in (1), into an argument DP like *antique* in (2). The same prosodic element permits us to distinguish whether an element is part of a nominal constituent. In the following sentence the adjective *red,* with its pointing sign, is not part of the DP.

<div align="center">

              DP   DP   VP

</div>

4.   FURNITURE$_i$ ANTIQUE (IX)$_i$, RED (IX)$_i$, BROKE

The antique furniture, the red one (which is red), is broken

The two DPs are separated by a pause and/or by a nod of the head. The facial expression can spread either over the first noun phrase, or over the second, or over both with an interruption as is the case in (4).

It is now clear that non-manual markings help us distinguish the properties of constituents, their role can be assimilated to functional elements that in many languages are expressed phonetically or prosodically.

3. Adjective agreement

In LIS, nouns and verbs are divided in different classes related to the possibility they have to be reduplicated in the plural. For example there are two classes of nouns (Pizzuto 1987; Pizzuto, Giuranna, Gambino 1990; Pizzuto, Cameracanna, Corazza, Volterra 1997 a.o.), one is articulated on the body and generally, cannot be reduplicated, the other is articulated in space and can be reduplicated. So the first class is "plain" the second class is "agreeing". In both cases it is possible to use a quantifier to express plurality. The verbs are divided in three classes concerning the agreement with their arguments (cf. Pizzuto 1987; Caselli, Maragna, Pagliari Rampelli, Volterra 1994).

Like nouns and verbs, adjectives are also divided into two classes: the agreeing adjectives, located in space (*tall, new, blue*), and the non-agreeing adjectives, located on the signer's body (*pretty, old*, *red*). Moreover, "form" and "dimension" adjectives, that are homophones to the classifiers predicates, also are agreeing adjectives. These latter ones will be not discussed in the present paper for reasons of space. (But cf. Bertone (2007) for a proposal on agreement of modification incorporated to the classifier).

The morphological agreement of adjectives involve modification of features of space and orientations of the hand. Both have to be localized in the same point of space in which we have previously localized the noun. With uninflected adjectives (those articulated on the signer's body that cannot modify the point of articulation) the agreement is given by body or head tilt, which often also involves eye gaze turning towards the point indicated by the determiner (index) or by the noun[2] articulated in a specific point of space. Adjective agreement is not obligatory: often agreeing adjectives are not articulated in the same point in which the noun is localized but are articulated in

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[2] In case of a plain noun, that cannot be located in space, the classifier of the noun replace it, as pronominal form, and (Bertone 2007).

neutral space. If there is a pointing sign, it has to agree while the adjective is assimilated to the pointing sign. In this case we can speak of "assimilation" in the sense pointed out by Mac Laughlin for ASL (1997:206). That is, the adjective is shifted to the location of the referent followed by the pointing sign.

Shifting of the adjectives, to a point in space, is obligatory with a conjunction between two referents whose referent is associated to a specific point (5), and when the noun is missing (6).

<u>   head direction i </u> <u>   head direction k</u>
5. BOOK$_i$ BLUE$_i$ BOOK$_k$ NEW$_k$,
      The blue book and the new book

<u>   head direction i </u> <u>   head direction k</u>
6. (speaking about books) BLUE$_i$ (IX)$_i$ NEW$_k$ (IX)$_k$,
      The (that) blue and the (that) new

In LIS, the agreement of the adjective is overt when the adjectives are pronominal form of the noun, as we see in (6) in which each adjective (*blue* and *new*) refers to a specific book. The pointing sign in (6), is the determiner and the adjective is assimilated to the pointing sign. In conclusion adjectives require agreement when they assume the function of a determiner.

4. Distributional property and non manual markers

As we have seen in section 2, the DP in LIS is characterized by specific non-manual elements that spread over the entire phrase. Inside this extension the noun is followed by an adjective. Contrary to languages such as Italian, English, in which the position of the adjective gives information about its attributive or predicative role, in LIS both kinds of adjectives follow the noun. Nevertheless, we will soon see that the difference between the two kinds of modification is indicated by specific non-manual features.

In LIS, all kinds of adjectives are post-nominal. Attributive and predicative adjectives are distinguished by a different marking. The first ones have the same facial expression of the noun referred to, moreover it is impossible to insert lexical material between the noun and its adjective; the latter are characterized by more salient facial expression, such as squinted eyes or raising eyebrows, which are more emphasized compared to the

expression of the whole DP. Moreover, it is possible to have a pause, often with a head nod, after the predicative adjective, but not after an attributive adjective. It is also possible to introduce a particular sign, or gesture, made by the manual handshape "5" (open hand with outstretched fingers) or by manual configuration "f" (open hand with thumb and index fingertips touching each other) after the predicative adjective (sentences (7) and (8)).

       <u>   non manual expression of DP   </u>

<div align="center"><u>eyebrows more raised</u></div>
<div align="center"><u>or squinted eyes</u></div>

7. ICE CREAM GOOD, **ITALIAN** COST MORE
    A good ice cream that is Italian, costs more.

       <u>   non manual expression of DP   </u>

<div align="center"><u>eyebrows more raised</u></div>
<div align="center"><u>or squinted eyes</u></div>

8. ICE CREAM ITALIAN, **GOOD** COST MORE
    An Italian ice cream, that is good, costs more.

In the sentences (7) and (8), the adjectives in bold are prosodically more marked and there is a slight pause between the two adjectives indicated by the comma in the glosses. The pointing sign, that in non-marked forms is at the end of the DP (sentences (1) and (2)), cannot be between a noun and its direct modifier.

       <u>   non manual expression of DP   </u>

<div align="center"><u>eyebrows more raised</u></div>
<div align="center"><u>or squinted eyes</u></div>

9. ICE CREAM (*IX) GOOD, **ITALIAN** (IX) COST MORE
    A good ice cream, that is Italian, costs more.

As we have seen above, both attributive and predicative adjectives are post-nominal. However, in LIS there are some forms in which the attributive adjective is pre-nominal such as *prime minister* and *former husband* or *former pupil*. In these cases we have some evidences of borrowing from the Italian language: the word "*former*", in Italian language "*ex*", is made by a sign crossing the indexes finger on the shoulder. That is, the word "*ex*" is given by a fingerspelled word from which the "E" is dropped and letter

"X" is articulated using the old system of fingerspelling. The point of articulation, that is on the shoulder, means *past*. In the same way, the word *prime*, in Italian language "*primo*" (first), is given by a sign (thumb upwards) that is the literal translation of the Italian word. This clearly means that these signs are words borrowed from Italian, they were direct modifiers and became into compound nouns. These words can therefore be regarded as compound nouns rather than adjectives followed by a noun. This fact proves that direct modification can give rise to the formation of new compound nouns (Sproat & Shih 1988).

The rules of intonation, in LIS accounted for by facial expressions, seem to follow the same rules of direct and indirect modification of Mandarin as pointed out by Sproat & Shih (1990). Direct modification in LIS, is accounted for the same expression of the face, without interruption, which spreads over the noun and its modifier. In sentences (7) and (8) the pause in intonation between two adjectives, the intensification of the facial expression that emphasizes the second adjective, the fact that this has the same facial expression of the relative clause, all provide the evidence of the fact that the adjectives in bold are indirect modifiers. In the next sentence (10) we see a typical expression of a relative clause. In LIS it is characterized by specific non-manual expressions such as dimpled cheeks and squinted eyes.

<div align="center">

dimpled cheek

squinted eyes

</div>

10. DRESS RED IX_{1p+2p} YESTERDAY SEE $CL_{num+position}$, IX_{1p} BUY DONE
     The red dress that we have seen yesterday among the others, I bought it

Sentence (10) does not have a relative pronoun[3], moreover the non-manual features characterizing it (eyebrows more raised or squinted eyes) are identical to those that characterize the marked phrases in bold in the sentences (7), (8) and (9). Chomsky (1955), Kayne (1994), Larson, (2004) Cinque (2005a, 2005b), and other authors claim that predicative adjectives are derived by reduced relative clauses. LIS give evidence for this hypothesis. Further evidence for this is the observation that marked adjectives are a

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[3] In Cecchetto, Geraci Zucchi (2006). A relative clause is characterized by specific non-manual feature ad by a relative pronoun (pro-rel) that in sentences (7a) and (10a) is given by the word PE. There are attested case in which the relative clause occour without the PE (I tanks Mirko Santoro and Fabio Poletti for the colloquies on these topics). The function of PE seams invests fields of research larger. Branchini, Donati (2005).

kind of indirect modification. In sentences (7), (8) and (10), it is possible to introduce a sign, glossed as PE by a phonetic sound pronounced with it, that also characterizes the relative clause in LIS (cf Cecchetto Geraci Zucchi (2006), Branchini (2009), Brunelli (2009)).

<div style="text-align:center;">

_____ non manual expression of DP

_____ squinted eyes

</div>

7a.   ICE CREAM GOOD, (PE) **ITALIAN** COST MORE

<div style="text-align:right;">

dimpled cheek

_____ squinted eyes

</div>

10a.   DRESS RED (PE) IX_{1p+2p} IESTERDAY SEE $CL_{num+position}$, IX_{1p} BUY DONE

The interpretation of the relative clause is restrictive. The meaning of the adjective ITALIAN in (7a) is ambiguous between restrictive and non-restrictive, the reason will be clear below.

Since marked adjectives are derived from a reduced relative clause, they are not subject to the order restriction of direct modification (Sproat & Shih 1991; Scott 2002). The non-marked order of the sentence (7) is given in (11):

_____ non manual expression of DP

11.   ICE CREAM ITALIAN GOOD, COST MORE
      A good Italian ice-cream costs more

_____ non manual expression of DP

11a.   ? ICE CREAM GOOD ITALIAN, COST MORE

These five pieces of evidence (intonation pause, facial expression identical to the expression of relative clause, possibility of PE insertion, restrictive reading of marked adjectives, free order of adjectives) lead us to believe that these adjectives are predicative and the different kind of modification, direct or indirect, is left to prosodic markers.

5. Some aspects of direct modification

Before analyzing the distribution of direct modifiers inside DP, some aspects regarding relational adjectives and adjectives of origin have to be looked at. The category of adjectives derived by nouns in LIS is not signalled by a specific morpheme. In LIS words, with same semantic content but belonging to different categories, such as *financial* ad *finance* are not morphologically distinguished and the sign is identical for the noun and for the adjective. The possibility to identify the category of belonging to, it is left to the position in the phrase, the adjective which is next to the noun has the same non-manual features and any kind of element can be insert between them.

<u>non manual expression of DP</u>

12. ACT FINANCE
     Financial act

13. *FINANCE$_j$ IX$_j$ ACT$_j$

<u> expr DP</u>   <u> squinted eyes</u>
14. *ACT   FINANCE

Relational adjectives are direct modifier. In LIS they are widespread, for example we find the following expressions:

15. a. MAN GLASS
        Man with glasses

     b. MAN HAT
        Man with hat

     c. BOOK HISTORY
        History book

The contrast of the last phrase (15c) to "history of book" is given by the phrase BOOK HISTORY$_j$ POSS$_j$. Where *poss* is a sign that needs to mark the genitive.
As relational adjectives, adjectives of origin too have the same non-manual features that spread over the noun, and any kind of element can insert between them. It is necessary to explain that if the characterization is not pragmatically strong, there needs to be a possessor marker such as BOOK HISTORY POSS (sentences (16c), (16e). Instead, if

the adjective of origin indicates the name of a place generally recognized as typical, the possessor marker is not necessary (contrast (16a) and (16d).

16.   a. WINE FRENCH
         Franch wine

      b. ?WINE FRANCE$_j$ POSSj

      c. WINE AMERICA$_j$ POSS$_j$
         American wine

      d. ?WINE AMERICA

      e. PIZZA POLAND$_j$ POSS$_j$
         Polish pizza

      f. ?PIZZA POLAND

      d. PIZZA NAPOLI
         Neapolitan pizza

From this we conclude that modifiers behave differently depending on the grammatical category of belonging to. Moreover we can note that some words became compound depending on the use in different communities of deaf.

6. Order restriction of non-marked adjective, or direct modifier, in LIS

Showing that direct modification is not non-manually distinct from the noun, but is joint with the noun through the same non-manual feature, we can now shift our attention to look at the hierarchy of attributive adjectives in LIS.

Sproat & Shih (1688, 1990), state that there are restrictions on the ordering of the adjectives, the restrictions are universal and they apply only to direct modifiers. As cross-linguistically it is not a unitary phenomena, the order of adjectival modification is viewed in terms of head-proximity rather than of linear ordering. The fixed order is: Quality>Size>Shape>Colour>Origin.

In LIS, as we have seen, modifiers, both direct and indirect, follow the noun and the order of the indirect modifiers is arbitrary. However it is not simple to establish the adjective order that involves shape and size, as they are homophonous to the classifiers. Classifiers are selected on the basis of the shape of the noun and in the absence of elements such as numerals, we cannot distinguish a shape adjective from a classifier (for more information on this cf. Bertone 2007, 2008)[4]. Size modification is incorporated in the shape, that means that size modification too involves a classifier. Nevertheless, the attribute of size can be carried by a morpheme of dimension given by the different dimension of the sign or of its classifier. In any case dimension modifiers involve some facial expression (for example open eyes in order to express something very big, squinted eyes to express something very little) that can be confused with non-manual features of indirect modification. For these reasons, in order do not confuse different kind of expressions; we will only focus on lexical modification leaving other kind of modification to further studies. Regarding lexical adjectives we can see the same kind of adjectives to have an order exactly in reverse to universal order, that is Origin>Colour>Quality. We will observe the hierarchy of these adjectives by combining two adjectives in each example.

20. a. Origin precedes colour: VASE CHINA RED
                                  *VASE RED CHINA

    b. Origin precedes quality: VASE CHINA OLD
                                  *VASE OLD CHINA

    c. Colour precedes quality: VASE RED OLD
                                  *VASE OLD RED

In any case the noun cannot appear between two adjectives, it can only be in the initial position.
When shape and dimension adjectives refer to the same constituent, in which there is a classifier, they are incorporated into the classifier. For this reason, they cannot be selected to establish which is the previous with respect to the other. This requires another type of analysis such as the grammatical status of the classifier in which modifier is only a morpheme.

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[4] More research is needed in order to understand the structure of classifier in the DP.

In order to account the reversal of adjective order in LIS, I am taking the position of Cinque (1994, 2005a, 2005b) who, criticising the common assumption that adjectives are adjoined to a maximal projection (Abney 1987, Bernstein 1991, Carstens 1991 et. al.), states that adjectives are phrases generated in specifiers of distinct functional projections, between the D and NP.

Scott (2002) examines the adjective order restriction (AOR), following the position of Cinque (1994) and making a parallel between DP and CP, taking into account the adverbial order of Cinque (1999), he identifies the functional projections that are intrinsically related to the aspect of their semantic interpretation outlining that there exists an interaction between the syntactic and semantic components of grammar. The functional projections maintain a semantic relationship with every class of modifiers (verbal in CP and nominal in DP) in their specifiers so the interpretation of the adjectives is influenced by a hierarchical order of the projection of FP in which AP is generated. The syntactic tree is given in the following figure.

Fig. (2)
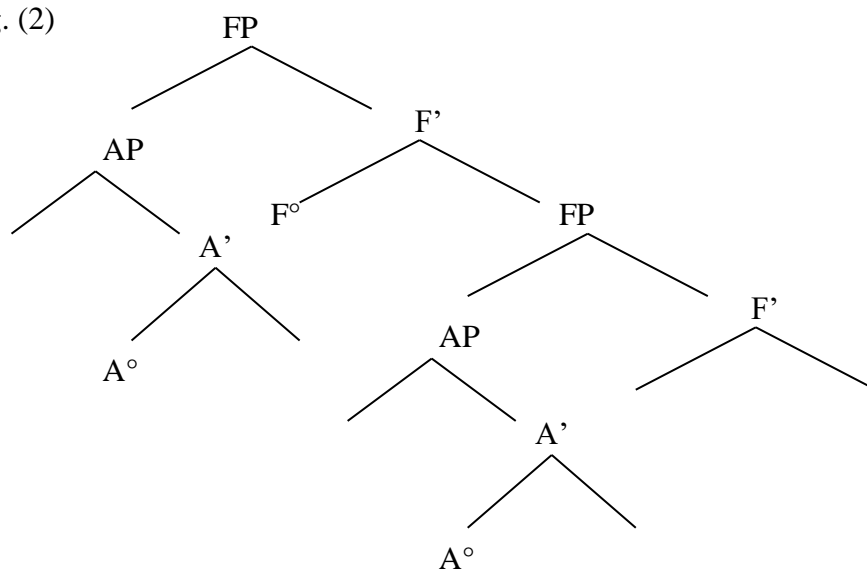
As Scott (2002) outlines, the projection FP can host in its specifier elements such as PP, AdvP, ClP that are related to the semantic interpretation of the FP. In that sense, it is possible to understand the interpretation of a relational adjective as in MAN GLASS or BOOK HISTORY, in which GLASS and HISTORY is generated in the projection of FP related to "subjunctive comment", or PIZZA NAPLES in which NAPLES receives its interpretation because is generated in FP related the "Nationality/OriginP".

The words in LIS that need the possessive marker such as PIZZA POLAND$_j$ POSS$_j$ would be a PP, instead of an AP, in the same position of FP.

This argument could contribute to the definition of the position of classifier too. But this problem needs further research.

7. Structure of Direct and indirect modification

We adopt the antisymmetry of syntax (Kayne 1994), and Cinque's (2005b) claim that the projections of direct modification are generated near the noun, while the indirect modification, deriving from a reduced relative clause, are in a higher position of extended projection of DP. Cinque (2005b) provides a projection of AgrP over every FP that hosts a modifier, in order to host in Spec AgrP the movements of NP that raises by its lower positions of the extended projection of DP. The NP moves successively to each Spec pied-piping the category that dominates it, in a roll-up fashion that reverses the order of the modifiers and obtains the noun in initial position.

This assumption can explain the inverted order of modifier in LIS. Let us observe the sentences (7), renumbered here as (21), and the sentence (22):

<u>   non manual expression of DP</u>

<u>eyebrows more raised</u>

<u> or squinted eyes</u>

21. ICE CREAM GOOD, **ITALIAN** COST MORE
    An Italian ice cream that is good, costs more.

<u>head forward without interruption</u>

22. VASE CINA BIG
    A big Chinese vase

The adjective of origin in (21) has non-manual markers in the sense that it has a free order in the sentence. The movement of the noun is the following:

Fig.(3)
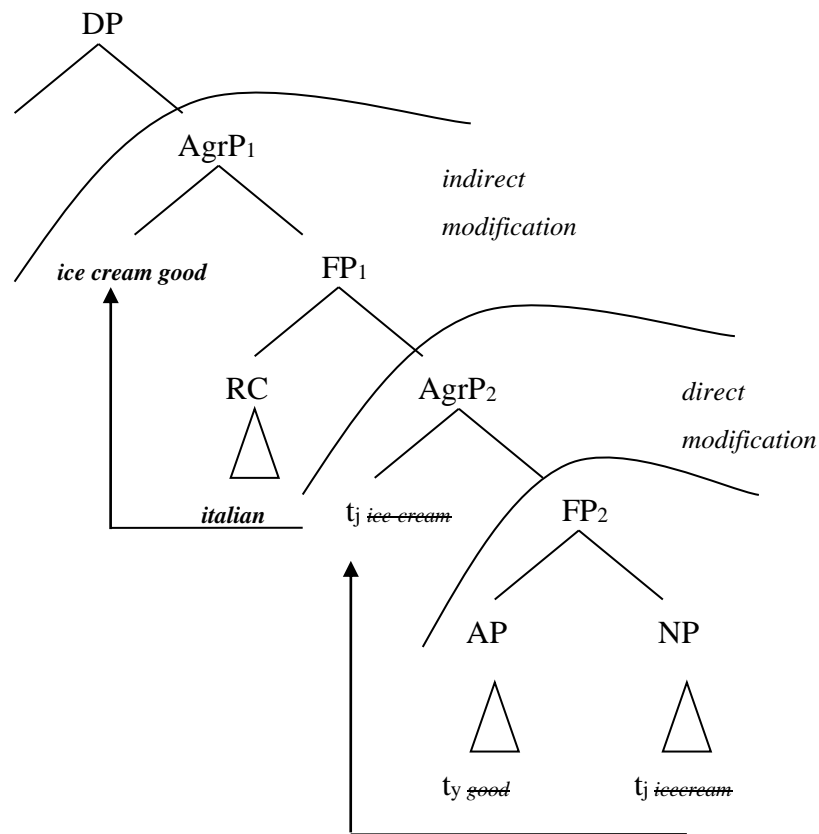
The NP moves from the position in which it is base-generated, it rolls up to the left of the AP and raises to the position of the specifier of AgrP where it checks its agreement feature against AgrP°. AgrP$_2$ dominates FP$_2$. The AP is base-generated in the specifier of FP$_2$. Both AgrP and FP raise and, stepping over the FP of predicative adjective, will be host in the specifier of AgrP$_1$. In this way direct modification will be to the left of indirect modification. This proposal can explain the distribution of non-manual features: some features (raised eyebrows, slightly raised position of the head with a jutting forward of the chin) spread over the entire domain of DP, other features (squinted eyes, dimpled cheeks) overlap the first spreading over the domain of indirect modification (relative clause). The raising of modified NP over the projection of the relative clause, explains the restrictive interpretation of the predicative adjective ITALIAN. This is equivalent to saying that in the group of good ice creams only those which are Italian cost more. In the sentence (22) the adjective of origin is not prosodically marked, for

this reason it is near the adjective and it modifies directly the noun; the measure adjective (BIG) modifies the modified noun (Sproat a Shih (1988)):

22. VASE CINA BIG
     A big Chinese vase

VASE is initially modified from the provenience adjective:

[$_{FP1}$ [$_{AP1}$ CINA] [$_{NP}$VASE]]

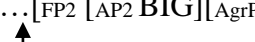The adjective of dimension AP$_1$ modifies the modified noun:

[$_{FP2}$ [$_{AP2}$ BIG][$_{FP1}$ [$_{AP1}$ CINA][$_{NP}$VASE]]]

According to the movements illustrated in fig. (3), for the sentence (21) we have the following movements:

[$_{AgrP2}$ …[$_{FP2}$ [$_{AP2}$ BIG][$_{AgrP1}$… [$_{FP1}$ [$_{AP1}$ CHINA] [$_{NP}$ VASE]]]]]

[$_{AgrP2}$ …[$_{FP2}$ [$_{AP2}$ BIG][$_{AgrP1}$ [$_{NP}$ VASE] [$_{FP1}$ [$_{AP1}$ CHINA]]]]]

[$_{AgrP2}$ [$_{AgrP1}$ [$_{NP}$ VASE] [$_{FP1}$ [$_{AP1}$ CHINA]]][$_{FP2}$ [$_{AP2}$ BIG]]]

In the same manner, we can explain the other orders of adjectives in the sentences indicate above.

8. Some consideration on Greenberg's Universal 20: the order of demonstrative numeral adjective and noun

Greenberg's (1963) Universal 20 observes that in pre-nominal position the order of demonstrative, numeral and adjective is: Dem>Num>A> **N**oun. In post-nominal position is the same, that is **N**> Dem>Num>A or the mirror order **N**> A >Num> Dem.

Cinque (2005) states that the post-nominal order has proven both too restrictive and too permissive. He explains, following Kayne's (1994) antisymmetry of syntax, how the other orders attested in natural languages can be derived. Cinque clarifies that of 24 possible orders only 14 are attested in natural languages. In this section, I will consider the orders of the four elements attested in LIS. I will exploit the assumption of Cinque who states that the deep order is the pre-nominal order of Greenberg's Universal 20 (Dem>Num>A>**N**). Cinque demonstrates that derivation of other orders is due to total or partial raising of NP plus *pied-piping* of the categories that dominates the NP.

Let us consider a sentence in which numeral, demonstrative and adjective modify the noun. The more natural order in LIS is **N** > A > Num > Dem. Other orders are not grammatical but scrambled orders require specific non-manual markers. As regards the order of adjectives less marked is the next:

21. $\overline{\qquad\qquad\text{DP}\qquad\qquad}$
    BOOK NEW TWO IX$_i$, MINE
    This two new books are mine

Following Cinque (2005), this order has a derivation from the order:

[$_{AgrP3}$ …Dem….[$_{AgrP2}$ ….Num [$_{AgrP1}$ A [$_{NP}$N]]]].

Involving raising of NP to the specifier of AgrP that dominates the adjective, we have:

[$_{AgrP3}$ …Dem….[$_{AgrP2}$ ….Num [$_{AgrP1}$[$_{NP}$N] A]]]
with successive *pied-piping* of the other modifiers:

[$_{AgrP3}$…Dem….[$_{AgrP2}$ [$_{AgrP1}$[$_{NP}$N] A]….Num]]

[$_{AgrP3}$…[$_{AgrP2}$ [$_{AgrP1}$[$_{NP}$N] A]….Num] Dem….]

Others attested order in LIS are (23), (24) and (25):

N>Num>A>Dem:

23. $\overline{\qquad\qquad\text{DP}\qquad\qquad}$
    BOOK TWO NEW IX$_i$, MINE

In case (23) the sentence has a derivation with raising of NP without *pied-piping* around A and Num, followed by a raising plus *pied-piping* around the demonstrative.

Dem>N>A >Num >index:

$$\underline{\hspace{6cm}}_{\text{DP}}$$

24.   IX$_i$ BOOK NEW TWO IX$_i$, MINE

Dem>N>Num>A>index:

$$\underline{\hspace{6cm}}_{\text{DP}}$$

25.   IX$_i$ BOOK TWO NEW IX$_i$, MINE

The orders (24) and (25) are rather rare. The pre-nominal position of the demonstrative requires a repetition of the pointing sign at the end of the constituent. The last pointing sign is the determiner that has the same sign of the demonstrative. The last pointing sign can be substituted by a classifier, the classifier has the same function of the determiner because classifier and pointing sign, both have the same space features that I assumed bee in head of DP (Bertone 2007, 2009).

For the order in (24), the derived structure is given from these movements:

[$_{\text{AgrP3}}$ …Dem [$_{\text{AgrP2}}$Num... [$_{\text{AgrP1}}$ A [$_{\text{NP}}$N]]]]

NP moves around the adjective to Spec AgrP$_1$

[$_{\text{AgrP3}}$ …Dem [$_{\text{AgrP2}}$Num …[$_{\text{AgrP1}}$ [$_{\text{NP}}$N] A]]]

Then AgrP$_1$ moves, with remnant movement, to Spec AgrP$_2$

[$_{\text{AgrP3}}$ …Dem [$_{\text{AgrP2}}$ [$_{\text{AgrP1}}$ [$_{\text{NP}}$N]A]Num]]

AgrP$_3$ moves to the specifier of higher DP, leaving the determiner (index) at the end of sentence.

[$_{\text{DP}}$ [$_{\text{AgrP3}}$ …Dem [$_{\text{AgrP2}}$ [$_{\text{AgrP1}}$ [$_{\text{NP}}$N]A]Num]] index].

For the order in (25) the derived structure is given as follows:

$[_{AgrP3} \dots \text{Dem} [_{AgrP2} \text{Num} [_{AgrP1} \dots \text{A} [_{NP} \text{N}]]]]$

NP moves around the adjective to Spec AgrP$_1$

$[_{AgrP3} \dots \text{Dem} [_{AgrP2} \text{Num} [_{AgrP1} [_{NP} \text{N}] \text{A}]]]$

Then it moves, without remnant movement, to Spec AgrP$_2$

$[_{AgrP3} \dots \text{Dem} [_{AgrP2} [_{NP} \text{N}] \text{Num} [_{AgrP1} \dots \text{A}]]]$

AgrP$_3$ moves to specifier of DP, lasting the determiner (index) at the end of sentence.

$[_{DP} [_{AgrP3} \dots \text{Dem} [_{AgrP} [_{NP} \text{N}] \text{Num} [_{AgrP1} \dots \text{A}]]] \text{ index}]$

These facts prove that in LIS the different orders of the elements in DP can be explained by Cinque's (2005) proposal according to which partial rull-up raising of NP can involve other elements included in the extended projection of DP or not.

Conclusions

The evidence discussed in this paper points to the conclusion that LIS, just as other languages is subject to the same rules which are identified observing other natural languages. Some structures of LIS, that are apparently poor, can be explained through systems of grammaticalization of natural languages. In this manner it is possible to explain how the system of direct modification of noun substitutes Prepositional Phrases, how some suprasegmental features constitute a key to explain some grammatical aspects of modification, how the distribution of the adjectives in LIS can be explained through total or partial roll-up raising of NP plus *pied-piping* of the categories that dominates the NP.

This work is the first stage of a more complex study aiming to explore the cartography of modification in LIS taking into account the modification conveyed by classifiers which however does not yet have a full explanation.

Glossary

	Example	Meaning

Symbol

IX	IX$_1$ GO	IX is abbreviation for "index", it is an indicating point.
2p, 3p 1p+2p	IX$_1$ IX$_{1p+2p}$	1p is 1st person etc., 1p+2p refers to 1st person and 2nd person, it is plural.
k,y, j,	BURN$_y$	Letter refer to specific point of space. Which have to agree with other signs.
Cl	Cl	Classifier
d.h.- n.d.h.	*n.d.h.*: FURNITURE$_i$ *d.h*:　　　IX　　$_i$	*d.h.* is dominant hand. *n.d.h.* is non dominant hand. While one hand articulates a sign, the other articulates the other sign. The underlining refers to the holding of the sign.
Line over the words	_____ *GIVE*	It refers the suprasegmental feature that spreads with the word.
( )	(MANY)	Parenthesis refers to the possibility to omit the sign.
*	* IX$_{2p}$ $_1$GIVE$_2$	non grammatical.
?	**?** $_x$TOUCH	quite accepted.
,	HOUSE, WHERE?	Comma means a pause.

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