Simultaneous grammars: two word orders but only one morphology

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ABSTRACT
The talk will be devoted to a peculiar type of code mixing occurring when a sign language and a spoken language are involved (bimodality): while bilinguals are forced to successively alternate their languages in mixed utterances, bimodals have two independent channels available and can combine simultaneously the two languages, in what has been called code blending. (Emmorey et al. 2005 a.o.). In this talk, we shall show that while the dimension of word order is not affected by this simultaneous activation, morphology does not seem to be able to operate simultaneously in two different ways.
We shall focus on a population of 7 Italian CODAs: aged 5-9 and on their spontaneous blending production. LIS and Italian are particularly fitted for testing issues concerning the autonomy of grammars in mixing since they belong to typological extremes from at least two points of view: Italian is coherently head initial, while LIS is coherently head-final; Italian is a typical inflectional language while LIS displays the non linear agglutinative morphology attested in most sign languages.
For word order, we shall focus on one typology of code blending widely attested in our corpus, where two autonomous utterances are produced simultaneously, each displaying the word order prescribed by its language.
Such productions presuppose the free activation of two linearization strategies. Things are quite different from a morphological point of view: the most frequent pattern attested is one where only one morphological model is selected and imposed to both channels. Typically, the linear morphology is reduced to that of LIS (dropping in Italian most inflectional markers) and the relevant information is conveyed by non manual means.
The data on word order and on the linear morphology we shall present and discuss impose a selection among existing theories on the status of the components they refer to: the bimodal utterances displaying a different word order can be explained if we assume that word order is a late phenomenon due to phonological linearization algorithms and that the physical independence of the two channels in bimodality allow the activation of more than one of these algorithms (Donati & Branchini, in press). Data displaying the selection of only one morphological model impose a similar selection among existing theories of morphology: in particular, the fact that the availability of two independent articulatory channels does not allow the simultaneous activation of two morphological systems seems to go against current Distributed/Late Insertion models and calls for a more central (syntactic?) definition of morphological categories.

1. Introduction

The first aim of this talk is to address from the exceptional viewpoint of very peculiar data what is perhaps the core question concerning word order, namely its status in the architecture of grammar. From the very beginning of generative grammar there has always been an issue on whether word order is to be considered as part of syntax or as the byproduct of the process of linearization that reduces hierarchical abstract syntactic structures into strings of words. The classical Principles and Parameters head complement parameter (Travis 1984) was a clear representative of the former stand, defining word order as an important component of syntactic structures and assigning to typologically different languages with respect to word order specular different structures.

More recently, the direct insertion of ordering parameters into the syntax module has been seen as an unwanted redundancy given that word order is already an indispensable component of the phonetic interface, and most analyses reduce this dimension to the output of a linearization algorithm operating at the PF interface. Narrow syntax structures are seen as built through recursive applications of the operation Merge, which includes no information about order. But still, two positions

(at least) can be singled out from the point of view of the nature of such an algorithm and of its impact onto syntax.

On the one hand stands Kayne (1994) and others (see recently Biberauer at al. 2007 among many others), who posit a unique non parametrized algorithm able to filter out syntactic structures: the algorithm does indeed operate at the PF interface and is thus not syntactic *per se*, but structures that are not linearizable by such an algorithm are simply not generable. As a result, if two strings display two different linear orders, they necessarily display two different syntactic structures, one involving movement operations not included in the other.

On the other hand, we have a family of analyses that we might label rather conventionally as 'chomskyan', in which linearization is viewed as properly post-cyclic and post-syntactic (with no influence whatsoever on syntactic structures) and possibly subject to parameterization. Crucially, this implies that two strings displaying two divergent word orders might correspond to the same abstract syntactic structure, linearized by different settings of the linearization parameter(s).

We shall show that there is a set of data, very peculiar and exceptional but productive and clearly grammatical, which might shed light on this intricate question leading to interesting conclusions. The data this paper focuses on, all concern mixed utterances or, "code mixing". Code mixing is a very widespread and actually systematic feature of the production of any bilingual, and it can be usefully defined as "the juxtaposition within the same speech exchange of passages of speech belonging to two different grammatical systems or subsystems" (Romaine 1989). The strong productivity of mixed utterances in bilingual acquisition has been considered for a long time as the direct and clearest symptom of a substantial (con)fusion of the two grammars and lexicons in bilinguals' competence (Volterra and Taeschner 1978, Redlinger & Park 1980 a.o.). Recently the debate on the nature of this peculiar type of utterances has been radically revised. The hypothesis of a unique grammatical system has been definitely discarded and the separation of the two grammatical systems from the very beginning has been widely demonstrated (Genesee 1989; Genesee, Nicoladis & Paradis 1995; De Houwer 1990; Meisel 1989). The minimalist approach and its extension to the phenomenon of code mixing (Mc Swann 2001; 2005) advanced the hypothesis that a mixed utterance is simply an utterance generated through the selection of lexical items belonging to the two lexicons available to bilinguals: any mixing is thus possible insofar as the words that are selected are endowed with compatible syntactic and morpho-phonological features. What happens when an individual is competent in two languages is that he can access both in the same utterance. Clearly, it might be the case that the two languages involved in such a bilingual situation display different word orders. What seems to be at play in these cases is a kind of 'equivalence constraint' (Poplack 1980): as a tendency, code mixing will be avoided in all the syntactic areas where the two languages prescribe a different word order (see Chan 2003 and the references here cited for many counterexamples) suggesting that word order plays a role in computing utterances involving more than one language. We might want to find out whether these types of constraints imposing word order equivalence to mixing are constraints concerning the architecture of the language faculty or constraints due to linearization requirements. In order to find data more relevant for our word order concerns, we will focus on a specific population of bilinguals, so-called bimodals, and on its peculiar mixed utterances, so-called blendings (Emmorey et al. (2003)). Bimodals are bilingual individuals where the two languages involved belong to two different modalities: typically, the signed modality and the spoken one. The independence of the two channels employed by the two

languages virtually frees bimodals from the usual linearization requirements bilinguals undergo: we shall verify what happens to word order in these exceptional circumstances. The second part of the talk will be devoted to morphology: we shall show that the simultaneity typically displayed in bimodal blending surprisingly affects the morphological expression of the two channels.

1.1 The subjects

The experimental subjects are six hearing balanced bimodal children (CODAs: Children Of Deaf Adults) aged from 6 to 8 years, all native and fluent speakers of Italian and Italian Sign Language coming from the central regions of Italy.

1.2 Glossing conventions

We adopt the standard notational convention of representing LIS signs with capitalized English words. We follow the tradition in using the citation forms for the glosses translating signs for verbs. This, however, does not mean that LIS verbs lack agreement. In glossing code blendings, the spoken Italian utterance is transcribed above the signed string and it is always preceded and signaled by the abbreviation *it* while the utterance in Italian Sign Language is always signaled by the abbreviation *LIS*. We tried to reproduce the timing of the production of the two linguistic strings by writing co-occurring signs and words in column.

2. Some notes on LIS syntax

Italian Sign Language and Italian are two independent languages each endowed with its own grammar developed autonomously. The two languages differ in phonological, morphological and syntactic domains.
More interestingly for the purposes of the present paper, Italian and LIS belong to two typological extremes from the point of view of word order: while Italian is a coherently head-initial language, LIS is a coherently head-final language with the aspectual marker (DONE) (1), modals (2), negation (3), and *wh* elements (4) following the verb. Both are pro-drop languages where constituents dislocate rather freely for information-related purposes.

(1) MARY HOUSE BUY DONE
'Mary has bought a/the house'

(2) MARY HOUSE BUY CAN
'Mary can buy a/the house'

(3) MARY HOUSE BUY NOT
'Mary doesn't buy a/the house'

(4) MARIA BUY   WHAT
Mary   buy   what
'What does Mary buy?'

LIS does not mark tense on verbs but makes use of time adverbials occurring sentence-initially, as shown in (5).

(5) YESTERDAY MARY HOUSE BUY
'Mary has bought a/the house yesterday'

3. Blending Typologies and linearization solutions

In the first part of the talk we shall focus on those productions that appear to be more relevant for the issue of the status of word order, linearization and morphological selection. Let us begin with a descriptive typology of the kinds of mixing observable.

3.1 Code-switching

CODAs may switch from one language to the other interrupting signing to speak and vice versa. The two successive fragments follow the word order constraints of the corresponding language. However, in accordance with previous research, our corpus only provides a few of such cases, indirectly confirming that this typology of code mixing is not very popular among our young CODA population.

(6)　　it:　　　　　　　　e　poi　l'ha　　　preso
　　　　　　　　　　　　　and then it have-3sg take-past
　　　　LIS: CUT-HEART　　　　　　　　　TAKE-HEART
　　　　'(He) has cut the heart and has taken it'

3.2. Dominant blendings

A first typology of blended utterances attested in our corpus includes an autonomous and complete utterance in just one modality, supported by few words or signs in the other modality, which do not add any meaning to the global utterance.

(7)　　it: La　strega dà　　la　mela　a Biancaneve'
　　　　The witch give-3sg the apple　to Snowhite
　　　　LIS:　　　CL-GIVE
　　　　'The witch gives the apple to Snowhite'

3.3. Independent blendings

A second typology of blendings involves the simultaneous production of two independent and autonomous monolingual utterances. Interestingly enough, the two sentences may be slightly different. The utterance may be semantically richer in Italian, as in (8) or in LIS, as in (9).

(8)　　it: Lavora　a Rimini
　　　　work-3sg in Rimini
　　　　LIS: WORK HE THERE
　　　　'He works there, in Rimini'

(9)   it: I   sette nani   sono saliti
             The seven dwarves   be-pl climb-past
        LIS: SEVEN DWARVES CLIMB ON-SHOULDER
        'The seven dwarves have climbed on the sholulders'

A more interesting question that arises in relation to this typology of blendings concerns linearization: since we know the two languages follow different unmarked word orders, how does the fact that the two autonomous utterances are uttered simultaneously affect their linearization and the linearization of the global utterance? Three linearization solutions are attested in our corpus.

a. Congruent lexicalization

One possibility which is attested in our corpus of independent blendings is what we might call **congruent lexicalization** following the standard terminology: the two blended strings happen to display the same word order in the two languages according to their specific grammars, and there is therefore a complete and natural matching between the words and the signs produced simultaneously. An example is given in (10).

(10)   it: Lei   sa   tutto
              she   know-3sg   everything
        LIS: SHE KNOW   ALL
              'She knows everything'

Universal quantifiers are a documented exception to the strong OV order of LIS (Cf. Geraci 2006), and systematically follow the verb: as a result the two word orders naturally overlap in (10). This pattern, which relies on parallel structures in the two languages, is not in any way the most frequent pattern attested in this typology of blendings. We cannot thus claim that there is a sort of a *parallelism constraint* at play in blending, constraining mixing to occur only where the two languages overlap, *contra* what has been proposed by many in relation to (unimodal) codeswitching (see above §1).

b. Syntactic calques

A different option displayed by our bimodal subjects in relation to independent blendings is for the two utterances to follow the word order of one language. Both may follow Italian word order, as in (11), or LIS' word order, as in (12).

(11)   it: Una bambina va   allo   zoo
              A   girl   goes   to the zoo
        LIS: GIRL   GO   ZOO
              'A girl goes to the zoo'

 (12)   it: : Il   papà   la mamma la sorella mangiato finito
              The father the mother the sister   eaten   done
        LIS: FATHER,   MOTHER, SISTER EAT   DONE
        'The father, the mother and the sister have done eating'

c. Contradictory orders

A final possibility that is attested in our corpus of independent blendings, perhaps the most interesting one from the point of view of linearization, is that each of the two utterances follows the typical word order of its respective language. As a result, the two utterances are produced simultaneously but with a different and even contradictory word order. The example in (13) involves negation, which typically *follows* the verb in LIS, but *precedes* it in Italian, while in (14) a wh-question: the wh-element is regularly sitting in the left periphery in Italian, while it is at the right end of the clause in LIS.

(13)   it: Eh? Non ho   capito
             uh? not have.1sg   understand-past
        LIS: I UNDERSTAND NOT
        'Uh? I haven't understood'

(14)   it: Chi   ha   chiamato?
              who have.3sg   called
         LIS: CALL   WHO
         'Who called?'

3.4. Blended blendings

A final typology of blending attested in our corpus consists of a mixed utterance whose constituents are scattered in the two linguistic channels. Crucially, the utterance is complete and meaningful only if the scattered fragments produced in the two channels are put together in a unique, blended utterance. In (15) Italian provides the indirect object while LIS provides the subject and the verb is produced in both utterances. In (16) Italian provides the locative argument and LIS the verb.

(15)   it: Parla   con Biancaneve
              talks   with Snow white
         LIS: TALK   HUNTER
         'The hunter talks to Snow white'

(16)   It: Dalla regina   cattiva
               to the queen   wicked
         LIS: GO   WICKED
          '(He) goes to the wicked queen'

Crucially, in these examples, we systematically see pairs of constituents which are uttered in simultaneity and thus simply not linearized.
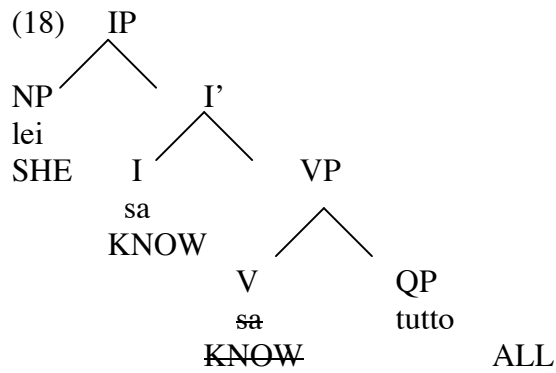
4. Some structural hypotheses and their consequences for the status of linearization in grammar

Let us now try to interpret these data at the light of the major hypotheses on word order and linearization outlined at the beginning of the paper, and to figure out what structure(s) underlie these different productions.

4.1. One word order

This typology is not particularly interesting: it corresponds to a monolingual utterance from the point of view of linearization, except that lexical insertion happens twice instead of only once. To illustrate, a case of congruent lexicalization like (10), repeated here as (17), might have a structural representation such as (18).

(17) it: Lei   sa   tutto
            she   knows   everything
      LIS: SHE KNOW   ALL
      'She knows everything'

(18)   IP
      /   \
    NP   I'
    lei   / \
    SHE   I   VP
          sa   / \
        KNOW V   QP
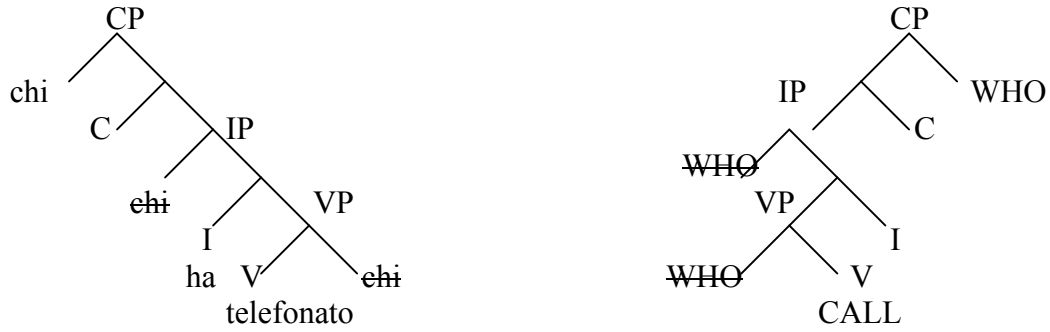   sa   tutto
            KNOW   ALL

4.2. Two word orders

The typology involving the contemporary production of two strings obeying two different word orders is indeed much more interesting, and the issue of what kind of structural representation underlies them is by far more relevant for our purposes. Consider again an instance of this typology, repeated below.

(19) it: Chi   ha telefonato
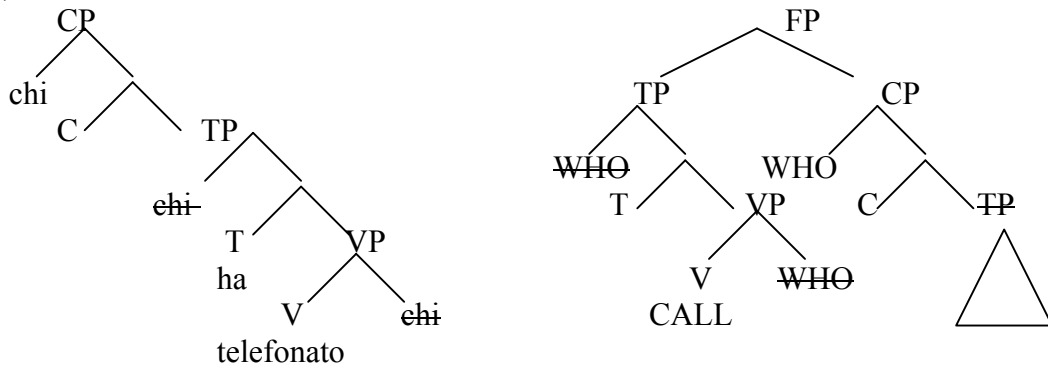   LIS: CALL   WHO
      'Who called?'

At least three structural hypotheses can be advanced to account for this piece of production according to the theory of word order one buys.
If order parameters are syntactic, two specular structures will have to be generated simultaneously: (20).

(20) two (basic) structures

```
        CP                                          CP
   chi /  \                                  IP  /     \  WHO
      /    \                                /  \       /
     C      IP                         WHO̶      \     C
    /      /  \                              \  VP \  /
  chi̶    /    \                               \ /  \ I
        /      VP                          WHO̶    \  /
       I       /  \                              \ V
      ha   V      chi̶                             CALL
         telefonato
```
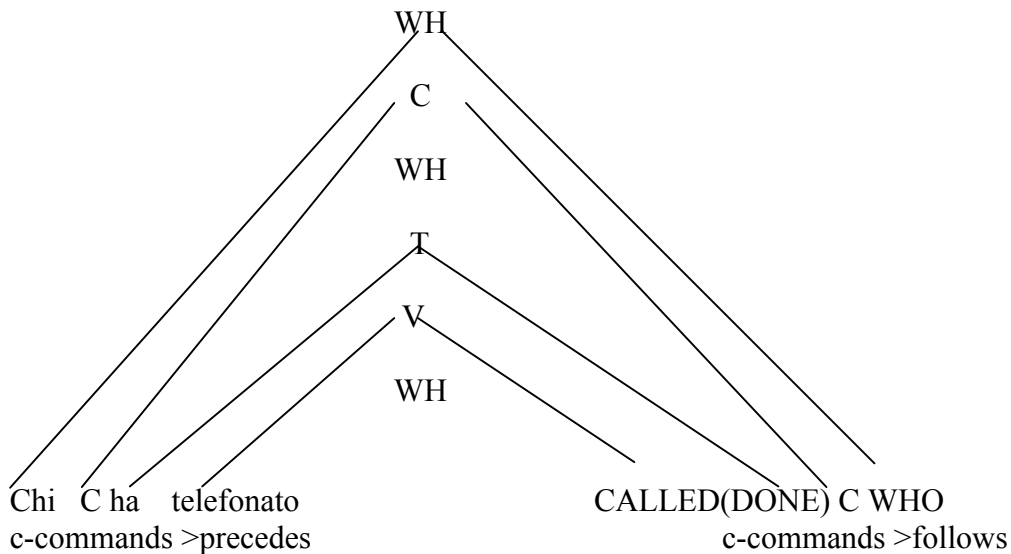
If word order differences are the result of different derivations given a unique linearization algorithm filtering out syntactic structures, two syntactic derivations will have to be computed in parallel: (21).

(21)   two derivations

```
        CP                                            FP
   chi /  \                                    TP  /     \  CP
      /    \                                 /   \      /   \
     C      TP                           WHO̶      \  WHO    \
    /      /  \                               T /  \      /  \
  chi̶    /    \                               /    VP   C    TP
        /      VP                                /  \  /     /\
       T       /  \                             V   WHO̶     /  \
      ha   V      chi̶                          CALL        /____\
         telefonato
```

If word order differences are the result of different PF linearizations, only one abstract syntactic structure will have to be generated, linearized twice: a tentative representation is provided in (22).

(22)   two linearizations (one structure/derivation)

```
                        WH
                          \
                       C   \
                            \
                       WH    \
                              \
                       T       \
                                \
                       V         \
                                  \
                       WH          \
                                    \
  Chi  C ha  telefonato        CALLED(DONE) C WHO
  c-commands >precedes          c-commands >follows
```

The crucial difference between the three hypotheses outlined above is that in the first two what the subjects do is generating two different syntactic structures (20) or derivations (21), while in the latter hypothesis only one (abstract) structure is generated and two PF representations activated (22).

How can we choose between these two basic stands? It seems to us that a possibility like (22) comes up quite naturally and directly from the availability of two channels and hence two PF's, while both (20) and (21) presuppose an extra ability of bimodals, that of computing online two syntactic structures at the same time. As a result, both (20) and (21) appear to predict contradictory orders to be more computationally challenging than what (22) does.

To check these predictions, we tried to elicit this typology with a specific formal experimental task.

An elicited imitation task

The rationale behind the choice of the elicited imitation methodology is the assumption that speakers will only successfully imitate sentences that are easily analyzable by their grammar, while avoiding imitating sentences that are difficult or ungrammatical (White 2003).

In this task, the children viewed short videos previously recorded by a bimodal interpreter and were asked to repeat what they had seen. Besides a number of distracters (monolingual sentences both in Italian and in LIS, grimaces and other typologies of blending) they were asked to imitate blendings with contradictory order, such as (23).

(23) it: Cosa ha mangiato?
           What has eaten?
     LIS: HE   EAT   WHAT
     'What has he eaten?'

Two of the three children who underwent the task, preserved the two divergent word orders in the overwhelming majority of stimuli (respectively 80% and 70% of the times). The results suggest that producing a contradictory order is something children are able to do quite naturally and with little trouble. This is what we might expect as the result of a lifelong training in the simultaneous activation of two PF channels, while if divergent syntaxes were involved in such productions we would expect them to be more difficult and computationally challenging.

Though there might be something intuitive in the above conclusion, we understand that its is not compelling in making us choose which theory of word order to opt for. We believe that a stronger conclusion can be reached reflecting on the last typology of linearization strategy: no word order.

4.3 (Virtually) no word order

The last typology of blendings we have observed is in fact extremely relevant for the issues being discussed here. Recall what happens in these cases: we have one and only one utterance, which is grammatical and semantically complete only through the integration of elements scattered in the two channels, which are systematically produced simultaneously. The simplest example occurring in our corpus is given in (24).

(24)   it: io!
                    I
        LIS: WIN
        'I won!'

In (24) we have a simple two-member clause, whose only two constituents, the subject and the verb, are uttered simultaneously: in this case we see a clear example of a sentence that is simply not linearized at all.

What the examples discussed above (§3. 4) clearly show is that the constituents do not need to be linearized in order to be integrated into a blended syntactic structure and compositionally interpreted.

If linearization is considered to be phonological, something that happens to syntactic structures to adapt them to the linear articulatory constraints usually attached to the sensory-motor interface, the existence of this typology of blending is straightforwardly predicted: due to the exceptional circumstances of the availability of two linear channels instead of one, these usual articulatory constraints can be partially suspended and linearization partially overridden. But if linearization is considered to play a more central role in relation to syntax, these data become extremely problematic. If word order is part of syntax, syntax simply generates ordered words and no exceptional articulatory circumstance might have any direct effect on this syntactic output: under this view, two syntactic constituents such as subject and object are configurationally distinct not only in terms of their abstract hierarchical position but also in terms of their linear occurrence, and having them linearly undistinguishable is simply not an option.

The same kind of conclusion applies also to the Kaynean stand: if linearization is a filter on syntactic structures you predict simultaneity to be impossible: syntax automatically generates linearized strings through the axiom translating asymmetric c-command into precedence; either an element c-commands another element, in which case it will precede it; or it is c-commanded by it, in which case it will follow. No other option is available since c-command is a total relation. No articulatory exceptional circumstance might affect this axiom in a clear way.

Concluding this section, what these data show, and (24) is particularly representative in its simplicity, is that word order cannot be a syntactic dimension, neither directly, as in the traditional Principles and Parameters approach, nor indirectly, as in the Kaynean Linear Correspondence Axiom.

5. Morphology

Surprisingly, the morphological realization of the syntactic features linearized as illustrated above appears to be heavily affected in simultaneous blendings. What seems to be at play is a restriction disallowing the simultaneous activation of two morphological types in the same speech act. I the corupus we will be presenting the most frequent pattern is one where only one morphological model is selected an extened to both channels. Typically, the linear morphology is reduced to that of LIS (dropping I Italian most inflectional endings) and the relevant information is conveyed by non-manual means. A tentative definition of such a restriction will be provided in the talk.

6. Conclusions

This paper deals with a very specific and peculiar set of data, the mixed utterances produced by hearing children competent bilinguals of two languages belonging to two modalities: Italian and Italian Sign Language. These data are here analyzed in the perspective of a sort of 'natural experiment' concerning the relation between grammar and articulatory constraints. It is a fact that code mixing, which has the shape of a temporal sequential alternation of two languages within the same utterance in unimodal bilingualism, happens to be overwhelmingly simultaneous in bimodal situations, in what is sometimes called blending. This means that the availability of two independent modalities and channels allow bimodals to access the two systems at the same time, and to thus dispose of an exceptional escape hatch from the usual linear articulatory constraints pressing speakers in normal situations. This paper examines the impact of such an exceptional articulatory freedom on word order and morphology. The strong conclusion we draw is that some linearization strategies observed in our corpus, such as the simultaneous activation of two divergent word orders (§3.3c) and especially the utterance of virtually non linearized blended sentences (§3.4), show that linearization is a late (phonological) phenomenon subject to parameterization and avoidable under exceptional circumstances such as the availability of two independent channels. On the other hand such a simultaneous activation of two divergent morphological types does not seem to be equally possible, calling for an explanation in terms of the architecture of grammar.

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