# On the regulatory processes which control the expression of linguistic chunks in Natural Languages.

Paloma Garcia-Bellido, Oxford University, UK.

Abstract

The focus of this paper is to suggest that the phenomenon of redundancy and its regulation is of major importance in order to understand the formation of timed sequences and their effects in communication.

Redundancy here refers to the emergence of an articulated element A' which bonds in the timed sequence and is isofunctional or synomymous to another articulated element A in the same sequence. A' may take an identical or different shape from that of A in the sequence. A' may produce effects of symmetry.

This discussion is centred around some examples taken from both the phonological and the syntactic levels of organisation: A' BA (French syntax: **ne'** rit **pas;** Spanish syntax**: no'** rie **nadie**), AA' (Spanish phonology: b**we'**no) and A' AB (French syntax: **ne' pas** rire; Spanish phonology: **g'w**ele).

It is claimed here, to my knowledge for the first time, that at least three factors regulate the articulation of redundancy. One factor is the orientation in which A is integrating with B. A particular order of the bonding of A with B in the sequence produces replication, A'BA, while the opposite orientation, AB, does not (Spanish syntax: **no'** rie **nadie A'B**A/ **nadie** rie AB). The second factor, called here compartment circuitry, represses the production of a replica of *A*, *A'*, in presence of *A*, only when another A is bonding to the same site B in the sequence: (Spanish syntax: AB, *A'* B*A*, AB*A* , but not the expected A*A'* B*A*).

It is suggested here - as analogy to properties of the visual system where one visually analysed object can produce two different perceptions - that in an internally cohesive compartment A'CBA, where CB forms an interval cluster to which A bonds, a third factor: focussing more or less intensely on BA, triggers the manufacturing of a non-articulated replica AC=*A'* BA. This virtual redundancy has the knock-on effect of making our perception to shift to the opposite meaning AC=A' BA within the same compartment. One linguistically analysed object, ACBA, is perceptually heterofunctional or ambiguous. When AC+BA forms a non-cohesive cluster, i.e. two compartments, modulating BA focus is precluded.

## 1. Introduction

One of the most important enterprises that, in my opinion, current research in linguistics needs to engage in the understanding of how linguistic sequences are formed in the brain.[1]

In the last forty years or so the most influential linguistic research programme has been assuming that linguistic sequences emerge from the existence of species-specific hierarchical structures or templates [2; 27] to which the sensory and motor systems adapt [10]. More precisely, according to this view, the key component of a species-specific Narrow Faculty of Language (FLN) is "a computational system (narrow syntax) that generates internal representations and maps them into the sensory-motor by the phonological system, and into the conceptual-intentional interface by the (formal) semantic system."[10; 1571].[2]

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[2] For a critical approach to the Conceptual-Intentional mapping see [18].

(1)     Broad Faculty of Language (LFB)

Sensory- Motor                                      Conceptual-Intentional
Phon.              FLN              Semant.
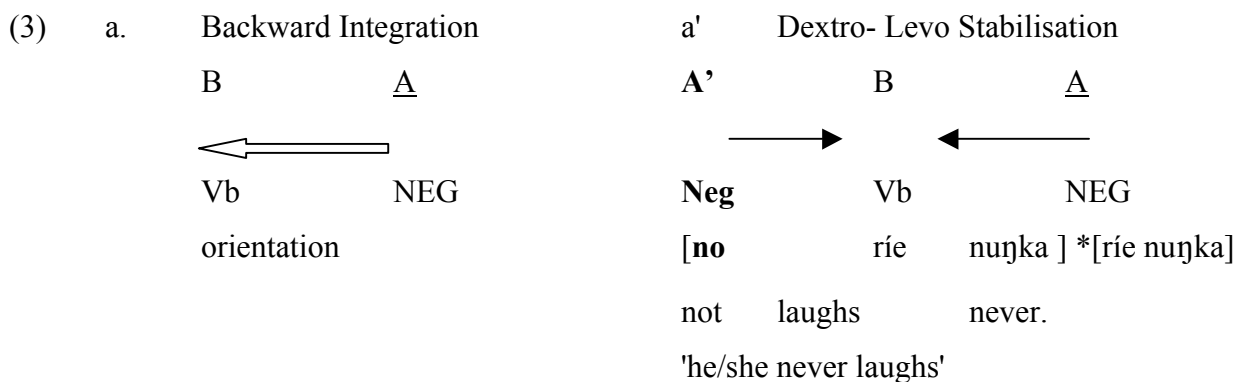
FLN (Narrow Faculty of Language)
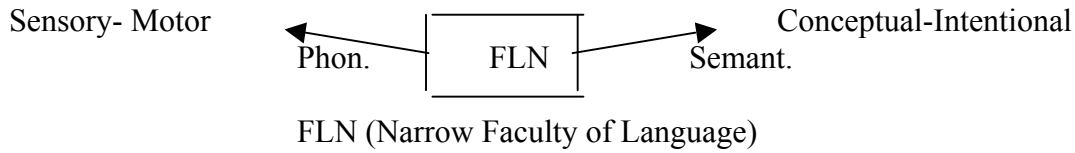
I will present empirical data taken from different languages, which suggest that the appearance of motorised expressions cannot be explained by the assumption that there are innate hierarchical representations in which these expressions adapt or fit in, by moving into recursively created niches (the movement hypothesis) [3 ; 184; 298].

(2)

Aj

tj

A= expression  t= no expression
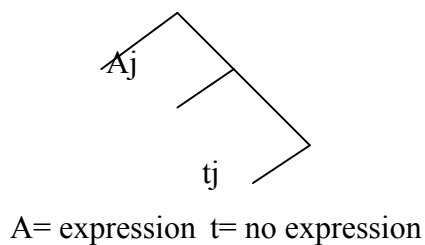
Movements, according to this hypothesis, are present with non-motorised marks represented with a trace t, as marked in (2). These traces are indexed with subscripts like j, as shown in (2), to keep track of which niches motor expressions come from.

It will be suggested instead here that there might be regulatory circuitries which control the activation and inhibition of motorised linguistic expressions. In particular, I will focus on describing how a regulatory circuitry might turn on and off the emergence of expressions such as [no] in (3) once an "orientation factor" is activated.

(3)     a.      Backward Integration                    a'       Dextro- Levo Stabilisation

        B              A                      A'             B              A

        ⟵                                    ⟶             ⟵

        Vb             NEG                    Neg            Vb             NEG

        orientation                          [no            ríe      nuŋka ] *[ríe nuŋka]

                                             not      laughs          never.

                                             'he/she never laughs'

The data comes from Spanish[3]. It is suggested that in this language backward orientation of only one negative expression (NEG), for instance [nuŋka] in (3) or [nadje] 'nobody' etc, with respect to a Verbal expression (Vb), for instance [ríe] in (3), turns on the production of a particle or "negative clitic" (Neg). I will classify this response as a morphosyntactic reaction[4]. A morphosyntactic response may occur if an orientation factor between NEG and the Vb is activated. I will call Backward orientation of NEG the integration of NEG with Vb in (3). If Neg is produced, it is integrated forwardly with Vb (Dextro stabilisation). If the phonology is turned on producing [no] this phonological sequence integrates in turn forwardly (Dextro stabilisation) with Vb. In Spanish, Element Clitics (Cl), like [te], can intervene between Neg and Vb [17] [no te ríes nuŋka] Neg Cl Vb NEG 'not you laugh never'. Crucially, in this language, if the same negative expression NEG integrates forwardly with the same verb Vb (4), a synonymous motorised sequence (4) emerges but this time without morphosyntax or phonolgy. The absence of morphosyntax might derive, it is suggested here, from the orientation factor of NEG. Forward integration might switch off morphosyntactic production and therefore phonological activation of a particle.

(4)      a.     Forward Integration        a'      Dextro Stabilisation

         A              B                  A              B

             ⟹                                ⟶

         NEG            Vb                 [nuŋka        rie]      *[nuŋka no ríe]

                                           NEG           Vb

             orientation                   never         laughs

                                           'he/she never laughs'
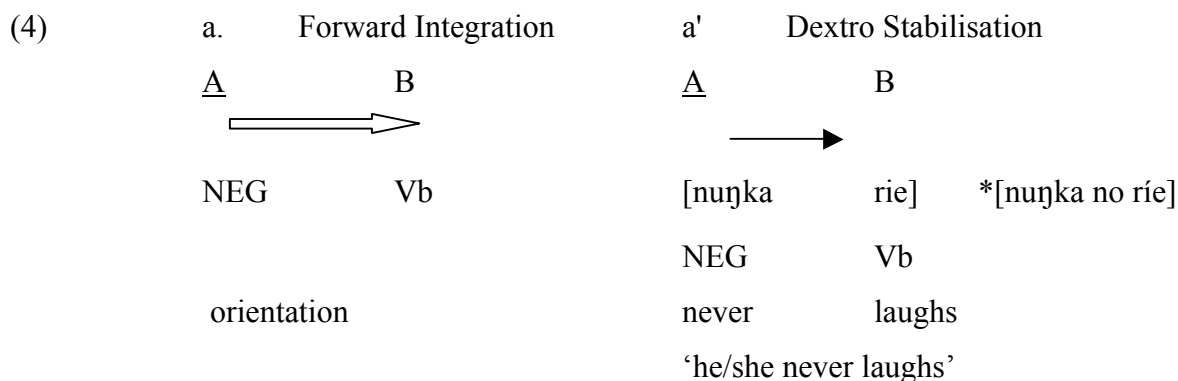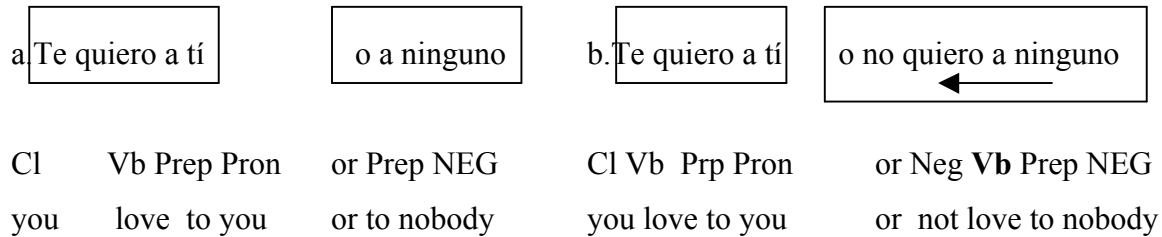
The following empirical data show that Morphosyntactic production cannot be switched on if the Phonology of the Vb is not switched on. This cause and effect interaction at different levels of integration is shown by the example taken from [17; 2573 (28e)] and given in (5):

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[3] For an extensive discussion and bibliography on Spanish negation see [1] [17].

[4] A "syntactic unit" is recognised in the selective combinatorial approach followed here [8], by a test: if a chunk can occur on its own in an utterance, then it is stressed and is a syntactic unit; if it cannot, then it is not a syntactic unit: i.e. in *tu te ries* (you you laugh), [tú] is a syntactic unit because it can be alone in the utterance. A morphological unit does not respond to the test as a syntactic unit and additionally has a fixed order, always after the Vb root: i.e [s] in *tu te ries*. Entity Clitics (Cl) [te] in Spanish bond next to the Vb and behave neither as syntactic nor as morphological units: i.e, [te] can be preceding the Vb in *tu te ries* and following it in: *al reirte* (upon to laugh you). I classify Cls as Morphosyntactic units. Because Cls can intervene between Neg and Vb i.e. *tu no te ries nunca* (you not you laugh never), then Neg is classified

(5)

| a. Te quiero a tí | o a ninguno | b. Te quiero a tí | o no quiero a ninguno |

Cl      Vb Prep Pron    or Prep NEG      Cl Vb  Prp Pron      or Neg **Vb** Prep NEG

you     love  to you    or to nobody      you love to you      or  not love to nobody

'Either I love you or else I love nobody'

Disjunction constructions like (5) create two separate compartments and isolate NEG from the Verb of the other compartment. Only if the phonology of the Vb is switched on is the NEG regulatory circuitry turned on, and only if the regulatory circuitry is on is the morphosyntax turned on, and only if the morphosyntax is turned on can the phonology be turned on and stabilise with the phonologically expressed Vb (5b). If the phonology of the Vb is not switched on in the right compartment (5a) then the Orientation factor between NEG and Vb cannot be switched on either.

This example suggests that phonology is necessary and sufficient to start a linguistic circuitry which in turn starts other levels of organisation. If this is correct then these empirical data would be a counter-example to the current assumption defended in [10] that narrow syntax (2) is the necessary start for Phonological motorisation. Here the contrary is true. The activation of the phonology of the Vb is what triggers the selection of NEG orientation which in turn triggers the formation of a chunk, which is non-adjacent to NEG, in the sequence.

( 6)     Inter-level circuitry in one compartment

Phon.                        Synt (orientation selection)

Ms

                                          (orientation selection)
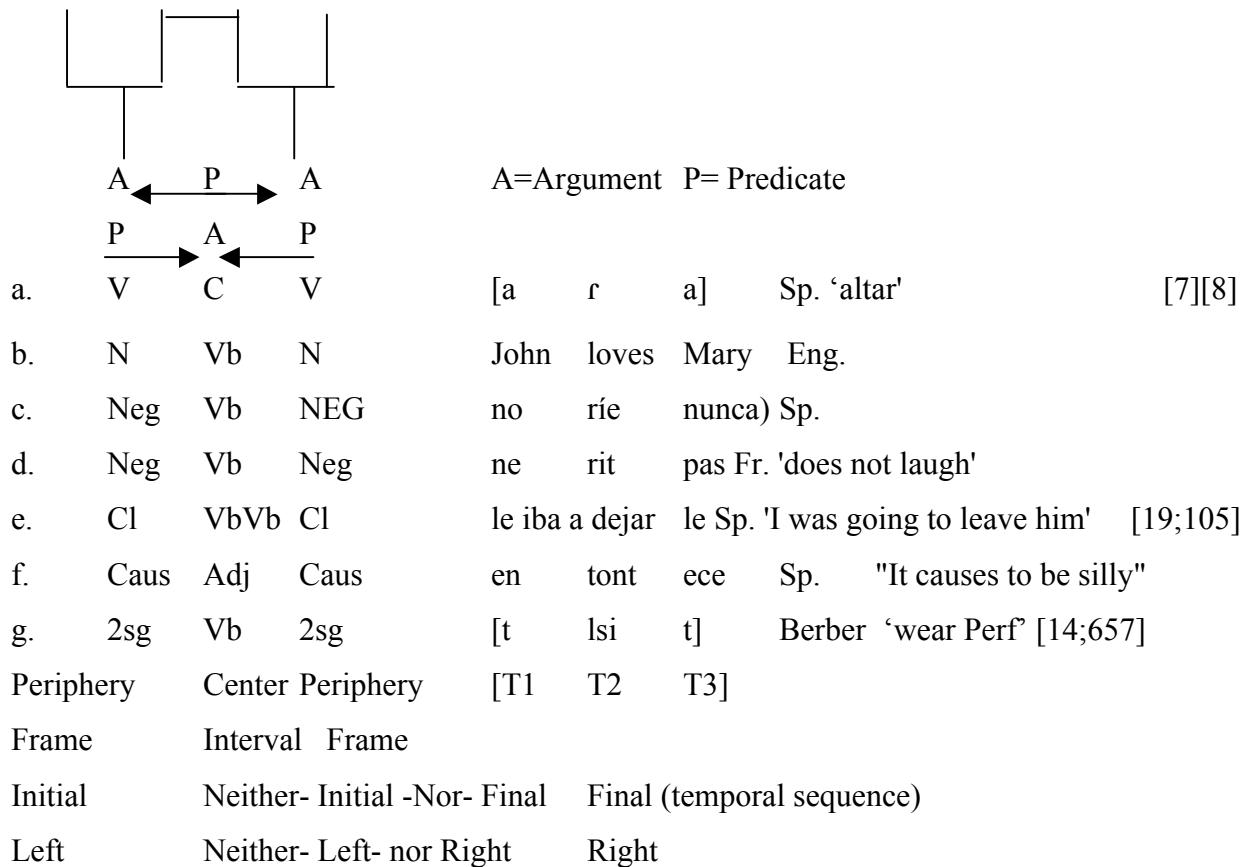
Phon
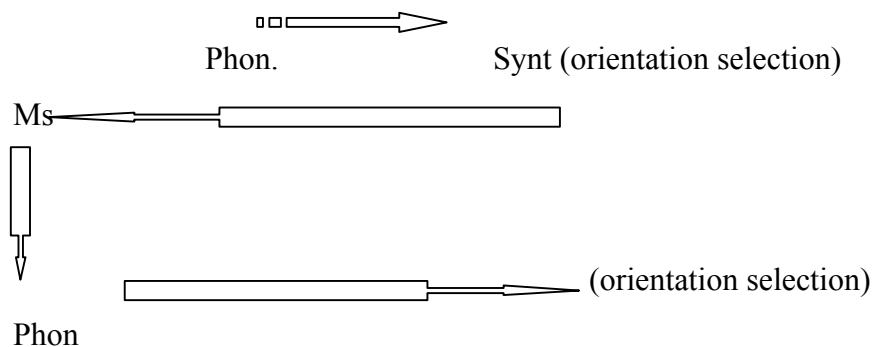
On the other hand, the redundant Neg response in the Levo stabilisation of NEG, as exemplified in (3a'), appears to be, in my opinion, a very natural perception of the brain if we evaluate this NEG stabilisation from a sensory dimension rather than from a binary computing event. The sequence in (3a') has a clear property of symmetry found as well in synaesthetic resolution [9]. A symmetric

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here as Morphosyntactic but it could as well be defined as a morphological unit because its position with respect to the verb is fixed. Neither Cls nor Negs do behave like syntactic units.

sequence has a centre, which functions like an interval, and one periphery expressed as a wrapping frame (7) [21; Ch 23].

(7)     Oral and visual Interval stabilisation

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        ┌─┐   ┌───────┐   ┌─┐
        │ │   │       │   │ │
        │ └───┘   ┌───┘   │ │
        │         │       │ │
        A    P    A            A=Argument  P= Predicate
       ←──────────→
        P    A    P
       ──────────←
```

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| a. | V | C | V | [a | ɾ | a] | Sp. 'altar' | [7][8] |
| b. | N | Vb | N | John | loves | Mary | Eng. | |
| c. | Neg | Vb | NEG | no | ríe | nunca) | Sp. | |
| d. | Neg | Vb | Neg | ne | rit | pas | Fr. 'does not laugh' | |
| e. | Cl | VbVb | Cl | le iba a dejar | | le | Sp. 'I was going to leave him' | [19;105] |
| f. | Caus | Adj | Caus | en | tont | ece | Sp. "It causes to be silly" | |
| g. | 2sg | Vb | 2sg | [t | lsi | t] | Berber 'wear Perf' | [14;657] |

Periphery    Center Periphery    [T1    T2    T3]
Frame        Interval  Frame
Initial      Neither- Initial -Nor- Final    Final (temporal sequence)
Left         Neither- Left- nor Right    Right

Symmetry as (7) (see Figs. 1,2,3) is found at all levels of linguistic organisation in Spanish and in all languages. These linguistic sequences are called in linguistic morphology non-concatenative or parasynthetic formations (7f) [20, ch5]. I mention some in (7). Paradoxically, only morphologists have acknowledged this formation and given it a name. In the realm of phonology it has been treated as binary in order to adapt it to a generative binary processing (7a). This has been proved to be flawed [7]. In Syntax, (7 b,c,d,e), no acknowledgment of its existence has been proclaimed since "the" given initial order is contingent on immediate disorder once movement starts switching expressions around [8]. Equally, sequential replication is considered in syntax to be unimportant compared to the attractive production of empty niches by movement.

The visual representation in (7) attempts to convey the meaning of a bottle with one glass at each side (Fig.1). This percept can be broken into neither a meaningful binary percept (glass+ a bottle), nor a meaningful (bottle+ a glass). On the other hand, the bottle emerges if the glasses are wrapping it, and glasses emerge if the bottle is an interval in the wrapping.

In terms of a motorised perception, there is a motor unit [T1 T2 T3], which contains a motor interval T2 preceded and followed by one motor periphery: initial T1-final T3.

A hierachical representation as in (2) precludes any prediction on the emergence of symmetrical perceptions such as (3a') or (7) since it is a computational operation which uses exclusively binary sequencing through the analysis of only two nodes at a time in a representation. Based on the failure of capturing natural percepts with two dimensional representations, it is suggested in [8] and here that a general theory of perceptual integration may ultimately explain how linguistic symmetry, as appearing in (3a') and (7), is formed in the brain.

(8)

Sensory ⟶ Integrative ⟶ Motor

Following on this paradigm-shift line of reasoning, it is suggested here that a linguistic integrative system might be using general bonding mechanisms needed for all sensory elements to be integrated as perceptions, including the integrative system of synaesthesia which does not trigger a motor sequence (8). The motorisation of these bonded perceptions emerging as linguistic sequences, might just be the empirical evidence needed to acknowledge the existence of perceptual integration.

The discussion which follows will use a combinatorial hypothesis (The Selective Combinatorial Hypothesis) [6],[7],[8], which attempts to answer the question of whether linguistic sequencing derives from the activation of general perceptual regulatory mechanisms whose function is to integrate sensory activation [6],[7],[8],[9],[15], or whether it derives from species-specific novel mechanisms [2][3][10][11][14][15][20].


## 2. The emergence of motorised chunks

I will give here some examples of how an interval can emerge motorised or disappear (Spanish phonology), and others of how chunks of periphery can emerge motorised (Spanish phonology, French morphosyntax and Spanish morphosyntax).


### 2.1. The Orientation factor; Forward integration triggers the fabrication of a frame.

In Spanish phonology the simultaneous integration of stress with a Vocoid ($V$) turns on a Forward orientation factor. The $V$ stabilises in (9) as a Neither-Initial-Nor-Final Glide (G) [8]. Forward

integration of the **V** is stabilised thanks to the replication of a Vocoid and its formation as a Vowel (V) to which G can bond. This V is represented inside a box in (9).[5]

(9)     GV/V alternations

   a.     [pe]dicura     "pedicure"          b.     [bo]ndad     "goodness"

          [pjé]          "foot"                     [bwé]no     "good"

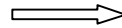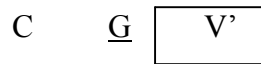   c.Simul. Integration                      Interval stabilisation

   ***Stress***                                          Stress

                                                            ↓

                                             C     G̲   | V' |

                ⇓                                      ⇒

                                             ←——————→

   ***V***

   ***palatal***                              [p     j     é]

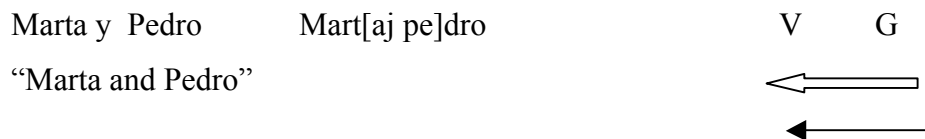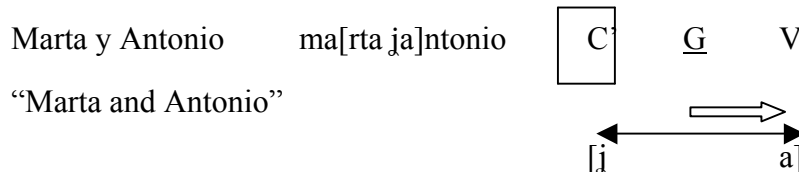   ***back***                                 [b     w     é] no

When stress does not combine with **V**, the response is to form a back Vowel [o], as shown in (9b), or a neither back, nor palatal, nor low Vowel [e] (9a).

However, in this language, if the Voiced-Palatal (V-P) **V** selects a Backward integration, then the stabilisation does not resolve with a motor interval. This contrast can be seen with the effects of the Spanish coordination 'and' .

   (10)   a.     Non-simultaneous Backward Integration and Levo Stabilisation

          Marta y  Pedro          Mart[aj pe]dro                    V     G

          "Marta and Pedro"                                     ⇐

                                                                ←——————


   (10)   b.     Non-simultaneous Forward Integration and  Interval Stabilisation.

          Marta y Antonio     ma[rta ja]ntonio     | C' |   G̲   V

          "Marta and Antonio"                                ⇒

                                                   ←——————

                                                   [j              a]

The orientation factor of the Voiced-Palatality **V** in (10b), when integrating forwardly with V, switches ON the fabrication of a replicated V-P consonant when there is no consonant in the environment to use

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[5]  For a discussion of this process in a non-linear approach see [5]. This diphthongisation process is regulated by memory, i.e. the Vocoid must be associated with a particular set of Spanish morphemes.

as a frame. However, Spanish independently activates a dissimilatory reaction when a V-P in an interval stabilisation encounters V -P in the periphery (11a,b) [6].

(11)  a  Regulation of Voiced-Palatality sequencing

V-P ON ⟵ V-P? ⟹ V-P ON

         3                    2
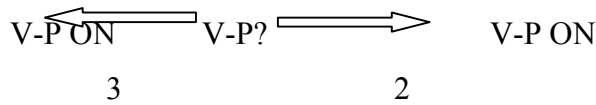
            If V-P is ON in EITHER  3 OR 2,   THEN  the  motor interval V-P? is turned OFF.

This dissimilatory response, which is known as Voiced-Palatal Simplification [6], switches off the motor expression of the interval (10b).

It seems that the simultaneous integration of Stress and *V* in this language (9c) triggers the formation of the right part of a peripheral perception, the box in (9), and it seems that the selection of a forward integration by coordination (10b) triggers the formation of the left part of a peripheral perception, the box in (10b), while at the same time the Voiced-Palatality regulator (11a) turns the formation of a motor interval off (10b).

The evidence that just one simultaneous integration may create both chunks of a periphery comes from the same language.

(11)  b. C/V alternation

hervir          [e ɹ βíɹ ]          hierve [j̯ é]rve          [o]ler          [gwé]le

" to boil'                              " it  boils"          "to smell'     'it smells"

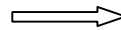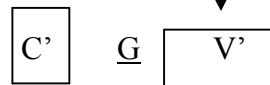Simul. Integration                  Forward integration and Interval Stabilisation

**Stress**                                      Stress

                                                    ↓

                                         | C' |  G  | V' |

     ⇓                                           ⟹

                                         ⟵⟶

*V*

*palatal*                              [j̯          é] rve

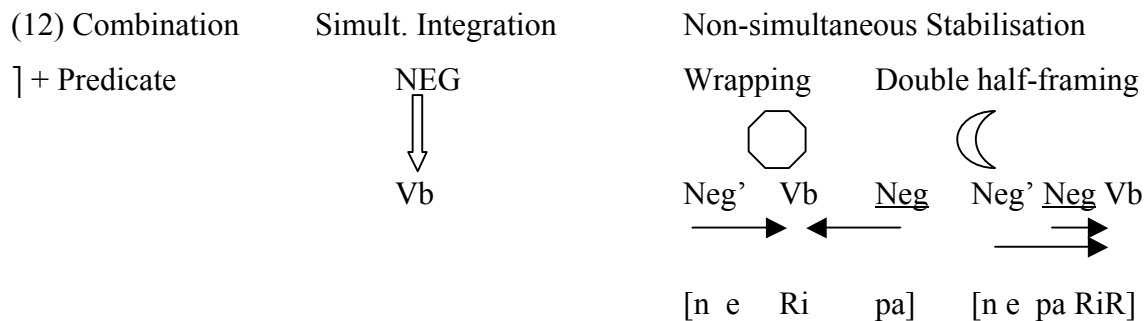*Back*                                 [g     w     é]lo

When stress integrates simultaneously with a Vocoid which happens not to be backwardly framed by a Consonant in the syntactic unit (11b), a Forward Integration is turned on with the consequent fabrication of a Vowel. The Vocoid triggers an Interval stabilisation with the fabrication of a Voiced-Palatal or Back Consonant to form the left periphery of an interval. The dissimilatory process (11a)
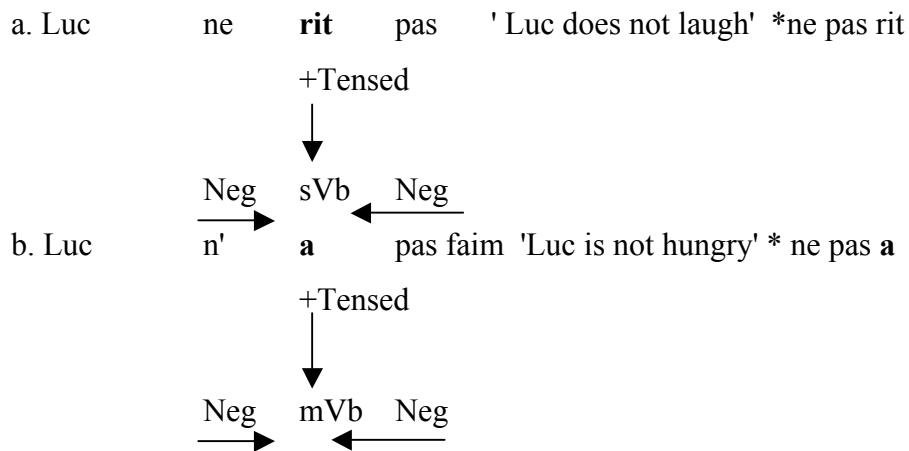
which regulates the production of adjacent V-P turns off the Vocoid but not the forward integration and interval stabilisation which is established between the expressions in the periphery *[é j̢]rve.

## 2.2. Non-simultaneous integration triggers the fabrication of morphosyntactic frames
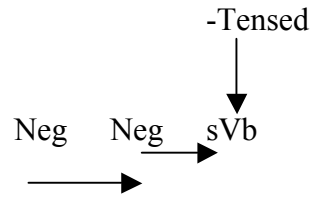
In French [15] [11], there are two different forms of expressing the negation of a predicate. When Negation (⌐) combines with a Predicate, it integrates simultaneously with the Vb, but stabilises switching on the morphosyntax (Neg). The Morphosyntax responds in this language with a one (Neg) or with a replication of a negative clitic (Neg' Neg) which either wraps the Vb (wrapping frame: Levo and Dextro stabilisation) or integrates only forwardly with the Vb (double half-framing Levo Levo stabilisation) switching on the Phonology [n] [pa] (12). [6] In (13) there is a description of the two selective factors: tensed / non tensed and morphosyntax (mVb)/ syntactic (sVb) which interact to make the choice between wrapping or double half-framing.

(12) Combination        Simult. Integration        Non-simultaneous Stabilisation

⌐ + Predicate           NEG                        Wrapping        Double half-framing

                        ⇓                          ⬡               ☾

                        Vb                         Neg'  Vb     Neg    Neg' Neg Vb

                                                   ⟶    ⟵              ⟹

                                                   [n e   Ri    pa]   [n e  pa RiR]

(13)    A .Syntactic and morphosyntactic Vb when tensed, form a wrapping (13 A.a,b)

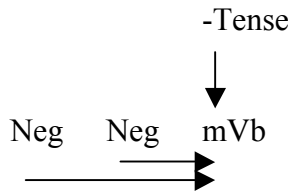        Syntactic Vb when not tensed, forms a double half-framing (13 A,c)

            a. Luc          ne      **rit**      pas       ' Luc does not laugh'  *ne pas rit

                            +Tensed

                            ↓

                    Neg    sVb    Neg
            b. Luc          n'      **a**        pas faim  'Luc is not hungry' * ne pas **a**
                    ⟶              ⟵

                            +Tensed

                            ↓

                    Neg    mVb    Neg
                    ⟶              ⟵

(13)        c. Luc voudrait ne     pas     **rire**     " Luc would like not to laugh"* ne **rire** pas

                                                -Tensed

                                                   ↓

                          Neg     Neg    sVb
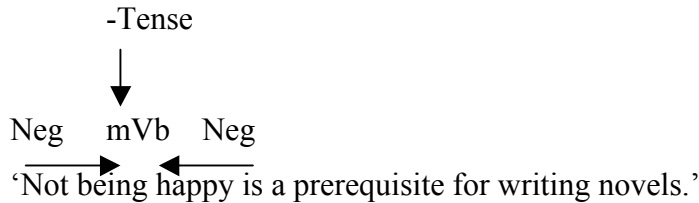
                          ⟶

(13)    B. mVb when not tensed, forms either a wraping (13B.b) or a double framing (13 B.a).

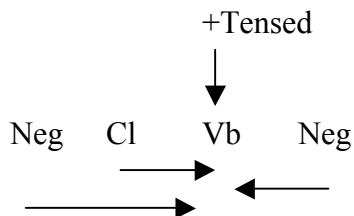                a.     Ne     pas     **être** heurex est une condition pour écrire des romans.

                                      -Tense

                                         ↓

                          Neg     Neg     mVb

                          ⟶

(13)        b.     N' **être** pas heurex est une condition pour écrire des romans.

                          -Tense

                             ↓

                  Neg     mVb     Neg
                  ⟶            ⟵
                  'Not being happy is a prerequisite for writing novels.'
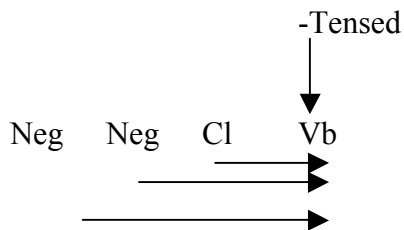
When Clitics are integrated in French, they bond next to Vb and the Negs then double half-frame or wrap the Vb with the Cls [11].

        (13) C.     a. Luc  ne     le     voit     pas     'Luc does not see it' *ne pas le vois

                    b.Ne pas l'avoir vut est difficile ' Not having seen it is dificult'

                                +Tensed

                                   ↓

                  Neg     Cl     Vb     Neg
                         ⟶    ⟵
                  ⟶

        (13)    C.     c. Ne pas le voir est difficile          'Not to see is difficult' *nelevoirpas

                                      -Tensed

                                         ↓

                  Neg     Neg     Cl     Vb
                                  ⟶
                  ⟶

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[6] Spanish has a morphosyntactic doublet as French in <u>aún</u> no'> 'not yet': *aún no ries* (double half-framing) *no ries aún* (wrapping framing). This doublet is not made out of two syntactic units since in an answer they come together: *Te ries?* 'do you laugh?' *--Aún no* 'not yet'.

# 3. Regulatory circuitry:  The control of Ms production

I will here draw attention at a breakthrough in the understanding of biological behaviour. In [13; 99-100] it is reported that the eating habits of the bacterium *Escherichia coli*, studied by Jacques Monod and François Jacob [12], demonstrates that in this organism the E.Coli responds to the environment. If it detects glucose in the environment it does not bother to switch on a gene which makes enzymes to break down lactose but switches on instead a gene which creates enzymes to digest glucose. However, if it detects that there is no glucose and there is lactose, the regulatory system of the organism immediately  switches on the gene which produces copies of enzymes that facilitate the breakdown of lactose.

(14)    a        Inhibitory effect of Gene 3 on Gene2

Detected       3        Glucose

Regulatory system     If  3 ON

Then  2 OFF

Lactose                 2              Detected
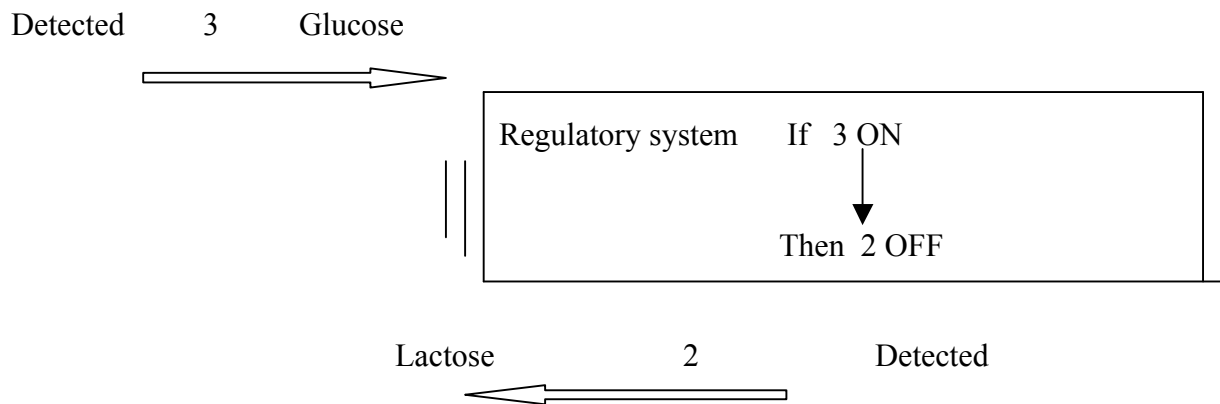
On the other hand, if Gene 3 is not needed and is OFF because there is no detection of glucose, Gene 2 is free to fabricate enzymes.

(14)    b.        The inhibitory effect of Gene 3 on  Gene 2

| Regulatory system | If | 3 | OFF |
|---|---|---|---|
|  | Then | 2 | ON |

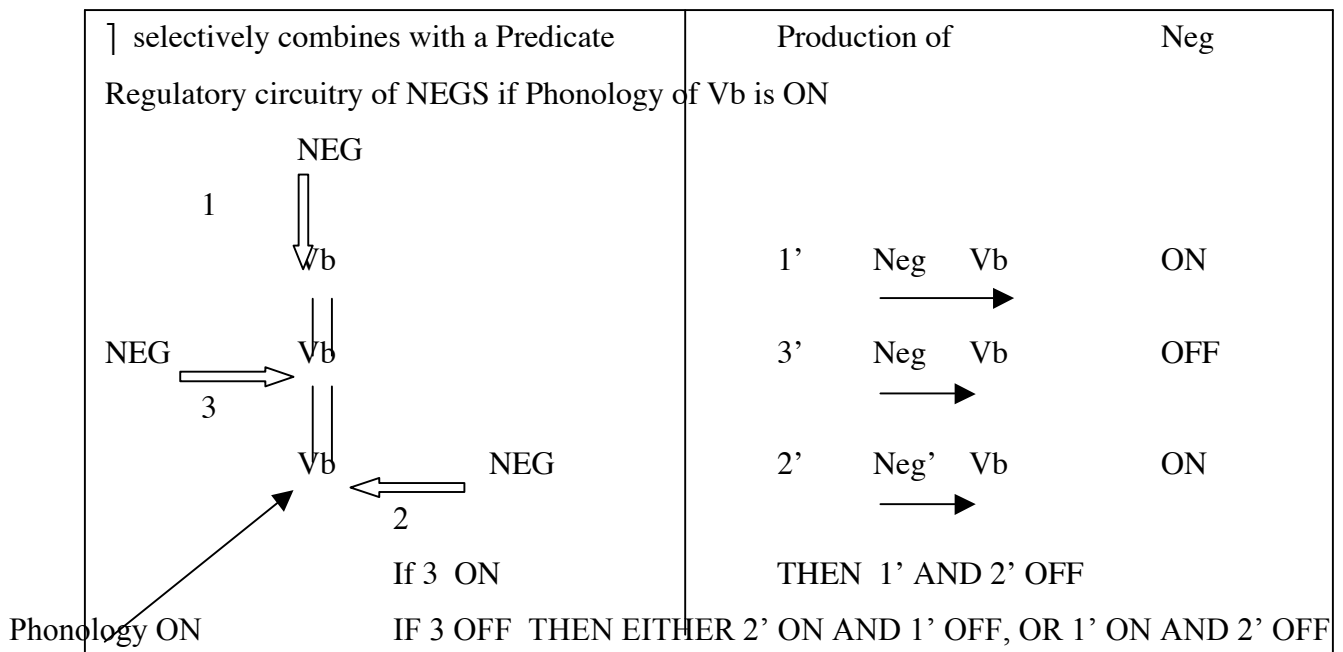Lactose                 2              Detected
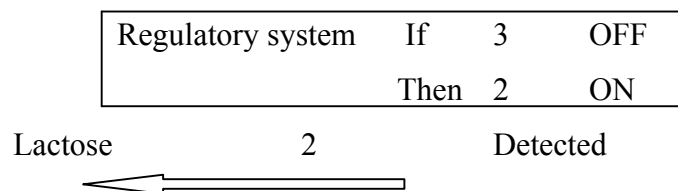
It is suggested here that this basic type of regulation is analogically found in the control of the production of Morphosyntax when there is a detection of motorised phonology and there is an activation of the orientation factor with NEG. There seem to be three different detections which need to be controlled. I will call this control a compartment circuitry. Observe the  Spanish data given in (15).

(15)    a.        no    ríe                    "He/she does not laugh"

Neg'  Vb                    not laughs

1

b.  Nunca  ríe                          "he/she never laughs"

    NEG   Vb                            never laughs
    ———————▶
        3

c.  no      ríe      nunca              "he/she never laughs"

    Neg'   Vb      NEG                   not laughs never
    ————————▶  ◀————
                    2

d.  nadie  ríe    nunca                 "nobody ever laughs"
    ——————————▶  ◀————
    NEG   Vb     NEG                     nobody laughs never

     3            2

The first thing to observe is that just when there is no NEG preceding the Vb, the Ms (Neg') is switched ON producing the particle Neg (15 a, c). The second thing to observe is that just when NEG is preceding the Vb, the Ms is switched of (15 b,d). The NEG-Vb seems to have an inhibitory effect on the production of Ms. The third thing to observe is that even though there is no NEG in the sequence there is a production of Ms (15a). The detection of a motorised Vb in a ⌉ + Predicate combination may switch a simultaneous integration which turns NEG 1 on with the Ms 1' (15a). This detection and reaction is called here 1. The non-simultaneous detection of Vb and of NEG, as forwardly orienting, switches ON 3 but switches off 3' and inhibits 2' (15d). The non-simultaneous detection of Vb and of NEG, as backwardly orienting, switches on 2' (15c). This can be summarised as in (15')

(15') Compartment circuitry of ⌉ to regulate Ms Neg for NEG1, NEG2 and NEG3

| ⌉ selectively combines with a Predicate | Production of | | Neg |
|---|---|---|---|
| Regulatory circuitry of NEGS if Phonology of Vb is ON | | | |
| NEG | | | |
| 1 ⇓ | | | |
| Vb | 1'  Neg ——▶ Vb | | ON |
| NEG ⇒ Vb | 3'  Neg —▶ Vb | | OFF |
| 3 | | | |
| Vb ⇐ NEG | 2'  Neg' —▶ Vb | | ON |
| 2 | | | |
| If 3  ON | THEN  1' AND 2' OFF | | |
| Phonology ON    IF 3 OFF  THEN EITHER 2' ON AND 1' OFF, OR 1' ON AND 2' OFF | | | |

Now observe the following data from the same language.

(16)     a. **No** conozco a un periodista que haya cometido un delito.

          'I do not know a journalist who may have committed a crime'

          b. No conozco a **ningún** periodista que haya cometido un delito

          'I do not know any journalist who may have committed a crime'

Here synonymity is maintained by using two different strategies. In (16a) 1' is switched ON as in (15a) above. In (16b) 2' is switched ON triggered by the presence of NEG following the Vb. EITHER 2' 0R 1' can be turned ON because 3 if OFF. This can be represented as in (17).

(17) IF 2 ON THEN 1 OFF  in the Regulatory compartment circuitry of Spanish ⌐ -Vb
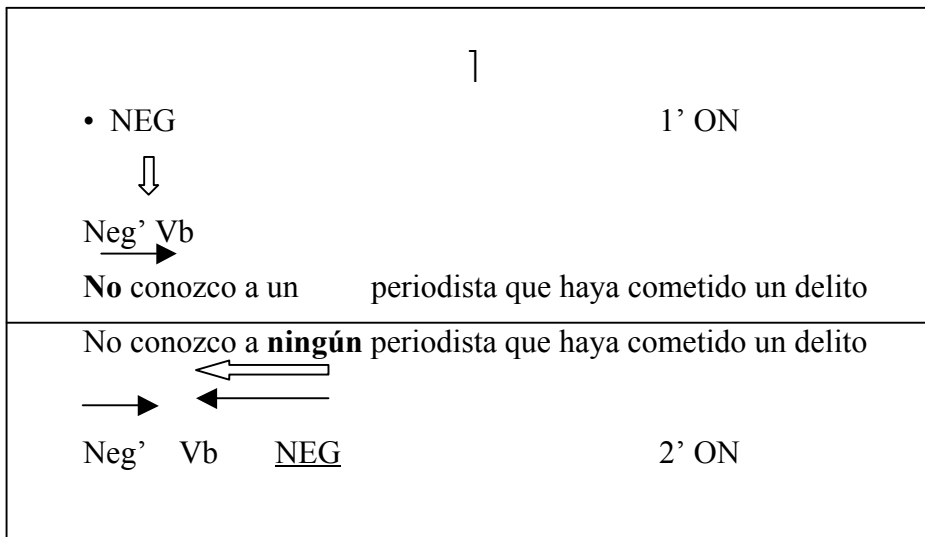


The propositions in (16a,b) are both true in a world where there is only one person (the speaker) who is neither a journalist nor a criminal and false if there are no people at all in the same world.

If 3 is ON with the LEFT Vb, (16c) below, the meaning that there is no journalist is still True regardless of whether by using "nobody" we add the suggestion that at least one more individual apart from the speaker does not know any journalist.

(16)     c.**Nadie** conoce          a un/**ningún** periodista que haya cometido un delito

          NEG          Vb          NEG

          'Nobody knows any journalist who may have committed a crime.'
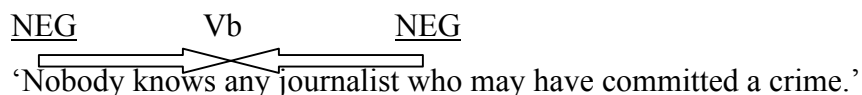
Now observe that, to maintain the effect of (16) in Spanish, the regulatory circuitry (15') has to be controlled preventing both switches of 1' and 2' to turn ON with the RIGHT Vb which is phonologically ON. If the production of Ms is not controlled in the second Vb then we change the sequence to (18), meaning (20). This suggests that either there is interconnectivity or cohesion between two mutually informed Vbs in (16) making the left Vb dominant for expressing the compartment negation, or else that the right Vb is segregated and independent out of the compartment [4;113-138].

(18)    a.    **No** conozco a un periodista que **no** haya cometido un delito

Neg' Vb →                          Neg' Vb →

'I do not know a journalist that may have not committed any crime'

   b.    No conozco a **ningún** periodista que no haya cometido **ningún** delito

Neg'  Vb    NEG ←                Neg'  Vb    NEG ←

'I do not know a/any journalist that may have committed no crime'

   c.    **Nadie** conoce a un periodista que    **no** haya cometido un delito

NEG  Vb →                          Neg'  Vb

NEG ↑

'nobody knows a journalist who may not have committed a crime'

While in (16 a,b) the propositions are true if there is only one person in the world (the speaker), in (18 a,b) the propositions are false if there is only one person in the same world, since the speaker is saying with (18 a,b) that there are at least two in the same world (the speaker and at least one journalist). In (16) a journalist does not have to exist, while in (18) a journalist must exist. (19) shows that in the same language NEG cannot be turned on with the Right Vb (19) if the Neg circuitry is ON with the Left Vb.

(19)    a.***Nadie** conoce          a un periodista que haya cometido **ningún** delito

   b.*No' conozco          a un periodista que haya cometido **ningún** delito

   c. * No' conozco          a **ningún** periodista que haya cometido **ningún** delito

NEG/Neg'    Vb                    NEG        Vb            NEG

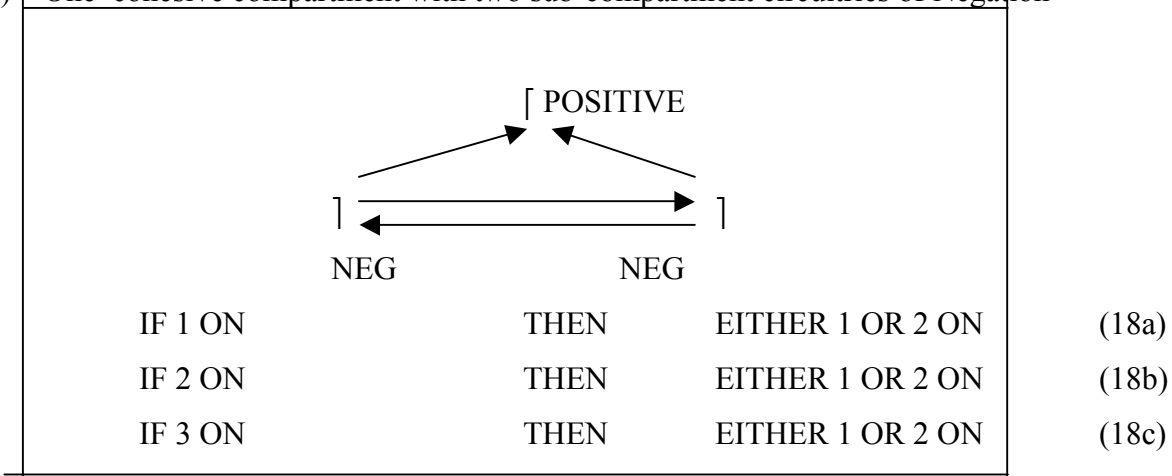→                    ←                    ←

The empirical data in (16), and (19) may suggest that there might be one cohesive compartment with only one Negation and one NEG compartment Circuitry activated with the phonology of the LEFT Vb (19'). This correlates with the meaning that there is no known journalist.

(19')

|  | NEGATIVE |  |
| --- | --- | --- |
| NEG ↗ |  | (16a,b,c) |
| Vb |  | Vb |
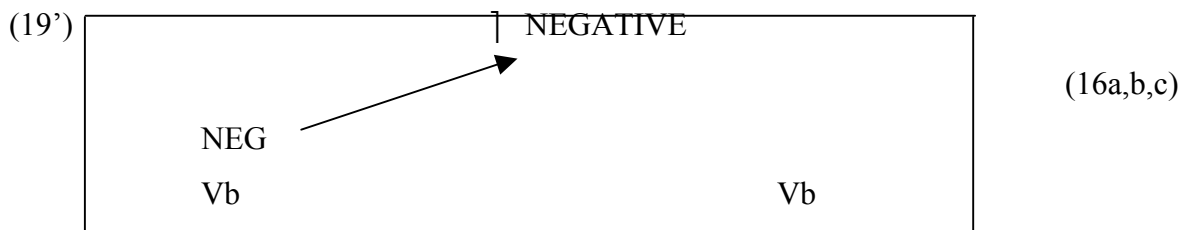
If this approach is corrrect then the one compartment hypothesis would explain not only why one circuitry can be ON out of two Vbs, but also why two sub-circuitries of negation cancel each other out

in the one compartment producing the meaning that there is one journalist which is known by the speaker (20). The meaning produced by one negation circuitry is the contrary meaning produced by two negation sub-circuitries or none in the same cohesive compartment.

(20') One cohesive compartment with two sub-compartment circuitries of Negation

⌈ POSITIVE

NEG          NEG

| IF 1 ON | THEN | EITHER 1 OR 2 ON | (18a) |
| IF 2 ON | THEN | EITHER 1 OR 2 ON | (18b) |
| IF 3 ON | THEN | EITHER 1 OR 2 ON | (18c) |

(20)  Alguien conoce a algún periodista que ha cometido un delito

'Someone knows some journalist who has committed a crime'

There is a known journalist

All the propositions in (B18 a,b,c) imply ( B 20) and are true in a world that has at least one journalist who has committed a crime and at least one individual who is not a journalist and knows a journalist, while at the same time the propositions in (A16 a,b,c) are false in the same world because the individual who is not a journalist does not know a journalist.

A.          (16 a,b,c)

B          (18a,b,c)                                    (20)

⇔
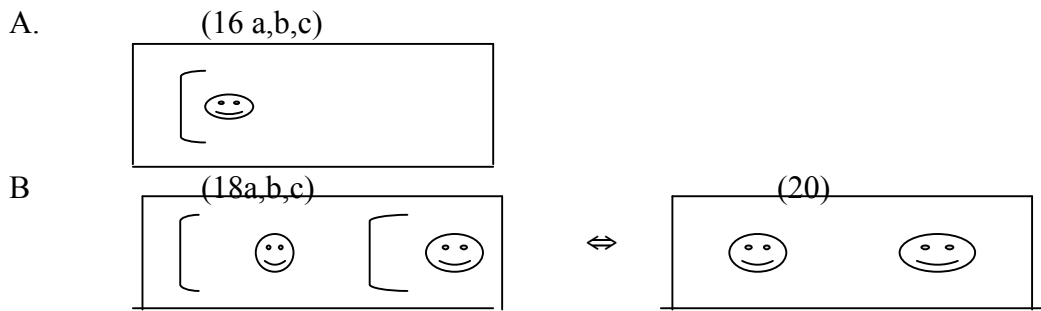
One meaning (A) emerges from the possibility of having only one circuitry in one cohesive compartment with two Vbs while another meaning (B) emerges from having two sub-circuitries in one cohesive compartment. Doubling NEG sub-circuitries in one compartment is equivalent to not having a NEG circuitry at all, making two negative sub-circuitries and two positive sub-circuitries synonymous in the same compartment (B).

Now observe the following data from the same language.

(21)  a.  Sabe  **no'** hacer <u>**nada**</u>  Still  'He knows to do nothing'

b.  **No** sabe hacer **nada**  $\left\{\begin{array}{l}\text{Still} \\ \text{Move}\end{array}\right.$  'He does not know to do anything'
'He does not know to do nothing'

c.  **No** sabe **no'** hacer <u>**nada**</u>  Move  'He does not know not to do anything'

d.  Sabe +que **no'** hace <u>**nada**</u>  Still  'He knows that he does nothing'

e.  ***No** sabe que hace **nada**  'He doesn't know that he does anything'

f.  **No** sabe + que **no'** hace <u>**nada**</u> Still  'He does not know that he doesn't do anything'

First consider (21a,b,c). (21a) is true when we attribute stillness to a given individual and false when we attribute to him movement. (21c) is true when we attribute motion to an individual and false when we attribute to him stillness. In (21c) two NEG sub-circuitries cancel out in the same cohesively interconnective compartment, like (18, 20', B) above. Stillnes emerges when there is only one compartment circuitry of negation with NEG 2 and its Ms stabilises rightwards, either wrapping the RIGHT Vb (21a) OR wrapping the cluster of two verbs. Now, movement emerges in (21b), I suggest, when we strongly focus on a subset of the sequence |hace <u>nada</u>|. This intense focussing might produce the breaking of the strong bonding which keeps the Vb cluster interacting, allowing for a virtual fabrication of Ms which virtually attaches to the Right Vb without activating the phonology of the Ms. This virtual redundant Ms might have the knock-on effect in this compartment to shift the meaning, since a second sub-circuitry of negation must regulate now the already phonologically present left Ms |no' sabe|. Synonymity between (21b) and (21c) can then be emerging from controlling the ON/OFF of the phonology of the right MS, while keeping on, in both, two sub-circuitries, two NEGs (NEG1 and NEG 2) and two Negs. In (21b) the switch of perception on ONE linguistic object could be produced by modulating the intensity of the focus of NEG2 in a cohesevily interacting compartment (see how intense focus shifts perception for each cube in Appendix Fig. 4).

Consider now (21 d,e,f). Here, it looks as if there are two sub-compartments as in B. However, the two NEG circuitries do not cancel out (21f). This suggests that there are two segregated compartments in the same compartment (D). The presence of RIGHT NEG2 |hace <u>nada</u>| with a backward orientation cannot be focussed counting on one negation circuitry (C 21a,b) or two sub-circuitries (B 21b,c). The RIGHT NEG 2 has to turn on one compartment circuitry ( D 21d,f) "independently" of the left compartment decision showing that two phonological Vbs are not interdependent and segragated.
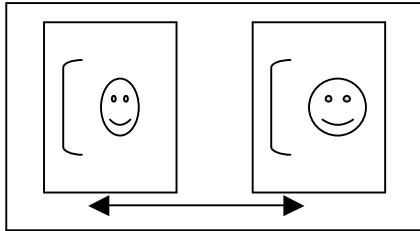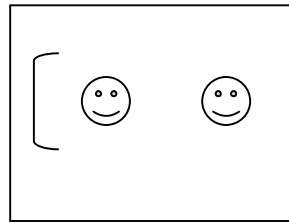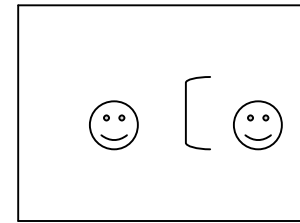
D. (21f)  C.(21b)  C. (21a)

It has been suggested that meaning emerges if there is a NEG regulatory system (15') which can control the production of chunks in a sequence. The possibility of intervals repelling by segregating percepts into two compartments (see Fig 5 and D), or attracting percepts by integrating them into one cohesively interactive single compartment (see Figs.1,2,3 and A,B,C), seems to be an important factor in the way a circuitry operates and meaning emerges. More research needs to be done to find out how this repelling and attracting bonding is regulated. It would also be important for the understanding of biological systems to assess if the decision-making of Ms production by a compartment or sub-compartment circuitry of negation, refers to the notion of reentrant put forward by Edelman [4; 102-124].


## 4. Conclusion

It has been suggested that the orientation factor, the compartment circuitry and the modulation of focus, might be playing an important role in the regulation of redundancy. Examples taken from both the phonological and syntactic levels of combination have been provided. Understanding how, where and when linguistic motor chunks are formed is probably not different from understanding how, when and where other sensory reactions are integrated in meaningful perceptions.

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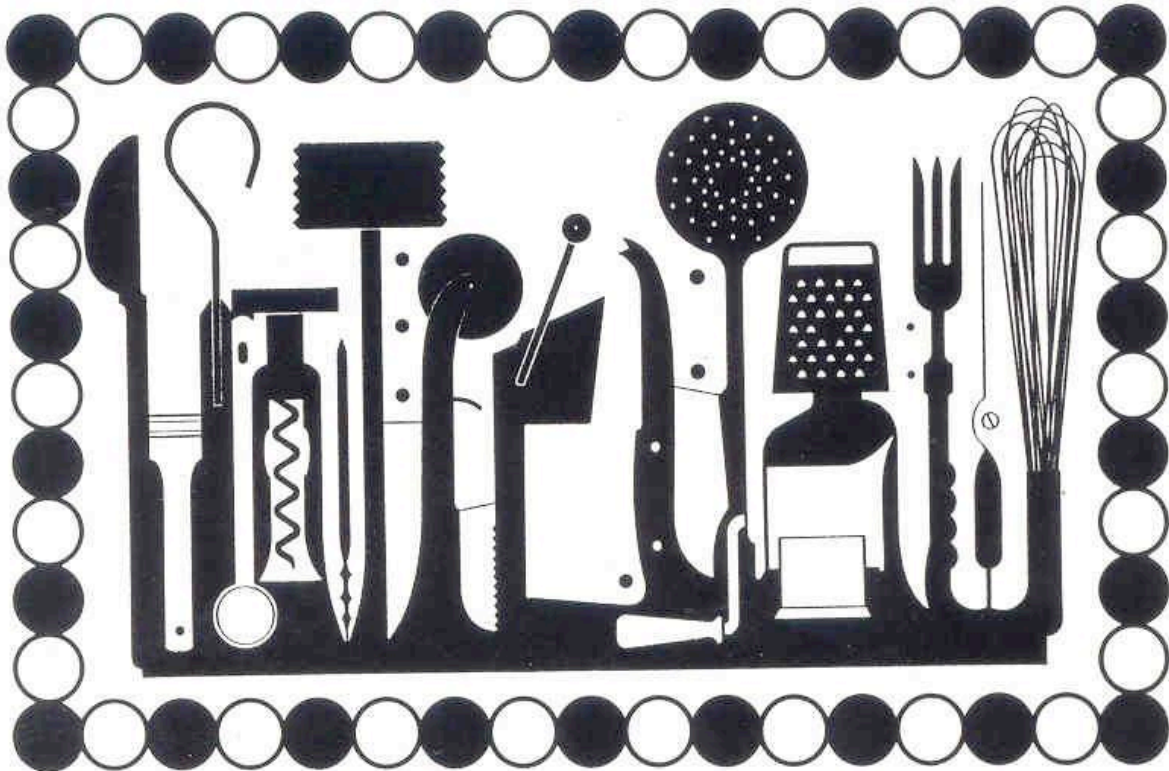Contact:      Paloma.garcia-bellido@mod-langs.ox.ac.uk
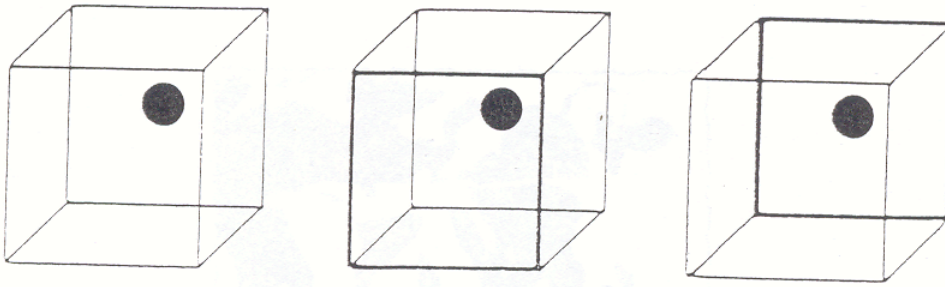
F.1

bottle interval

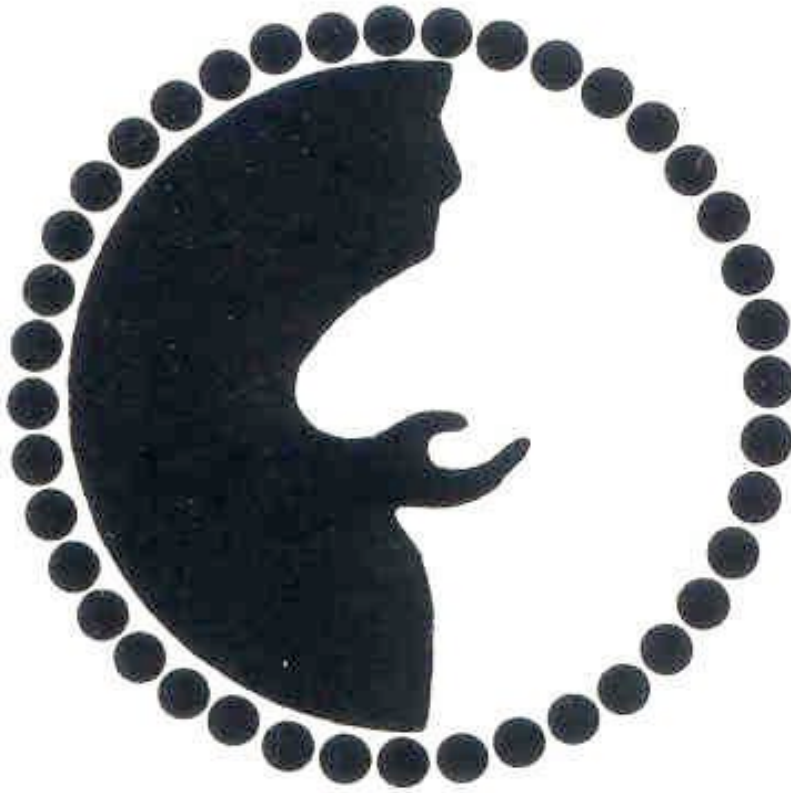glasses frame



F.2

glass interval

bottles frame



F.3. Recursion of intervals (white) and frames (black).
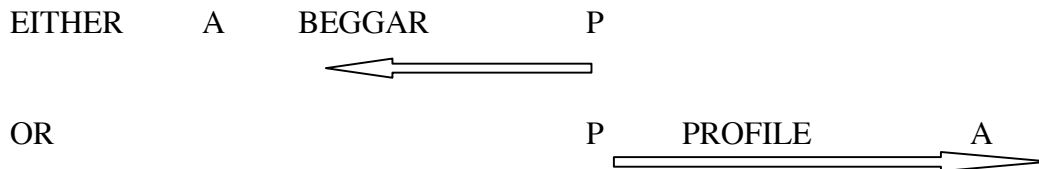
ONE COMPARTMENT STABILISATION

F.4. Shifting meaning



F.5.TWO COMPARTMENT STABILISATION

No interval.

EITHER        A        BEGGAR                    P

⇐

OR                                                P        PROFILE                    A

⇒