Syntactic Complexity from a Language Acquisition Perspective

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Edited by

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CHAPTER ONE

INTRODUCTION

ELISA DI DOMENICO

1. Linguistic Complexity from the Acquisitional Perspective

The issue of linguistic complexity is a main topic in the recent relevant literature, with researchers from different linguistic backgrounds progressing in the attempt to identify factors, measures and metrics of complexity in different linguistic sub-domains (morpho- syntax, lexicon, phonology, semantics, discourse). We may indeed look at linguistic complexity from many perspectives, ranging from historical linguistics and evolution, to formal theoretical linguistics, comparative syntax (including the comparative study of Sign Languages and Creoles), psycholinguistics, neurolinguistics and computational linguistics. [1]

The peculiarity of the acquisitional perspective lies in the fact that it offers a particularly grounded and non- aprioristic starting point for any consideration on linguistic complexity, namely the simple, basic axiom in (1):

(1) A more complex item is expected to be acquired later than a less complex one.[2]

Reading (1) in the direction suggested by its formulation, acquisitional data can be taken as evidence for formal analyses of an item as more or

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[1] For a representation of this variety of approaches see, for instance, the collection of studies in Newmeyer and Preston (2014).
[2] Some version of (1) is more or less explicitly assumed in all the studies here reviewed or collected, though in some cases not as an axiom but rather as a hypothesis to be demonstrated (e.g. Jakubowicz, 2005, 2011; Moscati and Rizzi 2014; but see Chapter 2, *this volume)*. In (1) 'item' is to be intended as any linguistic element or process, with its related structure and the computations it involves, and is thus assumed to hold true also beyond the syntactic domain.

less complex.   Reading (1) in the opposite direction, acquisitional data can be the input to formal linguistic analyses: if an item is acquired early it should not be analyzed as particularly complex, while, conversely, if it is acquired late it should be considered complex. [3]

    To this end, the comparative study of the comprehension and productions of children at different stages of development is a fundamental discovery tool when looking at complexity from the acquisitional point of view.[4] But then the challenge will be to uncover what makes an item complex, where exactly complexity lies, what kind of complexity is involved.

    The basic axiom in (1) thus allows, and at the same time forces, the tight, bi- directional interplay between acquisitional findings and formal/ theoretical considerations which characterizes most studies on complexity from the acquisitional perspective, including the contributions collected in this volume, giving novel substance to the long- standing (Chomsky 1965), though not at all obvious, view of linguistic theory as a theory of language acquisition.

    A systematic recollection of the discoveries prompted by this approach is far beyond the scope of the present lines: in what follows I will just mention a few representative examples from the literature to illustrate this way of working. These examples, as well as the contributions collected in this volume, deal with syntactic complexity, here intended, following Hale and Keyser (1993), as *s*- syntax (sentence syntax) as well as *l*-syntax (lexical syntax).

    A finding that goes back to the late '60s, in Carol Chomsky's (1969) seminal work, for instance, is that subject control structures with verbs of the *promise* type (as in (2)) are mastered surprisingly late by children, compared to object control structures (as in (3)) which are mastered earlier:

(2) John promised Bill [PRO to leave]

(3) John ordered Bill [PRO to leave]

    Carol Chomsky's proposal to account for this data is that children strictly adhere to the Minimal Distance Principle (Rosembaum 1967), which bars subject control, and only at a later stage can master exceptions to this principle. In the same spirit, Belletti and Rizzi (2013) propose a complexity factor (intervention) at the root of subject control structures as

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[3] Both directions can be pursued at the same time, as in Chapter 4, *this volume* .
[4] Different children, as in cross-sectional studies, or the same child or children, as in longitudinal studies. Stages of development can be identified by age or by Mean Length of Utterance (MLU).

well as of other structures with belated acquisition (such as object relatives and passive), interpreting the acquisition of 'exceptions' as the capability of overcoming this complexity factor, possible once peculiar devices are available to the child.

Defining intervention as the difficulty of computing a local relation across an intervener able to bear the same relation,[5] object relatives are more complex than subject relatives, since in the former the subject intervenes between the head of the relative and its copy in its first merge position (4), while no intervener blocks the relation between the head of the relative and its copy in subject relatives (5):[6]

(4) Show me <u>the cow</u> that <u>the lion</u> is wetting <<u>the cow</u>>

(5) Show me <u>the cow</u> that <<u>the cow</u>> is wetting <u>the lion</u>

Still, object relatives are possible, though harder to process (Warren and Gibson, 2002 among many others) than subject relatives in adult language, as well as in child language after a certain age. Friedmann, Belletti and Rizzi (2009) proposed that adults and elder children are able to cope with intervention if the intervener and the target are in an inclusion relation as for their featural array,[7] as shown in (6), where [+ R] is the scope - discourse feature attracting the relative head, while [+NP] expresses its lexical restriction:[8]

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[5] Following the general locality principle known as Relativized Minimality (Rizzi 1990; 2004)

[6] Indeed, subject relatives are not problematic for the same population, i.e. the Hebrew speaking children aged 3.7 – 5.0 tested in Friedmann, Belletti and Rizzi (2009). The asymmetry between subject and object relatives in acquisition is a well - known observation (since Brown 1972), and equally well known is the similar acquisitional asymmetry differentiating subject and object *which*- questions (see e.g. Chapter 3, *this volume,* and the references quoted there). Besides replicating these asymmetries, Friedmann, Belletti and Rizzi (2009) showed that, in some cases, as e.g. in the object relative below, the difficulty children experience with object questions and object relative clauses disappears:
    (i) Show me <u>the cow</u> that <u>he</u> is wetting <<u>the cow</u>>
[7] For some differences between the featural approach to Relativized Minimality illustrated   here and the one developed in Starke (2001), see Belletti and Rizzi (2013).
[8] If the target and the intervener are identical as for their featural array, the resulting structure is ungrammatical in the adult grammar, as in weak wh- islands (i), while if they are in a disjunction relation the derived structure is well formed (ii):
    (i) * How do you wonder [who behaved ____] ?

(6) Show me <u>the cow</u> that <u>the lion</u> is wetting < <u>the cow</u>>
          [+R, +NP]   [+NP]   [+R, +NP]

   The capability of mastering the inclusion relation is thus what differentiates the adult grammar from the grammar of children below 6.
   A problem of intervention also arises in passive and control structures, but in these cases a different way of overcoming the problem is adopted.
   In passive, if, as would follow from Baker's (1988) Uniformity of Theta Assignment Hypothesis, the external argument is syntactically projected, it intervenes in the chain created by the object in its movement to the clausal EPP position. Collins (2005) proposed that this intervention problem is overcome by the preliminary movement of a VP chunk containing the verb and the object (*smuggling*). The object will then move from the derived position of the VP chunk:

(7) [$_{TP}$ [$_{vP}$V DP] *by* [$_{vP}$ DP [$_{vP}$ V DP]]

   The late acquisition of passive can be thus explained assuming the complexity of the *smuggling* operation which needs some time to develop. Once *smuggling* is at disposal, however, children (as well as adults) seem to resort to it quite extensively: this is one of the main findings in Belletti and Contemori (2010) and Contemori and Belletti (2014), where elder children and adults often produced what the authors call a Passive Object Relative (POR), as (8.b), instead of the object relative (8.a), which the experimental condition was meant to elicit:[9]

(8) a.   Vorrei   essere il bambino che la mamma copre
          I would rather be the child that the mother covers

    b.   Vorrei   essere il bambino che è coperto dalla mamma
          I would rather be the child that is covered by the mother

   The procedure that moves a verbal chunk across an intervener is not at

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      (ii)   How do you wonder [John behaved _____] ?
In the sentence in footnote 6 above, the elimination of the [+NP] feature from the intervener (*he*, instead of *the lion* as in (4) and (6)) renders the target and the intervener (*the cow* and *he*) disjunct as for their feature composition.
[9] This suggests that avoiding intervention through *smuggling* is less complex than mastering the inclusion relation, which is required by object relatives.

all confined to passive.[10] As Belletti and Rizzi (2013) propose, it might be the procedure allowing subject control, which should be banned under Relativized Minimality (subsuming Rosembaum's, 1967 Minimal Distance Principle), the object intervening between the subject and PRO:[11]

(9) John promised Bill [PRO to leave early]

   In their analysis, *smuggling* is a necessary ingredient of the procedure deriving the lexically decomposed (*à la* Hale and Keyser, 1993) structured meaning of subject control verbs of the *promise* type, making the subject the closest controller for PRO.
   They start from the assumption that *promise* allows the paraphrase in (10), with the light verb *make* + the nominal element *promise*, which, incorporating into the light verb would produce the verb *promise* itself:

(10) John made Bill the promise [PRO to go]

Bill is a kind of benefactive of the promise, and the benefactive relation is assumed to be mediated by a benefactive particle- like functional head (*ben*), yielding the structure in (11):

(11) John $_{Vmake}$ [Bill *ben* [promise [PRO to go]]]

The presence of *ben* makes the configuration not sufficiently local for the incorporation of the noun *promise* into the light verb to take place, and locality is restored through movement of the verbal chunk [promise [PRO to go] which *smuggles* the noun *promise* to a position suitable for incorporation:

(12) John $_{Vmake}$ [promise [PRO to go]] [Bill *ben* t]

The surface word order is then obtained through extraposition of the infinitive:

(13) John promise + $_{Vmake}$ [[t$_{promise}$ t$_{infinitive}$] [Bill *ben* t]] [PRO to go]

   In (13) the object *Bill* does not c-command PRO, and thus the closest potential controller is the subject.

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[10] See Belletti and Rizzi (2013) for a sketchy list.
[11] As the authors underline, this analysis is not committed to a movement approach to control.

Under this analysis a single factor (intervention) and two mechanisms to avoid it (mastering inclusion and *smuggling*) explain long dating and robust acquisitional findings in three distinct complex domains: object relatives, passive, and subject control.[12]

But the tight interplay between acquisitional findings and formal linguistic analyses, as we said, can also work in the opposite direction: the analysis of an item as complex can be confirmed by its belated acquisition.

Moscati and Rizzi (2014) analyze three different types of agreement configurations in Italian (Determiner – Noun, Subject – Verb, Clitic – Past Participle) arguing that they can be ranked on a scale of complexity in terms of the movement operations that they involve and of the derived representations at interfaces. Hence they should be mastered by the child at different stages: a prediction that is confirmed both by data available from previous *corpus* studies and by the data experimentally collected by the authors. The three types of agreement are illustrated in (14) (from Moscati and Rizzi, 2014:68):

(14) a. D-N agr: Le   case
                         $The_{f.plur}$ $houses_{f.plur}$

     b. Subj- V agr: Gianni   parte
                         $Gianni_{3P.sing}$ $leaves_{3P.sing}$

     c. Cl- PstPart agr: Gianni le   ha viste
                         Gianni $them_{f.plur}$ has $seen_{f.plur}$

The simplest agreement type is   D – N (14.a) in that it involves no movement at all, and is seen by the authors as a morphological reflex of external merge putting D and N together. Subj- V agreement (14.b) involves movement of the subject from its thematic position in the vP to a functional head in the clausal architecture bearing unvalued Phi- features (labeled Subj by the authors, following Rizzi, 2006), a criterial position where the subject is frozen in place (Rizzi, 2006). The Cl- Pst Part agreement (14.c) is the most complex configuration, where agreement is checked 'in passing' of the clitic through the position where it triggers agreement on the past participle (an aspectual head, as in Cinque, 1999) before reaching its final destination, i.e. the clitic position in the functional structure of the clause (Kayne, 1989; Belletti, 2006). Data gathered through the experimental paradigm of the Forced Choice of Grammatical Form

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[12] Plus object *which*- questions, see footnote 6 above.

(where the child has to choose which one of the two sentences he is faced with is grammatical) confirm the predictions: while children at the age of 3 have a virtually perfect knowledge of D-N agreement, their performance is still inaccurate with Subj- Verb agreement. At the age of 4, their accuracy with Subj- Verb agreement reaches a level in which it is not significantly different from their accuracy with D-N agreement. The most problematic kind of agreement is the Cl- Pst Part, where a significant proportion of wrong answers is still present at the age of 4.

Two factors of complexity are singled out by this study: the general cost associated with a movement operation, and a second factor related to the landing site of the moved constituent.[13]

The idea that movement (or 'internal merge', following Chomsky, 2001) operations are costly in acquisition is at the base of the Derivational Complexity Metric (Jakubowicz, 2005, 2011) in (15), associated to the Derivational Complexity Hypothesis, which states that less complex derivations are input convergent, i. e. emerge in acquisition, before more complex ones:

(15) Derivational Complexity Metric (DCM)

  a. Merging α_i n times gives rise to a less complex derivation than merging α_i ($n + 1$) times

  b. Internal Merge of α gives rise to a less complex derivation than Internal Merge of $\alpha + \beta$. [Jakubowicz, 2011: 340]

In Jakubowicz (2011), the predictivity of DCM has been tested examining the acquisition of wh- questions in French by typically developing children and by children with Specific Language Impairment (SLI henceforth, Gopnik and Crago, 1991 and much subsequent work).[14] First of all, different types of root wh- questions and direct wh- questions from embedded clauses (including some types attested only in child French

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[13] '[…]Satisfaction 'in passing' is more complex than satisfaction at the head of a chain because checking the correctness of the configuration involves a kind of 'reconstruction' in the position of the trace' [Moscati and Rizzi 2014:69]. The authors also suggest an additional potentially relevant element of complexity differentiating Cl- Past Participle agreement from Subj- Verb agreement, in that in the former case the movement chain spans over two distinct phases, in the sense of Chomsky (2001).

[14] Specific Language Impairment is commonly defined as a language acquisition disorder in the absence of other mental, neurological or perceptual deficits.

and not in adult French) are analyzed and ranked according to DCM.[15] According to (15.a), wh-questions involving no internal merge of the wh-element, as wh- *in situ* questions (16), will be less complex than fronted wh-questions (17); questions that involve a smaller number of the internal merge operation (17) will be less complex than those involving a higher number of internal merge operations (19); according to (15.b), wh-fronting without V-to-C (17) will be less complex than wh-fronting with V-to-C (18):

(16) Tu as vu qui?
        'You saw who(m)?'

(17) Qui_i tu as vu t_i?
        Lit.'Who(m) you have seen?'

(18) Qui_i as_k tu t_k vu t_i?
        Lit. 'Who(m) have you seen?'

(19) Qui_i pense-t- elle [t_i que tu as vu t_i]?
        Lit. 'Who thinks she that you saw?'   [Jakubowicz, 2011]

    The prediction suggested by the Derivational Complexity Hypothesis is that the less complex (in terms of DCM) types of questions will emerge first. This prediction was then tested through an elicited production task (Strik, 2008 and the references quoted there), administered to three groups of typically developing children (aged 6, 4 and 3), two groups of SLI children (aged 8 and 11) and a control group of adults. Briefly summarizing the results to the point relevant for the present discussion, data revealed that in the younger typically developing groups and especially in the SLI group, the production of long distance direct questions was not consistent with adult grammar: children tried to produce these sentences but often failed to

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[15] Four types of wh- question in root clauses and seven in long distance direct wh-questions from embedded clauses are analyzed and ranked in this study. Of the latter group, three belong to child French: special partial movement (i), partial movement (ii) and wh- copying upstairs with wh- *in situ* downstairs:
  (i)   Billy a dit [qui_i Grenouille a vu t_i]?
          Lit.' Billy said who Frog saw'
  (ii)   Qu'est-ce que Billy a dit qui_i Grenouille a vu_i?
          Lit. 'What did Billy say who(m) Frog saw?'
  (iii) $Où_i$ Billy a dit t_e [que Canard a acheté le cadeau $où_i$]
          Lit. 'Where Billy said that Duck bought the present where?'
See Jakubowicz, 2011: 341ff.

do so correctly or adopted various kinds of avoidance strategies.[16]

This confirms the general validity of the DCM and sheds light on another aspect that characterizes the study of complexity from the acquisitional perspective: the comparison of L1 typical acquisition with other modes of acquisition.

In Jakubowicz (2011), the comparison is between typically developing and SLI children acquiring their L1. Productions and avoidance strategies of SLI children prove to be in line with those of typically developing children at younger ages in this study (but see below).[17] This is one of the possible outcomes of the comparison between typical and SLI acquisition, in both production and comprehension, as Belletti and Guasti (2015) note: in other cases the two modes of acquisition do not seem to proceed in a parallel way. SLI children seem to have problems in specific domains, such as verbal tense- agreement morphology (Cipriani *et al.* 1998, Clahsen *et al.* 1997, Rice and Wexler 1996) unnoticed in typical development. Specific difficulties have been interpreted as cues for the identification of different types of SLI (Friedmann and Novogrodsky, 2004, 2011). Some particularly complex domains (e. g. clitics,) are so challenging for SLI acquirers that they may be considered a clinical marker (Vender, Guasti Garraffa and Sorace, 2014 a. o.). In some complex domains, furthermore, (e.g. wh- questions, Hamann, 2006, and the above discussed Jakubowicz, 2011, or object relative clauses, Friedmann, Yachini and Szterman, 2015, Hamann and Tuller, 2015 a. o.) the difficulty may persist over the years in SLI speakers, leading to stagnation: this may reveal, as Belletti and Guasti (2015) note, that there might be some linguistic properties that need to be acquired at a critical time.

Some studies (e.g. Håkanson and Nettelblatt, 1996; Paradis, 2004) point to similarities between SLI and second language acquisition, while other studies (Vender, Guasti, Garraffa and Sorace 2014) also highlight substantial differences in the two acquisition modes (see Chapter 6, *this volume,* for extensive discussion and new data).

When we come to second language acquisition, different, interrelating conditions, such as age of onset of acquisition, cross- linguistic influence (or 'transfer' from the L1) and, possibly, input differences, contribute to partially differentiate this mode of acquisition from typical L1 acquisition as well.

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[16] Adjunction strategies, parataxis, indirect questions and the three question types described in footnote 15 above.

[17] Jakubowicz (2011:340) claims indeed that the Derivational Complexity Hypothesis (with its associated Metric): '[..] applies to different conditions of language acquisition: L1, L2, SLI, etc.'

A clear way in which all these conditions are connected to the issue of linguistic complexity is that their effect is assumed to emerge particularly in linguistically complex domains. A case in point is represented by object clitics. Seminal work by Hamann and Belletti (2006), for instance, brought to light a peculiar production error pattern that differentiates child and adult L2 acquirers, on one side, from monolingual typical and SLI children on the other, in the acquisition of object clitics in French. [18]

Romance object clitic pronouns are delayed in all acquisition modes, and this delay is traced back by the authors to their complex derivation: they are first merged as maximal projections (XPs) and end up as heads in a position high in the clausal architecture. Hamann and Belletti (2006) note that while omissions of object clitics (in turn reflecting their complexity) are found in all the acquisitional modes examined, placement errors of the type in (20) were found only in (child and adult) L2ers:

(20) a. c'est à moi, le   Elisa, German- French child L2er
          it's to me, him/he
          'it's mine, that one'

      b. ça a m'etranglé
          that has me strangled
          'that strangled me'

It is worth underlining that in the case just described the differences between L2ers on one side, and (typical and SLI) L1 acquirers on the other, do not question the complexity of object clitics, which are and remain a complex domain in all the acquisition modes examined. [19]

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[18] Following Hamann and Belletti (2006), we will distinguish bilingualism (or 2L1, i.e. the simultaneous acquisition of two languages from birth) from child L2 acquisition (where a second language starts to be acquired after a first one in the early ages), from adult L2 acquisition. Child L2 acquisition may be further differentiated in early and late child acquisition. Some authors prefer to distinguish simultaneous and sequential (child and adult) bilingualism. Whatever the terminology adopted, the differentiating factor in this typology is age of onset of acquisition of the second language, which interacts with cross- linguistic influence: the latter is not expected to occur in (simultaneous) bilingualism (given the hypothesis that the two linguistic systems develop separately, although simultaneously, in the bilingual mind) unless input from one of the languages can be analyzed through the grammar of the other language (Hamann and Belletti 2006:45, following Hulk and Müller, 2000).

[19] As we will see in Chapter 7, *this volume,* object clitics are a complex domain for heritage speakers as well. A 'heritage language' is a first language (L1) which is not

A less clear case is a domain at the syntax – pragmatics interface, where answering strategies, which seem to be in place early on in first language acquisition (Belletti 2007) are subject to protracted transfer from the L1, even at advanced stages, in L2 acquisition.[20] Under the assumption that cross-linguistic influence manifests itself in complex domains, the syntax – pragmatics interface is thought of as a complex, or 'vulnerable' domain in L2 acquisition (Hulk and Müller, 2000, Sorace and Filiaci 2006, White 2011 a. o.; see also Chapter 8 and Chapter 9, *this volume,* for discussion and new data).

2. Syntactic Complexity in Different Modes of Acquisition

The contributions collected in this volume all deal with syntactic complexity from an acquisitional perspective. The chapters in Part I examine peculiar syntactic aspects in typical L1 acquisition, while in Part II other modes of acquisition are also considered, whether singularly or comparatively: SLI and heritage L1 acquisition, bilingual typical and SLI acquisition, child and adult L2 acquisition. Novel factors of complexity are proposed and characterized (while the role of other factors is put into question); some complex domains are comparatively analyzed and possibly ranked in terms of complexity; new elicitation procedures concerning complex structures are proposed and tested; new data concerning the way in which different populations of acquirers deal with some complex domains are provided.

The languages considered, sometimes comparatively, range from Italian, to German, French, Romanian, European Portuguese and Finnish.

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the dominant language in the speaker's life and environment. Heritage speakers acquired their first language at home, but live in an environment that speaks another language. 1st generation heritage speakers acquired their L2 as adults (e.g. they migrated to another country). Their heritage language is typically acquired, but can be subject to attrition from the dominant language. 2nd generation heritage speakers are, strictly speaking, bilinguals or child L2 acquirers (see footnote 18 above). Their L1, the heritage language, can suffer from limited input and use, as well as from cross- linguistic influence from the dominant language.

[20] Tsimpli (2014) assumes that early acquired phenomena (in turn related to macroparameters) can differentiate between simultaneous and (early) successive bilingualism with an advantage for the former group, while late and very late acquired phenomena reveal very similar (high or low) performance across bilingual groups, differentiating them from monolinguals.

2.1 Insights from Typical L1 Acquisition

In **Chapter 2**, *Adriana Belletti* faces the issue of the factors determining complexity in acquisition through a peculiar, second level, kind of data stemming from the comparison of recent findings from typical L1 acquisition of Italian with adult Italian data in the same experimental settings, as well as with *corpora* of adult Italian (hence with what may be considered children's input) in three different empirical domains (relative clauses, various types of passive, post-verbal subjects with unaccusatives).

Adhering to the idea that what is more complex is acquired later, the author shows, through this comparison, that pre-theoretical complexity factors such as frequency in the input or number of words in a sentence do not seem to play a role in acquisition, challenging approaches to language acquisition framed in terms of analogy or imitation: children don't do what adults do in the same experimental setting nor do they do what they hear most, but they sometimes do, instead, what might be thought of as more complex in terms of pre-theoretical complexity factors.

As discussed in Section 1 above, for instance, PORs are used as a way to avoid intervention when an object relative is elicited, by adults and by elder children (Belletti and Contemori, 2010; Contemori and Belletti, 2014).[21]

When detailing the kind of PORs used in elicited production, *si*-causative passives (as (21)) are the most frequent kind of POR used by children in experimental conditions (Contemori and Belletti, 2014), though they are very rare in naturalistic *corpora* (Belletti and Chesi, 2014), and also very rare, in fact absent, in adults' elicited productions:

(21) Il bambino che si fa   pettinare dalla   mamma
       The kid   that makes himself(cl) comb   by the mum

The kind of passive mostly resorted to by adults is a reduced POR (as (22)), not resorted to by children:

(22) Il bambino che è/viene   pettinato dalla mamma
       The kid   that is/comes combed   by the mum

As for number of words, reduced PORs should be thought of as less complex than their non- reduced counterpart. Furthermore, reduced PORs are more frequent then non- reduced ones in what might be thought of as

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[21] PORs in general are instead quite rare in naturalistic *corpora* (Belletti and Chesi, 2014)

the children's input,[22] so they should be preferred by children, contrary to fact. Then the task for the linguist is to uncover which formal factors make reduced PORs complex for children, and which ones make *si*- causative PORs simpler, and hence preferred by children: principled reasons (e.g. labeling, Belletti, *forthcoming*) may favor access to the latter, while the complexity of the reduction operation may disfavor access to reduced PORs. In the last part of the chapter another seemingly complex, but early acquired phenomenon is considered: young children's sensitivity to the Definiteness Effect on post- verbal subjects of unaccusatives (Vernice and Guasti, 2015). As the author details, this constraint is quite complex to induce from the Italian input data, which are rather opaque in this respect.[23] Children's sensitivity to this constraint shows that they single out the unaccusative verb class from early on (see also Chapter 5, *this volume,* and the references quoted there) and from early on they master the definite/ indefinite distinction. This distinction appears to be well rooted in their internal grammar, suggesting that it does not need to be learned. This points to the conclusion that internal grammatical factors play a crucial role in language development.

In **Chapter 3**, *Elena Pagliarini and Maria Teresa Guasti* discuss (and characterize as for its developmental pattern) a novel locality mechanism to account for the acquisional asymmetry between subject and object *which*-questions (see footnote 6 above), which they name 'Agree intervention'. They start from the observation that in Italian, in object *which*- questions, the subject does not, in fact, intervene between the wh-object and its copy since it is typically realized post- verbally:

(23) Quale fatina stanno spingendo le   signore?
      Which fairy are   pushing   the ladies?
      Which fairy are the ladies pushing?

Still, object *which*-questions are challenging for Italian speaking children, as they are for English (or Hebrew) speaking children (De Vincenzi at al. 1999). Following Guasti, Branchini and Arosio (2012), Pagliarini and Guasti argue that the locality violation (intervention) occurs when the Agree relation between the inflectional head and the subject in its thematic

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[22] Though PORs are rare in naturalistic *corpora,* in child directed speech reduced PORs are overwhelmingly the most attested kind of POR used by adults.

[23] While post-verbal subjects are widespread in Italian, the Definiteness Effect (i.e. the requirement that the subject be indefinite) only holds for post – verbal subjects of unaccusatives under particular discourse conditions, i.e. in all new sentences.

position is established, and the copy of the moved wh-object intervenes: [24]

(24) [CP Quale fatina stanno [AgrOP <quale fatina> spingendo] [vP le signore]]?
Which fairy   are   <which fairy>   pushing   the ladies?

Agree intervention is sensitive to different features with respect to what they call 'Argument intervention' (the kind of intervention discussed in Section 1 above for object relatives, passive and control, according to Belletti and Rizzi, 2013): formal features such as, e.g. case, as opposed to features involved in establishing reference, e.g. [+ NP]. To this end, *which-* and *how many-* questions should be equally challenging for children because the featural difference they entail (*which-* questions asking for identity of the referent (DP), *how many-* questions for its numerosity (QP)) is not relevant for Agree intervention. These predictions established, the paper presents and discusses two experimental studies on Italian speaking children, one comparing the comprehension of *which-* and *how many-* questions, and one comparing object questions with pre and post-verbal subjects. Results confirm the predictions: the subject/ object asymmetry holds in the same fashion for *which-* and *how many-* questions, despite the fact that they ask for different referents; the scores obtained by children in *which-* questions with pre- verbal subjects doubled the scores obtained with *which-* questions with post- verbal subjects. Two different locality mechanisms, sensitive to different features, and with different developmental patterns, are active in grammar: one concerned with the formation of chains (Argument intervention) and one valuing the inflected verb (Agree intervention).

Two types of relative clauses in German (verb final (25.a) and V2 (25.b) relative clauses) and their acquisition are the topic of **Chapter 4**, by *Emanuela Sanfelici, Petra Schulz* and *Corinna Trabandt*:

(25) a. *Hier gibt   es   zwei Frauen, die   den*
here there-is EXPL two women PRON:NOM the:ACC
Präsidenten getroffen haben
president   met   have
'Here there are two women that met the President.'

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[24] Agree intervention does not arise when the subject is pre-verbal:
(i) Quale fatina le signore stanno spingendo?
Which fairy the ladies are   pushing?

b. *Hier gibt   es   zwei Frauen, die   **haben***
here there-is EXPL two   women   PRON:NOM have
den   Präsidenten **getroffen**
the:ACC president   met
'Here there are two women that met the President.'

V2 relative clauses (iV2s) are one of the specific syntactic environments in which V2 is licensed in subordinate clauses in German.[25] Previous analyses of iV2s (e.g Gärtner 2001 a/b) claimed that they are not an instance of subordination, but are rather main clauses which are paratactically coordinated with a main clause containing a presentational or existential predicate. Acquisitional evidence seemed to support this analysis, as several studies (e.g. Brandt 2004, Diessel and Tomasello 2005, Brandt *et al.* 2008, but not e.g. Clahsen 1990, Rothweiler 1993) have reported that iV2s are the first type of relative clauses in the spontaneous production of children up to 4.

   The authors investigated whether 3-year-old children prefer verb final relative clauses or iV2s in a controlled experimental setting (using a picture- supported delayed repetition task) where the syntactic and semantic conditions allowed for both structures. Results show a robust preference in children for verb final relative clauses over iV2s: while adult controls correctly repeated iV2s, children showed a strong tendency to change an iV2 into a verb final relative clause This findings, the authors argue, contradict the acquisition pattern described in Brandt (2004), Diessel and Tomasello (2005), Brandt *et al.* (2008), and are also a challenge for the coordination analysis of iV2 clauses. They outline an analysis of iV2s whereby the latter are considered a case of embedded root phenomena. Namely, iV2s are CPs in which the embedded verb has moved to C^0 and the *d-* pronoun (*die* in 25.b) is a resumptive (topic) pronoun, an analysis which is carefully shown to capture the syntactic properties as well as the semantic restrictions of iV2s. As for the conflicting acquisitional data, the authors argue that examples interpreted by Brandt *et al.* (2008) as instances of iV2s, are not proper iV2s, but should rather be analyzed as instances of left dislocations (Grewendorf, 2002). So, the authors conclude, it is unclear whether iV2 structures are the first instance of relative clauses even in spontaneous production: acquisition, again, meets linguistic theory.

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[25] V2 is the order in main clauses in German, while subordinate clauses are verb final. The verb placement parameter is acquired early by German speaking children, who correctly place the verb in matrix and embedded contexts at the age of 3 (Sanfelici, Schulz and Trabandt, *this volume*, and the references quoted there).

In **Chapter 5**, *Paolo Lorusso* considers how the complexity of verb classes (i.e. their lexical (*l-*) syntax, and specifically the argument structure they project) affects the production and comprehension of auxiliaries in child Italian. A solid data on the acquisition of auxiliaries in Italian is that *have* appears later than *be*. As well- known since Burzio's (1986) seminal work, unaccusatives (26.a) select the *be* auxiliary in Italian, while unergatives (26.b) and transitives (26.c) select the *have* auxiliary:[26]

(26) a. Gianni è arrivato
      G.   is arrived

   b. Gianni ha parlato
      G.   has spoken

   c. Gianni ha comprato un libro
      G.   has bought a book

Assuming Hale and Keyser's (1993) analysis of unaccusatives, unergatives and transitives, Lorusso proposes that verbs that project an internal argument (i.e. unaccusatives and transitives) are less complex than verbs that project only an external argument (i.e. unergatives) as for their aspectual entailment. Of the former, unaccusatives are the least complex in that they project only an internal argument in the lower VP shell. [27] In the acquisition of constructions with auxiliaries in Italian, the higher complexity of verbs that project an external argument in the vP shell is predicted to play a central role.[28] This prediction is tested through a study of spontaneous production and two experiments. Analyzing the spontaneous production of four children aged 18 – 36 months, Lorusso finds that while they regularly select the right auxiliary, children use more *passato prossimo* forms with unaccusatives and transitives than with

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[26] Auxiliaries in Italian are mainly found in compound tensed constructions, such as *passato prossimo* (as in (26)), which have a perfect aspectual reading.
[27] The eventive relation can be thus be determined entirely within the VP shell. Wide evidence from the literature is discussed by the author, showing that children single out the unaccusative verb class from very early on (see also Chapter 2, *this volume*)
[28] Another factor singling out unergatives from transitives and unaccusatives is dicussed, namely lexical aspect (*Aktionsart*). Unaccusatives and transitives are mainly telic predicates, while unergatives are mainly atelic, since no direct object is involved in the event they denote. The *passato prossimo* gives a perfective entailment to all verbs it applies to.

unergatives. *Passato prossimo* forms with unergatives, appear later in children's productions. The first experiment is designed to test the pattern of production of perfective and imperfective forms along ages and verb classes (telic transitives and atelic unergatives). Results show a systematic general tendency to attribute *passato prossimo* to telic transitives. Children under the age of 5, however, strongly prefer to use imperfective forms with atelic unergatives. Elder children (5 – 7) are able to use *passato prossimo* with both telic transitives and atelic unergatives in a proportion similar to that of adult controls. The second experiment, a comprehension task, wants to discover whether children give a complete/incomplete reading to *passato prossimo* with different verb classes. Results show a systematic completed reading for telic transitives in the *passato prossimo* in younger children, elder children and adults. As for atelic unergatives, results show that a completed reading is not available until the age of 7. Taken together, the results of the three studies confirm that unergatives are more complex than transitives. If, as early sensitivity to unaccusatives confirms, unaccusatives are the least complex class of predicates, *have* is more complex (and hence acquired later) than *be* for the predicates that it selects.   Among the predicates selected by *have*, unergatives are more complex than transitives since their aspect cannot be retrieved directly by an overt direct object: lexical aspect is not mapped in a one- to- one fashion with aspectual morphology below the age of 7.

2.2 Insights from Other Modes of Acquisition

As we have seen in Section 1, comparing different modes of acquisition sheds light on the issue of complexity in many important respects. In studies comparing different modes of acquisition, typical L1 acquisition usually constitutes, using Belletti and Guasti's (2015) words, a sort of baseline against which other modes of acquisition are compared. This is not entirely so in **Chapter 6**, where *Cornelia Hamann, Natalia Gagarina, Solveig Chilla* and *Lina Abed Ibrahim* investigate, through ample discussion of the relevant literature, as well as with a vast amount of novel data, the case of bilingual SLI children dealing with complex structures, with the purpose of identifying critical factors able to disentangle the two conditions of acquisition.[29]

A first research question, disentangling bilingual typical development

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[29] As the authors argue, besides its theoretical relevance, this issue has also a practical relevance connected to the need to establish clinical diagnosis (and therapy) of SLI in bilingual settings.

from monolingual SLI development, is investigated through two studies. The first study compares older monolingual typically developing children and older bilingual typically developing children (from roughly 8 to 10 years); the second study compares younger monolingual typically developing children, younger bilingual typically developing children and age- matched monolingual SLI children (from roughly 5; 6 to 7;6 years). A Sentence Repetition Task including four types of complex structures (passive, subject relatives, object relatives without intervention and object relatives with intervention) was administered to the children.

A second research question, disentangling bilingual typical development from bilingual SLI development, is dealt with through the comparison of four groups of children: monolingual typically developing, monolingual SLI, bilingual typically developing and bilingual SLI. The Sentence Repetition Task employed included the sentence types described above, plus bare and [+NP] wh- clauses, topicalization, finite complement clauses.[30]

As for the first research question, results showed that bilingual and monolingual typically developing children essentially pattern alike. For older children, intervention is clearly the critical factor, since object relatives with NP intervener are significantly more difficult than the other three configurations; long passives, subject relatives and object relatives without intervener are equally mastered. In younger children a similar pattern emerges, with object relatives with intervener as the most problematic clausal type, even though passives and object relatives without intervener appear more difficult than subject relatives. A different picture characterizes SLI children, which had great difficulty with all sentence types: the kind of complexity involved in passive (movement and smuggling), in subject relatives and object relatives without intervener (embedding and movement) is already problematic for these children, and thus the effect of intervention cannot be singled out. As for the second research question, results obtained comparing correct identical repetitions for all sentence types together, show that typical monolingual and bilingual children score alike, and the same holds true for monolingual and bilingual SLI children. Significant differences were found for monolingual SLI and typically developing bilingual children, as well as for bilingual SLI and bilingual typically developing children. Furthermore, results importantly show that bilingualism and SLI do not have a cumulative effect: bilingual SLI children do not perform significantly worse than monolingual SLI children.

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[30] Examples are given in (8) to (15) of Chapter 6.

    In **Chapter 7**, *Cristina Flores, Esther Rinke and Cecília Azevedo*
examine the heritage language production of second generation heritage
speakers in the complex domain of object realization. They analyze
spontaneous production data from two groups of heritage speakers (first
and second generation) of European Portuguese living in Germany, and
compare them with spontaneous production data from two groups of age
(and education) matched monolinguals of European Portuguese living in
Portugal. Object realization is a complex domain in European Portuguese,
a language which has strong and clitic object pronouns. Clitic pronouns
may vary in form and placement depending on the syntactic context in
which they occur.[31] Furthermore, European Portuguese allows specific
null objects. German, the dominant language, does not have object clitics
and does not allow specific null objects, though sentence initial topic drop
is possible.
    First of all, the authors identify and classify the kinds of object
realization in the four *corpora*, marking as 'norm deviation' every
deviation from the expected standard norm.[32] Then they examine the
frequency of the different options of object realization in the four corpora.
This comparison reveals that 2nd generation heritage speakers use all the
possibilities of object realization, as the other three groups.   The
frequencies of the younger generation of heritage speakers resemble those
of their age matched monolinguals: both produce less clitic pronouns and
produce more object omissions than their older counterparts (though these
tendencies are more marked in the 2nd generation heritage speakers). The
latter differ from the other groups in that they use more demonstratives in
object position: 2nd generation heritage speakers avoid clitic pronouns
whenever they can use demonstratives or null objects. The dominant
language, German, does not have null objects so cross-linguistic influence
from the dominant language cannot be invoked as a source,[33] while it could
be involved in clitic omissions. Clitics, however, could also be avoided
because they are complex. Norm deviations, furthermore (as extensive use
of enclisis with respect to proclisis), are attested in all groups with no
significant differences, and are thus considered a typical feature of the
colloquial register. Finally, 1st generation heritage speakers do not show
significant differences as compared to aged matched monolinguals: hence,

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[31] (In)appropriateness, in the experimental *corpus*, was checked by two native
speakers of European Portuguese.
[32] Norm deviation, as the authors underline, may not necessarily reflect
competence deviations, but also variation in the colloquial register.
[33] Null object constructions in the corpus do not display the typical properties of
topic drop in German.

the authors conclude, the input given to the second generation cannot be considered incomplete. Clitic omission thus appears to be the only clear difference in the spontaneous production of 2nd generation heritage speakers: limited use of clitics may have long term effects,   leading to unstable knowledge. This in turn might explain the poor results obtained by 2nd generation heritage speakers in the same domain, but obtained through different methodologies, such as the Grammaticality Judgment Task employed by Rinke and Flores (2014).

Object clitics are again the domain examined in **Chapter 8**, by *Petra Bernardini and Monica Timofte*, in bilingual children, through the comparison of two elicited oral production studies on French/Italian (Bernardini and Van de Weijer, *under review*) and Romanian/ Italian (Bernardini and Timofte, 2014) simultaneous and successive bilingual children. Under the assumption that cross-linguistic influence manifests itself in complex domains (see Section 1 above) the authors examine what kind of complexity is involved in object clitic constructions in French, Romanian and Italian. They compare two kinds of complexity: Interface Based complexity (Müller and Hulk, 2001) and Derivational Complexity (Jakubowicz, 2005, 2011), further distinguishing two subtypes in the latter: DC1 (number of moved constituents) and DC2 (number of movement operations). While French clitic constructions are more complex in terms of DC1, Italian and Romanian clitic constructions are more complex in terms of DC2. In Romanian, furthermore, Interface Based complexity is also involved. [34] The authors then compare the results of the French/Italian study and of the Romanian/ Italian study as for general accuracy and placement errors. Productions in general are more accurate in Italian than in French in the French/Italian study, but as accurate in Italian as in Romanian in the Italian/Romanian study. Placement errors occurred in the modal + infinitive context in the French/Italian study, interestingly revealing cross-linguistic influence both from Italian to French and from French to Italian. In the Romanian/Italian study, placement errors occurred only in Romanian, confirming the higher complexity that clitic placement entails in this language.

Chapter 9, by *Lena Dal Pozzo*, presents three studies concerning the syntax of pronominal subjects and the resolution of ambiguous anaphoric dependencies in the adult L2 acquisition of Finnish. Finnish is a partial null subject language, allowing first and second person null subjects but not third

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[34] In Romanian the position of the object clitic is conditioned by gender. Assuming gender to be a lexical feature, the syntax - lexicon interface is involved in Romanian clitic constructions.

person null subjects.[35] In answers requiring the identification of the subject (i.e. when the subject is a new information focus), null subject languages can adopt a VS strategy, which is not allowed in non- null subject languages.[36] Different strategies to new- information focalize a subject are adopted in non- null subject languages, such as SV or clefts. The first study reported in Chapter 9 investigates answering strategies in adult L1 and L2 speakers of Finnish. SV was the prevailing strategy in both groups, (though L1 speakers of Finnish also adopted other strategies , such as e.g. XPVS and clefts, not resorted to by L2 speakers) suggesting a pattern akin to non-null subject languages. No sign of transfer from the L1 is attested in L2ers. A second study was then designed to test the hypothesis that L2ers could have assimilated Finnish to a non – null subject language. A Picture Description Task (requiring oral as well as written production) was administered to L2 Finnish adult speakers with various L1s, to elicit first and second person subjects (which, as we said, can be null in Finnish). Results show that in oral production overt forms are more extensively produced, while in written production null forms are more attested, both by the experimental subjects and by controls, i.e. L1 speakers of Finnish. This reflects, the author argues, an ongoing change in colloquial Finnish, where an extensive use of overt pronominal forms is attested. L2ers are thus successfully facing the complex task of computing two different varieties of Finnish with different morpho-syntactic properties. In the third study, the interpretation of the personal pronoun *hän* 's/he' and of the demonstrative pronoun *tämä* 'this' in L2 Finnish are tested through an off – line Picture Verification Task. Results indicate that L2ers show a strong preference for *tämä* to be co-referent with the object of the main clause and a fluctuation for *hän* to be co-referent with the subject or the object of the main clause. The same pattern is observed in the control group, contradicting the results of Kaiser and Trueswell (2008), where *hän* is shown to refer to the subject of the main clause.

The results of the three studies suggest that in the complex domain of pronominal reference, a domain at the syntax – pragmatics interface, L2ers show patterns similar to those of L1ers, reflecting a tendency in the oral variety to treat Finnish as a non- *pro* drop language. L2ers differ from native speakers in that they only adopt the less complex possibility, among the different possibilities offered by the language they are acquiring.

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[35] Except in some embedded clauses and with weather verbs. See examples (2.a) and (2.b) in Chapter 9.
[36] Under the analysis of Belletti (2001, 2004) in a null subject language the subject can occupy a new information focus position in the vP periphery, *pro* occupying the high subject position in the clausal architecture.

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