The layered syntactic structure of the complementizer system: functional heads and multiple movements in the early left-periphery. A corpus study on Italian

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1. Introduction

Looking at children's spontaneous productions, a quick albeit gradual development can be easily observed in the morpho-syntactic complexity of their early sentences. Between the second and the third year, moving from the very first constructions in the two-word stage, children steadily advance through more articulated sequences that step-by-step converge on the adult grammar. Characterizing this process has been a major goal of research in language acquisition, a goal which necessarily calls for a constant interaction between developmental psychology and linguistic theory.

This exchange has proved to be useful in many ways, including the characterization of the early inflectional system. A telling example comes from much work, begun during the 90's, on the relation between verbal morphology and word-order. Language after language, it was found that from early on there is a tight link between the position of the verb and its inflection. Just to mention some observations, it was found that French-speaking children systematically vary the verb's placement depending on finiteness, so to match the adult distribution: Pierce (1992) showed that, whereas finite forms precede the negation marker *pas*, non-finite forms follow it. Similarly, a strong correlation between morphology and clausal position was also found in the productions of young German-speaking children, with the V2 position selectively used for finite verbs only (Verrips & Weissenborn 1992, Poeppel & Wexler 1993).

These lines of research were inspired by developments in linguistic theory which, shortly before, had offered a natural explanation of such correlations. From the seminal work of Pollock (1989), morphosyntactic features have been associated with independent syntactic projections, strictly ordered. Therefore, the syntactic features encoded in the verbal morphology can be checked through head-movement of the verb. This captures the observed link between word-order and inflection, both in adult and early grammars. Later on, Pollock's approach was developed and systematized in a line of research which eventually led to Cinque's (1999) comprehensive cartographic analysis of the structure of the IP.

In parallel, a richly structured hierarchical configuration has also been proposed to capture the higher portion of the clause. As the Inflectional system can be seen as a multi-layered zone of ordered projections, also the Complementizer system can be "split" into an articulated set of projections, each with its own well-defined properties. The gain has been then comparable with the Split-IP proposal, with advances on the word-order properties of the elements of the complementizer system, and on the study of the interfaces with sound and meaning of various left-peripheral constructions.

According to the Split-CP proposal initially presented in Rizzi (1997), the complementizer can be viewed as a syntactic space delimited by Force and Finiteness (Fin), including various positions dedicated to expressing particular scope-discourse properties: the scope of operators of different kinds (interrogative, relative, exclamative, etc.), discourse-related articulations such as topic–comment and focus–presupposition, the position occupied by highlighted adverbials, etc... All these projections must respect some ordering constraints, attested cross-linguistically, that can be captured by cartographic representations.

A layered CP-System offers a more articulated structure in comparison with traditional representations involving a single C-position. Much as the adoption of an articulated structure of the IP-system led to many fundamental observations on the properties of early clauses, also the articulated structure of the complementizer has the potential to reveal important characteristics of children's first utterances.

In this paper, our major goal is to document the development of the CP-system in Italian. A natural starting point in this direction is to consider the appearance of the various complementizer particles in children's first productions. Since they instantiate the heads of different left-peripheral projections, their occurrence provides an important landmark that could inform us about the initial skeleton of the CP in young children.

The structural positions of the Italian complementizer particles in the adult language can be illustrated by looking at their order in relation to topics, starting from the finite complementizer *che* ("that"). This element can be used to introduce both relative clauses and complement clauses and it arguably sits in ForceP, the highest position within the CP field, as confirmed by the fact that it can only precede (2a) but cannot be preceded by a topic (2b):

(2)a. Ho   saputo <u>che</u> [^{TOP}quel programma] l'hai   visto   *che* > topic
      have.1sg   known that   that program   it-have.2sg   seen
      "I know that you saw that program"

   b. * Ho saputo [^{TOP}quel programma] <u>che</u> l'hai visto   * topic > *che*

A lower structural position is instead occupied by the particle *se* ("if"). It is used to introduce conditional clauses and indirect yes/no interrogatives. Considering these latter, it sits in an intermediate position within the CP-System and it can be either preceded (3b) or followed (3a) by a topicalized constituent:

(3)   a. Mi domando <u>se</u>   [^{TOP} quel programma] tu l'abbia visto   *se* > topic
       I-wonder   whether   that program   you it-have seen
       "I wonder whether you saw that program"

      b. Mi domando [^{TOP} quel programma] <u>se</u>   tu l'abbia visto   topic > *se*
       I-wonder   that program   whether   you it-have seen
       "I wonder whether you saw that program"

Finally, the last particle worth considering is the non-finite complementizer *di* (homophonous to preposition *di* "of"). , which marks the low edge of the CP-System in

control constructions. In this position, FinP, it can only be preceded by topics, as shown by the contrast in grammaticality between (4a) and (4b):

(4) a. Penso   [^{TOP} quel programma] <u>di</u> vederlo   topic > *di*
        think.1sg   that program   to see-it
        "I think I'm going to see that program"

 b. *Penso   <u>di</u> [^{TOP} quel programma] vederlo   * *di* > topic
       think.1sg to   that program   see-it

On the basis of these and other considerations (see Rizzi & Bocci 2017 for an overview), the three particles can be considered as the heads of three distinct projections, as in the representation below:

 (5) Force > Top > Int > Top > Q/Foc > Fin > IP
     che   *se*   *di*

Representation (5) also includes the landing site of wh-movement, designated by Q/Foc. This notation captures the fact that in Italian main clauses wh-movement and left-peripheral focus movement compete for the same position (see Bocci, Rizzi, Saito 2018 for discussion).[1]

Currently, less is known about the emergence of these particles in early Italian and a corpus analysis could help us determining if they all appear within the same temporal window or if, instead, there is a different timeline characterizing each one.

The potential of adopting a layered CP-structure was already appreciated in a corpus study reported in Mastropavlou & Tsimpli (2011), where the refined representation of the Greek CP proposed in Roussou (2000) was combined with a typology of traits (Tsimpli and Stavrakaki, 1999) distinguishing between interpretable and uninterpretable features in the sense of Chomsky (1995). Mastropavlou & Tsimpli were primarily interested in the emergence of complementation in children with Developmental Language Disorder. However, data from a control group of Typically Developing (TD) children was also discussed. Spontaneous production for the TD controls covered a single time-window above age 3, spanning over a short 2-months interval. By looking at this brief interval, Mastropavlou & Tsimpli showed that, by and large, TD children were already able to use the complete array of complementizers found in the adult language. This led to the conclusion that 3-year-olds can correctly use and alternate the various CP particles, in accordance with their appropriate grammatical function.

In view of this result and in order to document the gradual appearance of the complementizer particles while it might still be in progress, we believe it will be instructive to closely focus on an earlier period. Our corpus analysis will therefore be based on a longitudinal corpus with regular samples taken between age 1;5 and 3;5.

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[1] The map differs from the map in Rizzi & Bocci (2017) in that it does not specify the very low (post-focal) topic position, a marked position which Italian permits, but which will not play a role in our analysis since it is typically observed following correctively-focused fronted constituents, unattested in early spontaneous speech. Our analysis also does not include the position Mod in the lower part of the left-periphery, dedicated to attracting highlighted adverbials.

In this time-window, soon after age 2, children's first forms of adult-like embedding are documented, perhaps preceded by a short preparatory stage in which sequences of clauses resemble a matrix/embedded relation without an overt complementizers (eg. "*do you see*" [~~that~~] "*he is playing*"). This *"preconjunctional stage"* (Penner & Mueller, 1992) has been occasionally reported across languages (Hebrew, Armon-Lotem 1997; Italian, Cipriani Bottari Chilosi Pfanner 1998; Greek, Mastropavlu & Tsimpli 2011). However, the status of these constructions remains elusive and they are also rapidly followed by the appearance of overt complementizers. We start from here, focusing on the first emergence of the full-fledged forms of embedding, introduced by overt particles. Moving on this firmer ground, we used a systematic semi-automated search to isolate all subordinate clauses in the spontaneous speech of 11 Italian-speaking children, so to establish the timing in which the different types of embedding appear.

Looking at English, Bloom et al. (1980) and Bowerman (1979) have observed that complement clauses seem to precede adverbial and relative clauses. However, the inverse order has been reported in Swiss German by Penner (1995) and in Hebrew by Armon-Lotem (2005). It has to be noticed, however, that if an advantage for relative clauses exists, it does not last long. Armon-Lotem, for example, reported the first occurrence of relatives in the Lior corpus at 2;1 followed by complement clauses only a month later at 2;2. In general, when the age of first-occurrence of the different types of subordination is considered, previous studies report a mixed pattern, with very brief time-differences that go in one direction or the other. As for Italian, there are no available data supporting a different course of acquisition for the two types of embedding. Interestingly, both relatives and complement clauses are introduced by the finite complementizer *che.* Thus, documenting the use of this particle could add some additional evidence in favour – or against – the idea that the two constructions develop at a different pace.

We also extend the corpus analysis in a second direction, looking at sentences with left-dislocated constituents that occupy the specifier of Top and the Q/Foc projections in the adult CP-System, represented in (5). To illustrate, consider the position of the direct object *"the documentary"* in the following sentences. In (6), a simple declarative sentence, the object occupies its canonical post-verbal position:

(6) I ragazzi guardano   <u>il documentario</u>   SVO
    the boys watch.3pl the documentary
    "the boys watch the documentary"

From its base position, the direct object could be moved to the Q/Foc projection, as in wh-questions (7) or in constructions expressing corrective focus (8):

(7) <u>Cosa</u> guardano   i   ragazzi? O_QVS
     What watch.3pl the boys
     "What do the boys watch?"

(8) <u>IL DOCUMENTARIO</u> guardano   i ragazzi   (non il film) O_{Foc}VS
    the documentary   watch.3pl   the boys   (not the movie)
    "the boys watch the documentary"   (not the movie)

A further possibility is to dislocate the direct object to a Topic position, in this case also accompanying it with a co-referring clitic (9)

(9) <u>Il documentario</u>   lo guardano   i   ragazzi   O$_{Top}$ cl VS
    the documentary   it   watch.3pl   the boys
    "the boys watch the documentary"

Since the different movement types illustrated in (7-8) and (9) trigger different syntactic positions, multiple movements to the left-periphery are also possible. For example, sentences (10) and (11) are perfectly grammatical in Italian: in both, a subject dislocated in a topic position precedes the direct object in Q/FocP, regardless of whether this latter is a wh-pronoun or a (correctively) focused DP:

(10) i ragazzi, cosa guardano?   S$_{Top}$ O$_Q$ V
    the boys what watch.3pl
    "what do the boys watch?"

(11) i ragazzi IL DOCUMENTARIO guardano   (non il film)   S $_{Top}$ O$_{FOC}$ V
    the boys the documentary   watch.3pl   (not the movie)
    "the boys watch the documentary"   (not the movie)

From the point of view of language acquisition, sentences like (10) or (11) would be very informative on the structure of the early CP. In fact, if attested, they would constitute the most direct evidence in favour of the emergence of a layered CP.

 No example of the kind of (10) and (11) has ever been reported for Italian, but the importance of these constructions was already noticed in Soares (2006) in her corpus study on European Portuguese. Looking at the spontaneous production of three children, she found the occurrence of some sentences similar to (10), in which a left-dislocated topic preceded the wh-constituent. Although the majority of these examples were found in the speech of children already in their fourth year, a few were also found in younger children between 1;10 and 2;2. To date, however, the examples reported in Soares are still an isolated case and, to the best of our knowledge, other examples of multiple A'-movements in the early left-periphery have not been reported elsewhere in other Romance varieties.

For what concerns constructions of the kind of (11) with a pre-focal topic, to the best of our knowledge, they are unattested in early spontaneous production. These structures have been experimentally investigated only in older children by Moscati et al. (2016) and only with respect to possibly ambiguous strings with two sentence-initial nominal constituents. The investigation of constructions like (11) could be hardly carried out by looking at the natural spontaneous production, since the use of the left-peripheral focus position is highly restricted in Standard Italian and it is only used in very special contexts, to express corrective and mirative focus (Bianchi, Bocci & Cruschina, 2016). In light of this consideration, we do not expect the constructions in (11) to be attested in a natural production corpus of young children. We therefore will focus on examples similar to (10), with a wh- preceded by a left-dislocated topic. They are more likely to occur in spontaneous production, also considering that they have been already observed in European Portuguese. We will then try to strengthen and possibly extend to Italian the initial observation made by Soares.

This issue of movement into the left-periphery also intertwines with other considerations about core cases of wh-movement. Following Rizzi (1996, 1997), Wh-movement in matrix clauses needs to satisfy an additional requirement that forces a local Spec-head relation between the wh-element and the inflected verb, a requirement called "the Wh-Criterion" in the reference quoted (and the Q-Criterion in later work). In that approach, the wh-element carrying the Q feature must enter into a Spec-head relation with a verbal head sharing the same feature. This enforces I to C movement in questions. This requirement has the consequence that an overt subject cannot intervene between the wh-element and the inflected verb, as shown by (12): it must be post-verbal as in (13) or topicalized, as in the previous example in (10)

(12) *Cosa i ragazzi vedono? O_Q SV
      what the boys watch

(13) Cosa vedono i ragazzi? O_Q VS
    what watch the boys
    "What do the boys watch?"

Looking at acquisition, the question arises of whether children adhere to the Q-Criterion from early on, excluding the presence of an intervening constituent in general, and the subject in particular, between the wh- and the finite verb/auxiliary. In this respect, a further important refinement has to be made, since not all Wh-elements end up in the position requiring I to C movement. Other elements, like *Perché* (Why) in matrix clauses, are base generated in Spec/IntP, a head which presumably is inherently endowed with the feature +Q, hence the satisfaction of the Q-Criterion does not require movement of the inflected verb, so that the subject (or other material) can occur in between (see Rizzi 2001 and much subsequent work for analysis of this pattern, and Thornton 2008 for evidence that some children acquiring English go through an "Italian" stage, in this respect, not requiring inversion with *why* questions). The grammaticality of both (14) and (15) with and without a preverbal subject illustrates this point:

(14) Perchè i ragazzi partono così presto?   why S V
    why   the boys   leave   so early
    "Why do the boys leave so early?"

(15) Perchè partono così presto i ragazzi?   why V S
    why   leave   so   early the boys
    "Why do the boys leave so early?"

An asymmetry between (12-13) and (14-15) has been already documented in Guasti (2000) by analysing the transcription of 5 Italian-speaking children. We will extend here the observation to a larger corpus, including 6 other children (Camilla, Rosa, Francesco, Elisa, Gregorio and Marco) and look for potential violations to the Q-Criterion. The absence of the ungrammatical construction in (13), together with the alternation in (14-15) would be telling about the early left-periphery: if children at age 2 already hypothesized its articulated structure with distinct positions for IntP and

Q/FocP (we will continue to use this label to refer to the landing site of regular wh-movement), we predict that they will require inversion, but in a selective manner: inversion will be only found for wh-constituents that sits in Q/Foc, but not with *why* questions.

2. A Corpus study

In the previous sections, we introduced a series of issues whose investigation could shed some light not only on the articulation of the CP-System in young speakers of Italian, but also more in general on the development of the higher functional spine of the clauses. We believe that some of these questions can be addressed through a systematic analysis of spontaneous productions, on the basis of the corpus resources currently available.

As we pointed out in the introduction, a first description of the early CP must include particles that are used to convey one of its primary functions: clausal embedding. Summing up the previous discussion, a corpus analysis could help us answering the two following questions:

(16)   a. When are various complementizer particles attested in early production? In particular, is there any developmental sequence in the appearance of *che, se* and *di* in Italian?

b. If the same complementizer form can introduce different types of subordination (e.g. relatives and complement clauses), is there any stable ordering in their sequence of appearance?

Turning instead to structures that would require movement of constituents into left-peripheral positions, they could add evidence in favour of a layered CP-system. In particular, we will look at whether the early CP provides a syntactic space with more than one position. If this is the case, we expect not only that multiple dislocations are possible, but also that I-to-C verb movement will obey the specific syntactic requirements enforced by different functional projections. This can be summed up in two additional research questions:

(17)   a. Are sentences with multiple movements (e.g. topic + Wh-movement), allowed by the complex CP-space of adult Italian, also attested in early productions?

b. Does Wh-movement comply with the same requirements active in the adult grammar, resulting in the asymmetry in inversion between *why* and other wh-elements?

These questions will be framed within the functional hierarchy in (5) that describes the left-periphery of the target grammar[2]. Clearly, answering the questions in (16) and (17) would have implications for existing theories of clausal development. Discussing them is outside the purpose of this paper, which is essentially descriptive. We will only

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[2] In adult speakers the representation in (5) is revealed by sequences of contrasts in grammaticality, carefully assembled. Although judgments are sharp, as in the examples we reported in (2-4), sentences of this kind are infrequent also in adult production. Therefore, a direct comparison between the adult structure uncovered by target grammaticality judgments and the initial structure hypothesized by children would necessarily require a controlled experimental set up.

limit the discussion, at the very end of the paper, to a very recent proposal presented in Friedmann, Belletti & Rizzi (2020) whose main innovation with respect to the precursors is the crucial use of the cartographic representation in (5).

In order to answer to the questions in (16) and (17), we conducted a new corpus study looking at the transcriptions of the spontaneous productions of 11 Italian-speaking children available on CHILDES (MacWhinney 2000) for a total of 128 files. Overall, our corpus covers a timespan that stretches from 1;4 (Francesco) to 3;4 (Camilla). Depending on the number of files and the age of the child, the absolute size varies considerably from one corpus to the other. A general summary of the properties of the individual corpora is provided in Table 1. The summary includes the source, the name of the child, the age of the child in the first and in the last file, the total number of files and the size of each corpus calculated in terms of child utterances.

Table 1. General summary of the corpora.

Corpus	Child's name	Begin	End	# of files	Size (*CHI)
Antelmi	Camilla	2;2,06	3;4,09	7	1892
Calambrone	Diana	1;8,05	2;6,13	9	2196
Calambrone	Guglielmo	2;2,1	2;11,14	9	2209
Calambrone	Martina	1;7,18	2;7,15	16	4216
Calambrone	Raffaello	1;7,7	2;11,20	17	3750
Calambrone	Rosa	1;7,13	3;3,23	21	7409
Calambrone	Viola	1;11,16	2;10,3	10	2667
Roma	Francesco	1;4,03	1;8,17	10	1138
Tonelli	Elisa	1;10,04	2;1,23	8	1090
Tonelli	Gregorio	1;7,17	2;0,29	8	1121
Tonelli	Marco	1;5,04	2;5,24	19	6787

The corpus analysis was performed alternating automatic and manual searches in order to address the empirical questions presented in (16) and (17). Our departing point will be to look for the spontaneous production of the three different particles *che, di* and *se*. In the next section, we will consider them separately, also looking at the different types of embedding introduced by *che*. Results relative of the age of first occurrence of each particle will then be joined together in section 2.4, so to provide a comparative overview on the developmental course of the three particles. In section 3, we will then turn to the analysis of movement constructions, looking for examples of multiple movements in the left-periphery and also for potential violations to the Q-Criterion.

2.1. Complementizer particles in spontaneous productions

We will first consider children's production of the particles *che*, *di* and *se* that constitute the backbone of the CP-system. Our first step was to isolate children's use of each of these particles through an automated search using the *kwal* function on CLAN. Then, we manually went through the results and isolated all the occurrences in which *che*, *di*, *se* could be unambiguously classified as a complementizer particle. This allowed us to exclude other irrelevant forms, for example the homophonous preposition *di* and the 3rd person reflexive pronoun *se.* Finally, we further analysed the results in order to consider the type of embedding introduced by the different particles. We will present

the results by considering each particle in turn, beginning with the finite complementizer *che*.

2.1.1. First uses of the particle *che*

The particle *che* in Italian is a versatile functional head performing different roles and occurring in different positions in the map of the left-periphery (Rizzi 2013). Its core function may be identified in the expression of declarative force in embedded declarative clauses, but it also marks the CP-system of subject and object relatives, and of other kinds of main and embedded clauses. Given the versatility of the particle, we think it makes sense to study the acquisition of its core use in the context of the other early uses.

Our automatic search revealed 508 occurrences of *che* in children's speech. Of those, 106 occurrences were classified as *not-clear*. For what concerns the remaining 402 occurrences, we report their overall distribution over time. In order to capture the general longitudinal trend, we first divided the time-window covered by the 128 files in our corpus in 1-month intervals. Then, for each interval, we counted the total number of *che* produced by each child, excluding unclear cases. This procedure will be the same also for the other particles analysed later. Results are summarized in Table 2, in which grey cells indicate the months for which at least one file is available. Grey cells provide a quick visual indication about the period covered by the transcriptions for each child: for example, Francesco's recordings start very early: the first grey cell is at 16 months. His transcriptions also end before the others, with the last grey cell in correspondence of 20 months. When multiple recordings are taken within the same month, we collapsed the files together and report them within a single cell.

Table 2. Longitudinal production of *che* in children. Darker cell indicated months in which there is at least one file. White empty cells indicated months lacking any datapoint. Non-Clear cases are excluded.

Age in months	Children											Total
	Camilla	Diana	Elisa	Franc.	Greg.	Gugl.	Marco	Mart.	Raff.	Rosa	Viola	
16				0								0
17				0			0					0
18				0			0					0
19				0	0		0	0	0	1		1
20		0		0	0		0	0				0
21					1		2	1	0	0		4
22		2	9		0		1	0	0	0		13
23		0	19				1	0	1	1	0	22
24		8			2		5		0	0	0	15
25		3	30				4	2	0	0	0	39
26	5		4			12				1		22
27						3		6	0			9
28	9					0		2	0	30	1	42
29		12				1		2	0	1	6	22
30	13	29							2	1		45
31						5		2	0	0	0	7
32									4		1	5

33	7					8			3	1		19
34						1				2	3	6
35	15					20			8	29		72
36										3		3
37	11									2		13
38												
39										10		10
40	34											34
tot	94	54	62	0	3	50	13	15	18	82	11	402

Looking at the production of the particle *che*, Table 2 shows that all children, with the sole exception of Francesco, use it. The absence of *che* in Francesco's transcription is most likely due to the fact that his recordings end much earlier than the others. For what concerns the remaining children, the table shows that in the initial period, the one between 16-20 months, the occurrences of *che* are scarce, with only a single occurrence over 16 files, found in Rosa's transcriptions. From months 21 to 26, instead, most children start producing the particle and by month 28 it is attested in the speech of all children, with the exclusion of Francesco for the reasons already discussed. It is also worth noticing that most of the transcriptions end at month 35, with the sole exception of Rosa and Camilla. Therefore, data in the time interval 36-40 months became more scattered, as shown by the paucity of the grey cells.

To further facilitate the visual inspection on the individual production of the particle *che* we graphically summarized in Figure 1 the longitudinal trend for each child, excluding Francesco. From the figure, it emerges quite clearly that at around the onset of the second year most children start using this particle. Fluctuations in the absolute number of particles produced, most evident in the two peaks observable in Rosa's transcriptions, may depend on the size of the single recording sessions and on the granularity of the sampling, that may vary from child to child and from one month to the other.
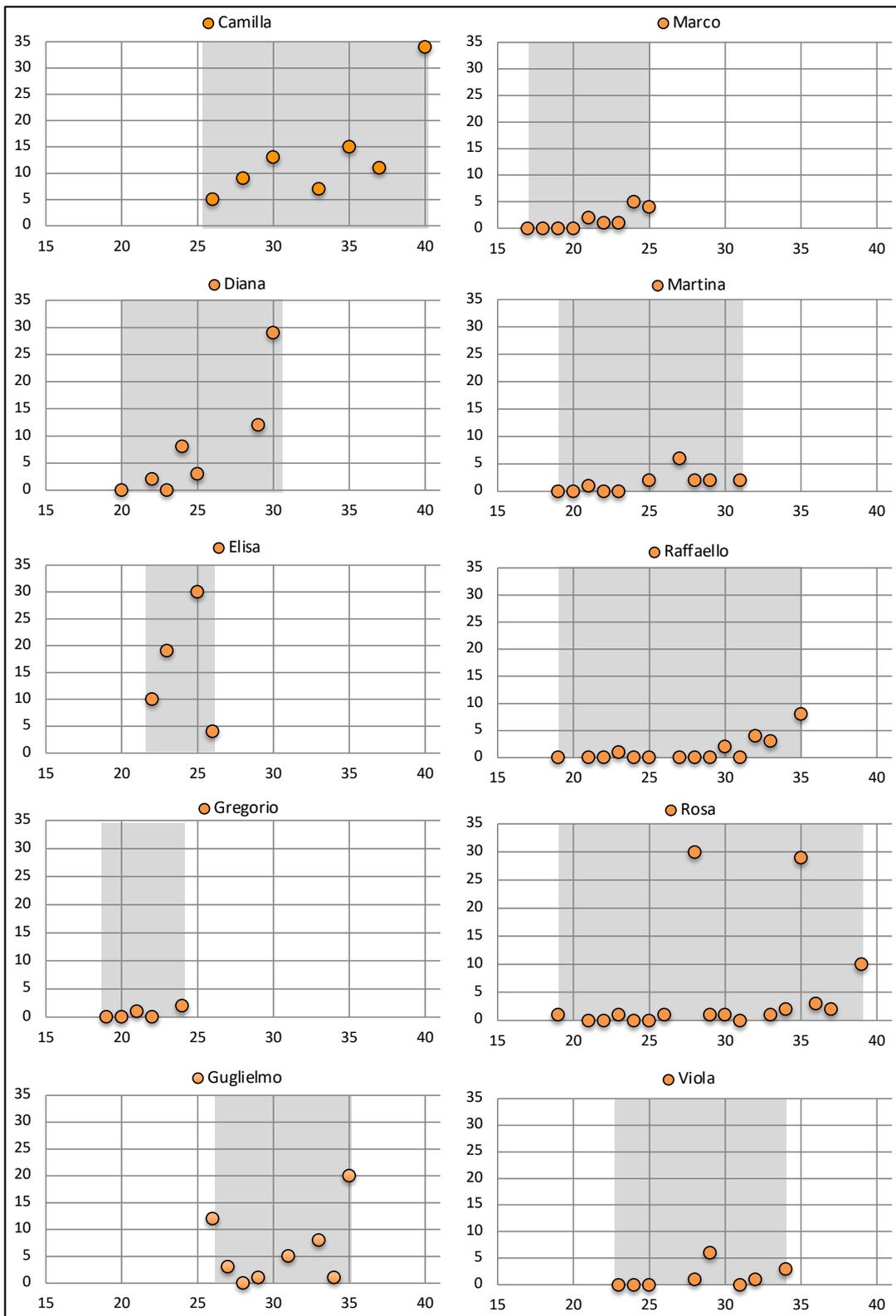
Figure 1. Number of particles *"che"* montly attested in spontaneous production for each child in the corpus. The X-axis reports the age in months, grey areas represent the period covered by individual transcriptions.

The fact that at around their second year children start to use the particle *che* become also evident if we try to normalize the count in function of the total size of the transcriptions available for each month, and aggregate data of all children together. The aggregate longitudinal ratio *che*/number of words is plotted in Figure 2. Although fluctuations due to the available samples are still there, evident in the "gap" at month 38, the plot also indicates that *che* becomes increasingly frequent between month 21 and 26, where the corpus reaches its maximal density.
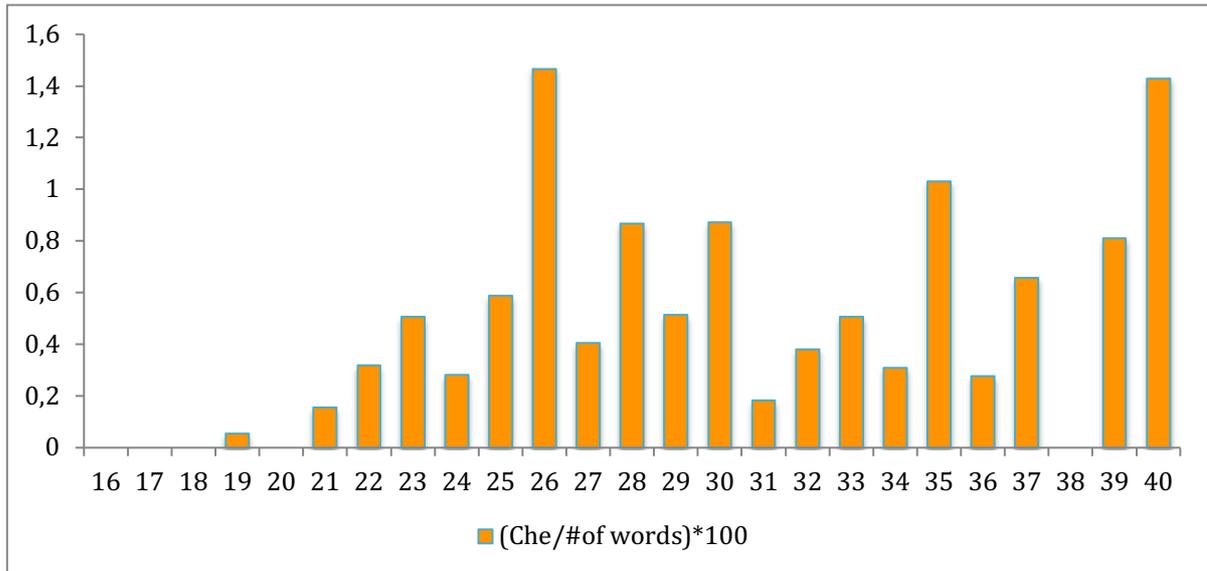
Figure 2. Ratio of the particle *che* over the total number of words uttered per month.

Summarizing the results of this preliminary overview, it seems that by the middle of their second year Italian children have already begun to produce the complementizer *che*, a prerequisite for the emergence of adult-like forms of embedding. Since this particle may serve to a number of syntactic functions, not all related to subordination, a more fine-grained analysis is needed. We then went through each single instance and determined its syntactic function, so to compare the incidence of each grammatical structure and the age of their first appearance.

2.1.2. Clausal embedding introduced by the finite complementizer *che*

As a second step, we manually analysed and classified each instance of *che*. Excluding the 106 unclear cases, all the remaining 402 were labelled according to 8 categories. We will briefly illustrate them in (18) below, using some real examples found in our corpus.

(18)   a. Object relative
        Voglio il gioco che ha comprato il papà   (Camilla 2;09)
        want   the toy that has bought the daddy
         "I want the toy that daddy bought"

b. Subject relative
I bimbi che   sono bagnati   (Elisa 1;11)
the kids that are   wet
"The kids that are wet"

c. Complement clause
lo sai   che ti   ho   comprato un regalo   (Elisa 2;1)
it know that to.you   have   bought   a   present
"You know that I bought you a present"

d. Causal/consecutive clause
Me   lo metti in bocca che altrimenti bisogna tagliare la pancia (Elisa 2;1.20)
to.me it   put   in mouth that otherwise need   cut   the belly
"You put it in my mouth, otherwise we need to cut the belly"

e. Cleft
E' il filo che tira   (Guglielmo 2;7)
is the thread that pulls
"It is the thread that pulls"

f. Polar exclamative
Sì   che   lo sai   (Camilla 2;6)
yes that it know
"Yes, you know it!"

g. Exclamative
Che bella !   (Diana 2;0)
that nice
"So nice!"

h. Wh-Interrogative
Che sono?   (Guglielmo 2;7)
what are
"What are they?"

Consider first the examples in 18 (a-d). In these constructions the *che* particle clearly introduces a subordinate clause: subject or object relatives (18a-b), a complement clause (18c) or an adjunct in the form of a causal/consecutive clause (18d).

The categories in 18 (e-h) have been instead used to classify other uses of *che* that cannot be immediately reduced to clausal embedding. Sentence (18e) is the only cleft found in our corpus, so that, whether or not we consider clefts as illustrating a special case of subordination, this single example will not have an impact on the general result. (18f) and (18g) illustrate two different cases of exclamatives, where the particle *che* can be either preceded by a polar element (*si* 'yes' or *no)* as in (18f) or be in sentence-initial position as in (18g). The two cases obviously differ in that *che* clearly is a C-particle in (18f), whereas it is a DP-internal wh-specifier of the exclamative phrase in (18g). Although a bi-clausal analysis is plausible for some of the constructions in (18 e-f) (cleft: Belletti 2015; polar exclamatives, Poletto & Zanuttini 1993), they should be kept separate from the very clear cases of matrix/embedded subordination given in

(18 a-d). Finally, we also isolated sentences in which *che* is equivalent to *che cosa* exclamatives, *che* is a DP-internal specifier, not a head of the clausal spine.

The various uses of *che* attested for each child are reported in Table 3. Looking at the aggregated data, a first observation that can be made is that all children in our corpus use *che* to introduce subordinate clauses, with the sole exceptions of Francesco and Gregorio, whose transcriptions end too early, and Viola. Of these subordinate clauses, in 12.9% of cases *che* is used with embedded complement clauses. Subject and object relatives cover instead respectively 21.0% and 5.0%, with an additional 10.9% of causal/consecutive adjunct clauses.

Table 3. Number of occurrences of *che* for each syntactic category per child and their aggregated proportion on total.

Child	SR	OR	Compl.	Causal	Cleft	Polar Excl.	Excl.	wh-int	Tot
Camilla	29	8	17	11	0	11	5	13	94
Diana	7	4	5	7	0	7	13	11	54
Elisa	10	2	15	18	0	6	10	1	63
Francesco	0	0	0	0	0	0	0	0	0
Gregorio	0	0	0	0	0	0	3	0	3
Guglielmo	14	1	11	1	1	0	5	17	50
Marco	5	1	1	0	0	0	2	4	13
Martina	2	0	0	5	0	1	5	2	15
Raffaello	11	2	1	0	0	0	1	3	18
Rosa	7	2	2	2	0	0	2	67	82
Viola	0	0	0	0	0	0	8	3	11
Total	**85**	**20**	**52**	**44**	**1**	**25**	**54**	**121**	**402**
% on Total	**21.0**	**5.0**	**12.9**	**10.9**	**0.2**	**6.2**	**13.4**	**30.1**	

This distribution confirms that in about half of the cases, children use the particle *che* to introduce a finite subordinate clause. Therefore, in their third year of life, Italian children already make use of clausal embedding, correctly introducing them by means of the finite complementizer *che*.

We are now in the position to address one of our initial questions: is there any important difference in the time of appearance of relative clauses (18a-b) with respect to complement clauses (18c-d)? In order to answer it, we further examined the transcriptions looking for the first occurrence of each type of embedding. Results are reported in Table 4, with the age of first appearance indicated in months.

Table 4. First occurrence of *che* indicated in months, for the various sentence types.

Child	Type of Subordination				Pattern
	SR	OR	complement	causal	
Diana	22	29	29	25	A. Rel > Complement
Guglielmo	31	26	34	35	
Marco	24	24	25	-	
Rosa	36	33	39	39	
Camilla	29	28	28	-	B. Rel = Complement
Raffaello	32	33	32	-	
Martina	27	-	-	27	
Elisa	23	25	22	-	C. Complement > Rel
Francesco	-	-	-	-	n.a.
Gregorio	-	-	-	-	
Viola	-	-	-	-	

By looking at the first occurrences of the different types of subordinate clauses, Table 4 reveals that children do not conform to a single homogeneous pattern. Four children, namely Diana, Guglielmo, Marco, Rosa, produced their first relative clause before a complement/causal clause. In two of them, Guglielmo and Rosa, an object relative was the first type of embedding. The opposite pattern, with a complement clause found before the first relative, was attested in the transcriptions of one child, Elisa. In the other three children, Camilla, Raffaello and Martina, the two types of embedding appeared at the same time. The remaining children did not produce any subordinate clause in the available time-window, therefore they do not provide any datapoint.

In conclusion, there seems to be no uniformity across children in the order of first appearance and only a slight advantage of relatives over complement clauses can be observed in a subset of the transcriptions. The two types of embedding seem to blossom nearly together, suggesting that they could both appear as soon as the topmost functional projection, in this case ForceP, becomes available. The weak advantage of relatives could be due to their more free distribution, since their CP needs not to encode grammatical traits specified by the embedding matrix verb, as suggested in Penner (1995).

2.2. the particle *di*
We now turn to the complementizer *di* that occupies the lowest projection within the CP-system. This particle is at the nexus between the CP- and the IP-system and it introduces a non-finite control clause. In order to isolate it, we adopted the same procedure used with *che*: first, we ran an automatic search using the *kwal* command in CLAN and then we manually went through the occurrences to exclude the homophonous preposition *di.* Our search revealed that the use of *di* is much more limited than *che*, a fact that is not surprising given that its distribution is significantly more restricted, as it introduces only certain non-finite control clauses. 19 instances were found over 128 files, and they were all confined to the transcriptions of 5 children: Camilla, Diana, Elisa, Guglielmo and Marco. We report a few examples below:

(19)   a. Dice a sorellina   di saltare sull' elefante   (Camilla 2;9)
         say to little-sister to jump   on-the elephant
        "He says to the little sister to jump on the elephant"

b. T'　　　ho　　detto di no di giocare　　　(Diana 2;6)
　　to-you　have　said　to no to play
　　"I said you not to play"

c. Quando ho　finito　　di mangiare　　　(Elisa 2;1)
　　when　have finish　　to eat
　　"When I finish eating"

d. Dice il　papà　　di mettere per terra　　　　(Marco 2;1)
　　say the daddy　to　lay　　on　ground
　　"Daddy says to lay it on the ground"

Again, to document the longitudinal trend, we divided the temporal continuum into 1-month intervals and report the occurrences for each child in Table 5 below.

Age in months	Children											tot.
	Camilla	Diana	Elisa	Franc.	Gregorio	Gugl.	Marco	Martina	Raff.	Rosa	Viola	
16				0								0
17				0			0					0
18				0			0					0
19				0	0		0	0	0	0		0
20		0		0	0		0	0				0
21					0		0	0	0	0		0
22		0	0		0		0	0	0	0		0
23		0	1		0		0	0	0	0	0	1
24		0			0		0		0	0	0	0
25		0	3				2	0	0	0	0	5
26	0		0			0				0		0
27						0		0	0			0
28	1					0		0	0	0	0	1
29		0				0		0	0	0	0	0
30	0	2							0	0		2
31						1		0	0	0	0	1
32									0		0	0
33	3					0			0	0		3
34						0				0	0	0
35	2					0			0	0		2
36										0		0
37	2									0		2
38												0
39										0		0
40	2											2
tot	10	2	4	0	0	1	2	0	0	0	0	19

Table 5. Longitudinal production of the non-finite complementizer *di* in children. Darker cell indicated months in which there is at least one file. White empty cells indicated months lacking any datapoint. Non-Clear cases are excluded.

The results of this search show that the occurrences of *di* are rarer if compared with the early occurrences of *che*. At the same time, they also show that some children already use non-finite control clauses introduced by *di* around, or shortly after, their second birthday as we observed for the use finite subordination.

2.3. The particle *se*

The third complementizer we considered is the particle *se* used to introduce indirect yes/no questions and conditional clauses. As with the other particles *che* and *di*, we ran an automated search in CLAN and then we looked over the results to manually exclude occurrences of pronominal *se*. In total, our search produced 40 instances of *se* used as a complementizer. 15 other cases were excluded, since they were unclear. Again, the longitudinal prospect of individual productions is rendered in Table 6.

Table 6. Longitudinal production of the complementizer *se* in children. Darker cell indicated months in which there is at least one file. White empty cells indicated months lacking any datapoint. Non-Clear cases are excluded.

Age in months	Children											total
	Camilla	Diana	Elisa	Franc.	Greg.	Gugl.	Marco	Mart.	Raff.	Rosa	Viola	
16												
17												
18												
19												
20												
21												
22												
23			1									1
24												
25			1				1				2	4
26	1											1
27												
28	2											2
29												
30	0	7										7
31						3						3
32												
33	0											
34						1				1		2
35	2					1			9	1		13
36												
37										2		2
38												
39										1		1
40	4											4
tot	9	7	2	0	0	5	1	0	9	5	2	40

The table above shows that the majority of children start using the particle *se* within the time-window covered by the transcriptions. The usual exceptions were Francesco and Gregorio because of their shorter and earlier recordings, and Martina. The earliest

occurrence of *se* is found in Elisa's transcriptions, at 23 months. Notably, in the short time-window between 22 and 23 months, Elisa already presents the whole array of complementizer's particle, all appearing together around the same time. In the other children, this particle appears before the third year: in fact, before 35 months, they all have produced at least one instance of *se.* We report below a few examples, showing the early use of *se* introducing different types of subordinate clauses, namely embedded interrogatives and conditionals.

(20) a. Embedded Interrogative
        Vediamo se c'   è   (Camilla 3;4)
        look   if there is
      "Let's look if there is"

        b. Embedded Conditionals
          Se te   lo metti in bocca, affoghi   (Guglielmo 2;10)
          if to.you it put   in mouth choke
        "If you put it in you mouth, you'll choke"

        c. Negative Conditionals   ʿse noʾ
          Perchè   se no   non vanno .   (Raffaello 2;11)
          because   if no   not go
        "Otherwise they won't go"

We found 4 embedded interrogatives (20a), 19 conditionals (20b) and 17 conditional expressions in the form of "se no" (20c).

At this point, having determined the onset of each particle, we can join together the results so to draw a first sketch of the development of the CP-System through the appearance of the heads of functional projections that permit clausal embedding.

2.4. A general overview: comparing the first uses of the complementizer particles.

Putting previous results together, we can try to address now our first question, concerning the timing when the particles *che, se* and *di,* that mark the fundamental skeleton of the CP, are attested in children's spontaneous speech. As a preliminary observation, our search revealed that between age 2 and 3 all CP-particles are already attested in many of the transcriptions: five children use the whole array of the Italian complementizers to introduce clausal embedding. Moreover, in all children, their productions conform to the adult grammar. No misuse of *che*, *se* or *di* was observed.

Turning now to the development of each particle and their first documented occurrences, the more limited distribution of the particles *se* and *di* in the adult grammar has to be considered. These two particles also occur less often than the complementizer *che* in children's productions. Therefore, being less frequent, they are also more likely to slip through the mesh of a sparse sampling. Conversely, the first occurrences of *che* have a higher probability to be captured. On the basis of merely frequency-based considerations alone, we could then expect that *che* will emerge earlier in the corpus analysis, since a comparison between the first attestation of the

three complementizers is strongly biased in favour of *che*. The pattern that we found, comparing and joining together the results presented in sections 3.1, 3.2. and 3.3 is not entirely consistent with this expectation. We visually illustrate it by reporting in figure 5 the age of first use of each particle. In the case of *che*, we only report occurrences in which it was used to introduce a subordinate structure. Figure 5 shows that only in the cases of Diana, Martina and Raffaello the particle *che* clearly precedes the other two and it is attested at least a full month earlier: in Diana, this particle preceded the other two of a few months; in Martina, it is the only one attested; in Raffaello it appears well before *se*, while *di* is still absent.

This trend, however, is not predominant across the transcriptions in our corpus. Figure 5 shows that in the majority of children the particle *che* either appears at almost the same time of one or both the other two particles (Elisa, Marco, Guglielmo, Rosa) or even later as in the case of Camilla and Viola (it is still absent in this latter child). Thus, despite the higher overall frequency of *che*, its advantage in terms of its first occurrence is rather weak and in four children, Elisa, Marco, Camilla and Guglielmo, the three particles appear at around the same time. In the case of Elisa, they all appear before the second year and all within a one-month interval, between 22 and 23 months. In Elisa's grammar, the CP-System thus stabilizes very early. Within the margins of individual variations, the same also happens in Marco, Camilla and Guglielmo, where we still observe the appearance of the three particles in a short time-interval. Raffaello and Rosa do not show any attested occurrence of *di*, but have *che* and *se* appearing in rapid sequence.
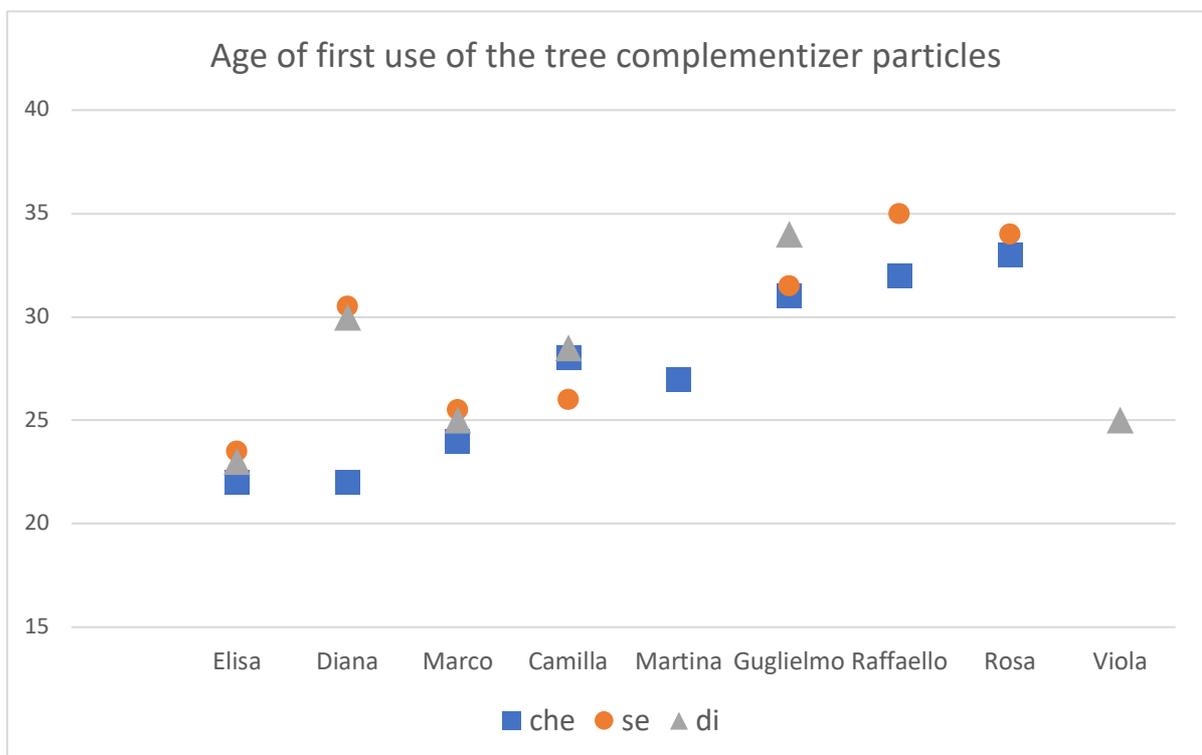
Figure 5. First use of *che*, *se* and *di* in the transcriptions of the 9 children with data available also after 24 months. y-axis represents the age in months.

The general consideration that our data suggest is that the temporal advantage of *che* over the other two particles is not generalized. This is consistent with the conclusion arrived at in Friedmann et al. (2020) on the acquisition of modern Hebrew, where

different types of clausal embedding are attested at once. Speculating on this observation, it is then possible that all forms of clausal embedding could be related to the emergence of a single property. In particular, the availability of the topmost clausal projection, ForceP, could provide the spark to the surge of embedded clauses of different kinds. Assuming that the selection of finite embedded clauses is categorially uniform and that all verbs selecting a finite complement select a ForceP under sisterhood (Chomsky 1965), all kinds of finite embedding would thus need to establish a link with the topmost projection ForceP, where the appropriate grammatical trait is encoded so to satisfy the requirements of the matrix embedding verb. The consequence of this is that also other types of embedded clauses, as the conditional clauses introduced by *se*, are only possible if ForceP is already available in the early clausal structure. Thus, we can consider the appearance of *che* as a signal that ForceP can be projected. From this moment on, other different types of embedded clauses would emergence concomitantly, or shortly after. We thus expect that *che* could either slightly precede *se* and *di* (with frequency being a confounding factor), or that the three particles become simultaneously accessible upon the availability of ForceP. We will go back to this at the end of the general discussion, when we will discuss the hypothesis that the clausal structure undergoes a stepwise maturational growth

3. Properties of movement in the extended left-periphery

Beside the functional projections that are headed by an overt particle, the extended CP of Italian also features a series of syntactic positions that can host A'-movement. Looking into these constructions could also provide important indications on the early structure of the CP-system. In what follows, we will examine in detail some properties of the Wh-questions attested in our corpus.

The first property we will consider is children's compliance with obligatory inversion, triggered by Wh-elements moved in the Q/FocP position. As discussed earlier, this operation is needed in order to satisfy the Q-Criterion, requiring a local spec-head configuration between the wh- and the verbal head. On the contrary, *why*-questions where the wh-element is base generated in IntP, do not require inversion (Rizzi 2001). The important consequence is that inversion is activated or not depending on the syntactic position of the Wh-constituent. Therefore, if children distinguish between positions requiring inversion (Q/Foc) vs positions which do not (IntP), we should find a difference in the rate of inversion between *why*-questions opposed to other wh-questions.

A second property that could be revealing about the stratification of the early CP-system is the possibility for multiple movements to the left-periphery. The structure of the Italian CP allows for the simultaneous occurrence of Wh- and topic movement, due to the availability of Topic projections above Q/FocP. In fact, sentences where a topic precedes a wh-pronoun are perfectly acceptable in the adult grammar of Italian and have also been reported in the spontaneous productions of the three European Portuguese children studied by Soares (eg. *O gato, onde está* "the cat, where is it?" Child Marta, p.290. Soares 2006).

In order to look for inversion and multiple movements, we are now primarily interested in sentences containing an interrogative pronoun. Therefore, we first isolated all the wh-sentences in our corpus. To do this, we ran an automated search

looking for Wh-pronouns in Italian (*cosa*, *chi*, *dove*, *quale*, *come*, *quando*, *quant-o,-e, -a, -i, perché*) and 955 wh-elements were isolated within the transcriptions of 10 children[3]. From those, 124 occurrences were unclear and excluded. Then, all the remaining 831 occurrences were manually examined and classified so as to distinguish between fragments, matrix and embedded questions. This latter class includes both i) full bi-clausal constructions with a subordinate clause embedded under an overt matrix and also ii) subordinate clauses uttered in isolation, without the matrix. A further class was also included to account for the occurrence of wh's in their non-interrogative, exclamative use. We used 6 categories in total, illustrating them as usual by reporting some real examples from our corpus.

(21)   a. Matrix Interrogative
        Chi l' ha fatto ?   (Elisa 1;10)
       who it has done
      "Who did it?"

       b. Matrix Exclamative
        Mamma mia come brucia !   (Diana 2;0)
        mother my how burns
      "Oh my God, so hot!"

      c. Embedded
        Guarda chi c' è ?   (Diana 2;5)
        look   who there is
      "Look who's here ?"

      d. Embedded exclamative
        Mamma guarda come sono grande !   (Guglielmo 2;10)
        mom   look how am   big
      "Mom, look how big I am!"

      e. Fragment
        Perché ?   (Marco 2;1)
      "Why?"

      f. Other
       # i figliolini   hanno la corona come questi   (Guglielmo 2;10)
        the little-sons have   the crown like these
      "The little sons have a crown, like these"

Clearly, the matrix wh's in (21a) are the most interesting construction to determine the subject-verb inversion rate. Looking at our corpus, the search confirmed that matrix

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[3] We excluded the files from Camilla. The reason is that we realized that in Camilla's transcriptions accented characters are not correctly encoded. Thus, for example, the 3rd person form of the verb "to be" *è* is substituted by the symbol #, which is used in the CHAT format to indicate pauses. This will be problematic once we look at the position of the Wh-element in relation to the finite verb or the auxiliary.

wh's interrogatives are very frequent at this age, with the highest numerosity among the other categories reported in Table 7[4].

Matrix Interr.	Matrix Excl.	Embedded	Embedded Excl.	Fragment	Other	Total
378	11	184	3	237	18	831

Table 7. Total number of wh-sentences classified for the categories in (21).

In order to be able to determine the rate of subject-verb inversion, we also needed to distinguish between the different types of wh-elements. Thus, we went through all 378 matrix wh-questions, classifying them according to the wh pronoun. We also kept occurrences of *che* and *chi* separate, depending on their grammatical function. Results are reported in Table 8 below.

Child	chi *who*			cosa *what*		come *how*	dove *where*	perchè *why*	quant- *how much*	quando *when*	tot
	subj	**obj**	**other**	**obj.**	**subj.**						
Diana	6	0	0	4	0	6	10	0	2	0	28
Elisa	4	0	2	5	1	9	9	4	1	1	36
Francesco											
Gregorio											
Guglielmo	13			9	1	5	15	40			83
Marco	27		1	9	3	3	20	2			65
Martina	3			2				2			7
Raffaello	7	2	3	19	2	2	5	2		3	45
Rosa	86	1		4	7	5	7	1			111
Viola	3										3
Tot.	**149**	**3**	**6**	**52**	**14**	**30**	**66**	**51**	**3**	**4**	**378**

Table 8. Matrix wh-questions. Summary for the different wh- pronouns.

At this point, with this general picture at hand, we can move on and consider inversion and multiple movements in turn.

3.1. Inversion and the Q-Criterion.
We will look first at children's sensitivity to the different positions of the interrogative pronoun, as it could be determined by looking at the inversion between the subject and the verb. As we said, a distinctive grammatical property of the wh-elements in Q/Foc is that they require an overt spec-head relation between the Wh- and finite verb/auxiliary. On the contrary, *why* questions behave differently since they do not

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[4] Matrix wh- appear generally earlier than full bi-clausal sentences. Examples like (21c) are attested only after matrix wh's. For instance, the first full form of embedded interrogative is found in Elisa's corpus at 1;11, when matrix wh's were already attested:

    i. *Adesso vediamo cosa fa* (Elisa 1;11)
     "now let's see what he does"

As in the case of lower CP heads, embedded wh's would also require a link to ForceP, so to satisfy C-selection.

trigger inversion. In fact, other constituents - including the subject-, are free to occur between *why* and the verb.

In order to analyse the rate of subject-verb inversion in questions, we further analysed our set of 378 matrix wh-questions. We filtered out subject wh-questions and, for the remaining ones, we isolated sentences that presented an overt subject. As a result, we obtained 69 wh-interrogatives in which the subject could potentially intervene between the Wh- and the verb, in violation of the Q-Criterion.
Then, for each interrogative pronoun, we counted the occurrences in which the subject actually intervened between the wh- and the finite verb/auxiliary. The results are illustrated in Table 9 below.

Child	Chi$_{Obj}$ "who"	Chi$_{Other}$ "who"	Come "how"	Cosa$_{Obj}$ "what"	Dove "where"	Quanto "how much"	Perchè "why"
DIANA			0/3	0/1	0/4		
ELISA			0/3	0/3	0/8	0/1	1/2
Francesco							
Gregorio							
Guglielmo			0/2	0/3	0/6		6/9
Marco		0/1	0/1	0/1	0/6		
Martina				0/2			
Raffaello	0/2		0/1	0/1	0/2		
Rosa	0/1		0/1	0/2	0/3		
Viola							
Total	**0/3 0%**	**0/1 0%**	**0/11 0%**	**0/13 0%**	**0/29 0%**	**0/1 0%**	**7/11 63.6%**

Table 9. Number of matrix wh-questions with an overt subject occurring between the interrogative pronoun and the verb.

Table 9 shows that in matrix wh-questions the subject never precedes the verb, with the exception of sentences with *perchè/why*. In fact, we found only 7 sentences in which the subject breaks in the Wh-/Verb cluster.[5] Importantly, they are all *why* questions and they constitute no violation of the Q-Criterion. All the examples, mostly found in Guglielmo's transcriptions, are reported below:

(22) Why-Questions
      a. Perché quelle non si   mettono l' ombrello in testa ?   (Elisa 1;11)
        why   those   not themselves put   the umbrella on head
        "Why don't they put the umbrella on their head?

---

[5] We found only a single example in which an argumental wh- does not immediately precedes the lexical verb:
(i) mette chi mamma ?   (Rosa 2;7)
    put   who mum
   "who does put it, mom?"
But this seems to be a subject question, with the wh-subject appearing *in situ* in the postverbal subject position, a non-target configuration in Italian. In any event, being it a subject question, this example is not relevant for determining the respect of the Q-criterion in child grammar.

b. Perché questi sono grandi ?   (Guglielmo 2;3)
   why   these are big
   "Why are they big?"

c. Perché Manuele è grande ?   (Guglielmo 2;7)
   why   Manuele is grown-up
   "Why is Manuel grown-up?"

d. Perché loro 'un ce l' hanno medaglietta ?   (Guglielmo 2;10)
   why they not cl it have medal
   "Why don't they have the medal?"

e. Perché lui non ce l' ha ?   (Guglielmo 2;10)
   why   he not cl it has
   "Why doesn't he have it?"

f. Perché lui sta dormendo via ?   (Guglielmo 2;10)
   why   he is   sleeping   away
   "Why is he sleeping away?"

g. Perché questo non ci vede gli occhi ?   (Guglielmo 2;10)
   why   this not cl see the eyes
   "Why doesn't he see (with) the eyes?"

The analysis of the subject/verb inversion rate thus shows very clearly that young children already differentiate between the properties of distinct wh-elements. We take this selective compliance to the Q-Criterion as a first indication that 2-year-olds are already sensitive to the syntactic requirements associated with the functional projections in the CP-system.

3.2. Multiple movements to the left-periphery: pre-focal topics
After isolating matrix wh-questions in children's spontaneous speech, we performed a further analysis, looking for sentences in which wh-movement could have co-occurred with topicalization in the left-periphery. If attested, these sentences would indicate that both the Q/Foc position and a Topic position are activated together. Thus providing evidence in favour of an early CP-System already populated by a cluster of different projections.

A pattern very robustly attested cross-linguistically is the possibility of a complex left-periphery consisting of a topic followed by a wh- element. This can involve both a regular wh-element occurring in Spec Foc/Q, and an element like *why*, occurring in the Spec of the higher position Int. This pattern is also possible in adult Italian, as illustrated by sentences (24) and (25). Consider first (24), in which the subject occupies a high topic position. This topic position is above Q/Foc, as the structural representation in (24') shows.

(24) I ragazzi cosa guardano?
   the boys what watch
   "What are the boys watching?"

(24') [$_{TopP}$i   ragazzi [$_{Q/FocP}$ cosa   guardano [$_{IP}$ ...[$_{VP}$]]]]
        the   boys   what watch

Similarly, in (25) the subject is also in a high topic position above *why*. This latter element is hosted in IntP (25'):

(25) I   ragazzi perchè partono?
    the boys   why   leave
    "Why are the boys leaving?"

(25') [$_{TopP}$I   ragazzi [$_{IntP}$ perchè [$_{IP}$ partono [$_{VP}$]]]]
        the boys   why   leave

A similar instance of a complex CP, widely attested in adult Italian, is one in which the wh-element is preceded by a vocative phrase, occupying another dedicated left-peripheral position (see Moro 2003 on vocative phrases):

(26) Gianni, dove sei?
      Gianni, where are
      "Gianni, where are you?'

The complex sentences (24),(25) and (26) are perfectly natural in Italian and, very interestingly, we found that sentences of the same kind are clearly attested in children's productions. We found 20 examples in which the Wh- is preceded by a Topic or a Vocative phrase hosting the subject. Thus, if we exclude sentences in which the wh-element is the subject, for which no higher topic is attested, the incidence of these 20 examples over the remaining 215 wh-interrogatives is a non-negligible 9.3%. We report some examples in (26) below:

(26)   a. Mucca come stai ?   (Diana, 2;1)   Voc > wh
            cow   how   are
            "Cow, how are you?"

        b. Questo dove   si mette ?   (Rosa 2;10)   Top > wh
            this   where cl goes
            "This, where does it go?"

        c. Tu dove   sei   stato queste due settimane ? (Martina 2;3)   Top > wh
           you where are   been these   two weeks
           "You, where have you been in these two weeks?"

        d. Lui Babbo Natale, cosa   fa ?   (Raffaello 2;11)   Top >wh
           he Santa Claus   what does
           "He Santa Claus what does he do?"

        e. Pinocchio dove vai ?   (Rosa 2,11)   Voc > wh
           Pinocchio where go
           "Pinocchio, where do you go?"

This shows that non canonical sentences presenting the pattern S_{Top} Wh_Q V or *Voc Wh V* are attested already in very young Italian children, providing evidence in support of an already layered left-periphery. The very presence of these complex constructions shed new light on the early availability of Topic projection(s) in children's clause structure. Since this type of sentences are still poorly documented in early Italian (for French, see de Cat 2007), it would be of great interest to establish, through future studies employing a more extensive manual search, what is the distribution of overt topics in the early speech of Italian children.

4.1. General discussion

By analyzing the transcriptions of a group of Italian children, we aimed at documenting the development of their early CP-system following two pathways. The first consisted in tracking down the early occurrences of the complementizer particles found in their speech and the emergence of embedded clauses. Our corpus analysis showed that the complementizer *che* is robustly attested early in the third year of life and that also *di* (marking control infinitives) and *se* (marking embedded questions) are available at the same stage, or immediately after. The individual variation on how early embedded structures appear is remarkable, but from our search it emerged that Italian children start using sentential embedding soon after their second birthday, with many of them already employing the whole inventory of complementizer particles.

We also looked at the age of first appearance of the different types of finite embedded clauses introduced by the complementizer *che* in order to assess whether relative clauses are the first type of embedding available to the child, as observed in other languages by Penner (1995) and Armon-Lotem (2005). This advantage was accounted for capitalizing on the absence of C-selection on relative clauses. Children could then be able to generate relatives before complement clauses since the former do not require a lexical access to the grammatical traits of the embedding verb. Going back to the results of our analysis, the conclusion that relative clauses precede other types of clausal complement is only weakly supported in Italian, and this pattern was observed in only half of our children. The opposite direction was instead found in one child, Elisa, while in other three children the two different types of embedding appear at the same time.

Beside the analysis of complementation, we also extended our research in another direction, looking at the properties of early wh-questions. Wh- interrogatives also activate the CP-system and are informative on children's sensitivity to the different syntactic requirements that are active on specific functional projections. Our search showed that, from very early on, children selectively perform I-to-C movement of the finite verb but only if the wh- element is moved in Q/FocP. On the contrary, inversion is not required with *why/perché* questions, much as in adult grammars. Our data are in line with similar results reported in Guasti (2000). Moreover, the early sensitivity to the specific properties distinguishing *perché* from other wh-elements in Italian also concurs with Thornton's (2008) important observation that English-speaking children behave similarly, even though this distinction is not grammaticalized in adult English.

Our analysis did not only show an overall adult-like behavior with the properties of the single overt functional heads in the CP-System, but it also provided evidence for a

layered structure in which different positions can be simultaneously realized in the adult hierarchical order. In view of the many discourse-pragmatic constraints that should be satisfied, the relevant constructions can be hard to find and to elicit in young children. However, wh-questions targeting the focus position in main clauses are common enough to look for the co-occurrence of focus and topic movement. By looking at wh- sentences, we found that children were also able to project a layered CP by realizing both a Topic (or the akin Vocative position) and a Q/Foc or IntP position together. These complex sentences did not only indicate a refined syntactic competence supporting a layered CP-System, but they also witness a clear sensitivity to the interface between syntax and discourse pragmatics, as uses of topics were invariably appropriate to the particular discourse conditions.

Undoubtedly, the results presented here only provide a first sketch of the early CP-System and more needs to be found by combining targeted experimental investigations with additional corpus studies. In this respect, the collection of supplementary resources with a higher density of diary recordings could help to better define the developmental pattern of less-frequent constructions, overcoming some of the limitations of the present study and allowing to test specific research hypotheses also through the use of inferential statistics.

In concluding the paper we wish to tentatively consider how our results could relate with a recent developmental hypothesis that specifically targets the grammatical growth of the CP-System. According to the proposal presented in Friedmann, Belletti & Rizzi (2020) that we will briefly discuss next, the initial clause-structure available to the child could be a reduced version of the adult structure. This idea is conceptually in line with previous suggestions that the acquisition of syntax proceeds incrementally starting from the lowest portion of the tree (eg. the VP node only, Labeaux 1988, Platzack 1990, Radford 1990; a single XP above VP, Clahsen et al. 1993/94). It is also compatible with the proposal that, once available, higher layers can be "truncated" (Rizzi 1993/94) leading to optionality in the realization of the topmost portion of the clause.

4.2. A stepwise maturation of the CP-System
In a very recent proposal, Friedmann, Belletti & Rizzi 2020 put forth the "Growing Trees" proposal by which the left-periphery grows in the child's mind following steps that are consistent with the articulated map postulated in cartographic research. While our research on the early left-periphery in Italian was not conceived on the basis of this kind of developmental hypothesis, we think it is interesting to briefly investigate the compatibility of our findings with it.

Looking at both spontaneous productions and at the results of a repetition experiment with Hebrew-speaking children, Friedmann, Belletti & Rizzi 2020 advanced the proposal that the articulated structure of the CP does not emerge at once, but that it instead develops into three successive stages: the first shows mastery of the basic clausal structure (the IP) with no manifestation of the left-periphery: the second stage shows knowledge of the lower portion of the left-periphery, including, among other positions, the landing site of wh-movement, and the third stage manifests mastery of the higher part of the left-periphery, including the Force node, the target of selection from higher selectors, which makes different kinds of embeddings possible. In this

sense, the syntactic tree "grows" from a total absence, to a partial specification, and then to a complete specification of the CP system.

This model was supported by the fact that, after the first stage in which no peripheral construction was manifested, at the second stage of development, children acquiring Hebrew could ask *wh*-questions by productively fronting interrogative pronouns like *who*, *what*, *where*, etc., but they were not able yet to produce embedded clauses (declaratives or relatives), nor *why*-questions, nor topicalized structures. Capitalizing on the cartographic map of the CP-system, Friedmann, Belletti & Rizzi (2020) observed that the structures appearing in the following (third) stage have the property in common that they need to activate projections in the highest layer of the left-periphery, ForceP (for relatives, Force is required to hosts the relative operator; for embedded declaratives, Force is required in order to satisfy selectional properties from higher selectors), IntP (for *why* questions) and TopP, respectively.

In this model, at the second stage, children would only have a partial representation of the left-periphery, projected up to Q/FocP. It is only in a later third stage that the CP-system grows so to include higher positions, and the full adult structure.

If the same reasoning is applied to Italian, we would also expect a division of the CP-system into zones that would become available sequentially: after a first stage with no manifestation of the CP system, we would expect a second stage with the lowest portion of the CP, up to Q/FocP, and then, successively, a third stage, with the upper part of the CP including IntP and ForceP. The second and third stages, and the functional projections available in them, can be represented as in the table 10 below (remember that stage I corresponds to a developmental stage in which the left-periphery is totally absent and the lower IP layer can be still in the process of growth, as in previous proposals mentioned earlier):

ForceP	IntP	TopP	Q/FocP	ModP	FinP
Che	Perché		cosa		
Stage III			Stage II		

Table 10. Stages II and III in the development of the left-periphery, according to the Growing Trees proposal

According to this model, constituent questions targeting the Q/FocP layer should be available before *why*-questions, which would only be manifested at stage III. In this later stage, *why*-questions and clausal embedding requiring the projection of ForceP would appear together. The particle *che*, an overt manifestation of ForceP, would then appear together with *why*, following wh-questions. Other lower complementizer heads, as *se* and *di*, are also predicted to be available only at Stage III since they also require a link with ForceP in order to satisfy the C-selection properties of the embedding verb. In figure 5, we showed that in many children the three particles indeed appear around the same time.

In order to check if the overall developmental pattern presented in Table 10 is supported by the spontaneous production of our Italian-speaking children, we joined together different data points relative to the three constructions that are relevant for evaluating the growing-trees hypothesis:

(26) a. the first occurrence of embedding introduced by *che*   (associated with ForceP)
     b. the first occurrence of *why*-questions   (associated with IntP)
     c. the first occurrence of *wh*-questions   (associated with Q/FocP)

With respect to the constructions in (26), the prediction is that sentences in (26a-b) should never be attested before (26c), since their development is contingent upon the availability of the lower portion of the three. To evaluate this, we confront the age of first occurrence of each of the constructions in (26). The results are plotted in figure 6. For each child, we indicated the month in which the specific construction was attested for the first time.
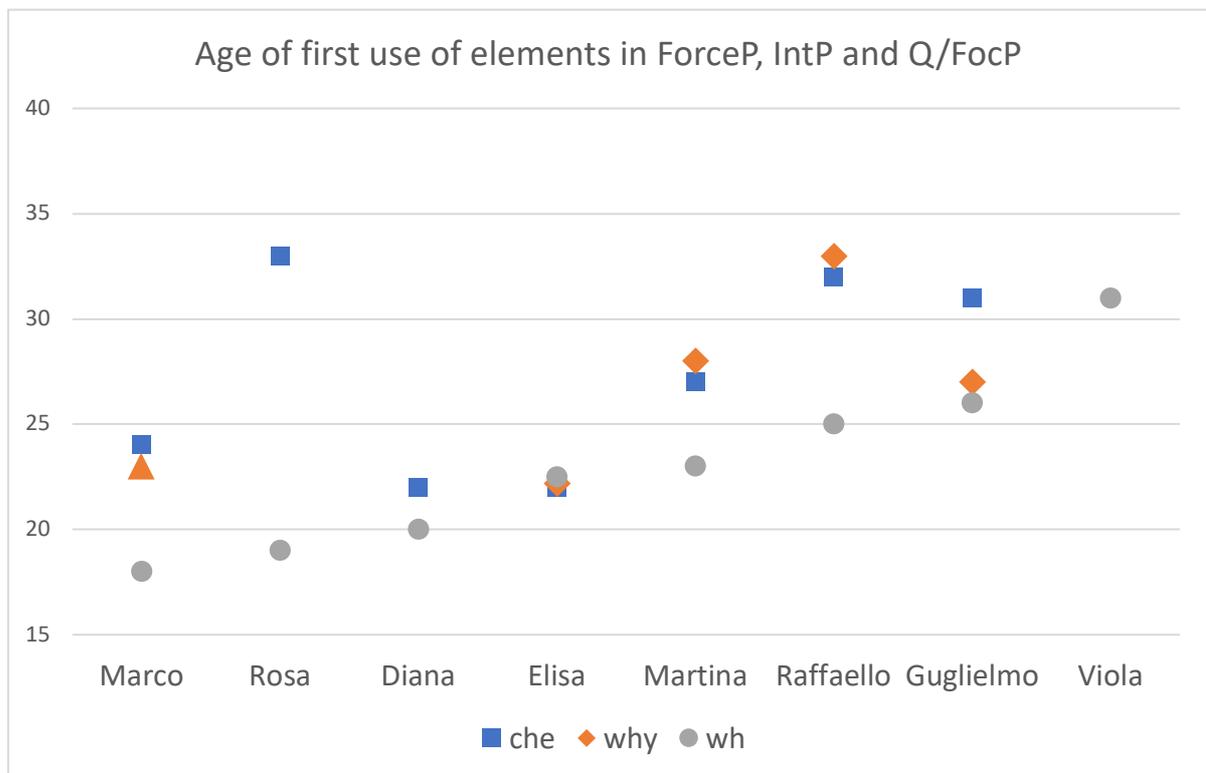
Figure 6. Age of first occurrence of: a) finite embedding introduced by *che*; b) *why* questions; c). wh-questions. Data are reported for each child, with the exclusion of Francesco and Gregorio, whose transcriptions end too early and Camilla (see footnote 3)

Figure 6 shows that wh-questions are the earliest to be attested in relation to the other types of sentences in (26a-c) and this pattern is consistent across all children. Also notice that, if only a subset of the constructions in (26) is produced, this invariably includes wh-questions, expected at the earliest stage in which the CP structure is manifested (stage II). In general, constructions that belong to the successive stage involving the growth of the upper part of the CP (stage III) are absent (as in Rosa, Diana, Viola) or delayed if compared with the emergence of wh-questions (as in Marco, Martina, Raffaello, Guglielmo).

Only in the case of Elisa, they all appear at the same time. This child showed an already fully-fledged CP before the end of the second year – remember that she also produced

all the CP particles – thus no developmental effect is visible in this case: Elisa already made it to Stage III before her second birthday. This should come as no surprise, given the important individual variation in the speed of development: whereas the transition from one stage to the next may occur at very different ages in individual children, what the Growing Trees approach expects is that the sequence of stages will not be violated in the developmental path of a particular child, and this is indeed what we observe in the data.

Conclusion

Cartographic research showed that the CP system should be split into a sequence of functional elements (Rizzi 1997), much as the IP system (Cinque 1999). These findings raise questions for language acquisition: how and when are these complex configurations acquired by the learner? In this paper we started addressing these questions for the development of the CP-system in Italian.

The CP-system clearly is part of the child's grammar from the beginning of the third year of life, or even earlier. Moreover, there are direct manifestations that the child has access to the fine details of the CP structure. On the one hand, the child is sensitive to the position of occurrence of the wh-element in the fine structure of the CP, differentiating the case of the landing site of ordinary wh-movement, Foc/Q (for elements like *who, what, where*, etc.), and the case of *why*, base-generated in the higher position Int. In the adult grammar, ordinary wh-elements require inversion, whereas *why* does not, a property derived from the criterial approach in the analysis we have adopted. Such a different behavior of ordinary wh-elements and *why* is already reflected in the early productions we have examined. On the other hand, the corpus study provided clear evidence that young children are already able to produce complex CP systems with the co-occurrence of distinct elements in the CP space: this was shown by productions involving a topic or a vocative followed by the wh-element.

In the final part of the paper we also discussed the implications of our results for the Growing Trees approach (Friedmann, Belletti & Rizzi 2020). This approach assumes that the CP system develops in three successive steps: the first in which the CP-system is absent; the second, which involves the lower zone of the left-periphery, with the landing site for wh-movement; and the third, involving the upper left-peripheral zone, hence specifying the position of occurrence of *why* (in Int) and the Force position expressed by *che* (and also other positions that we have not discussed here). We observed, in line with the Growing Trees approach, that ordinary wh-movement is systematically attested earlier than *why* questions and embedded declaratives introduced by *che*. We very much hope that our preliminary results will trigger more corpus-based and experimental research to make advances on the acquisition of the complex structural configurations uncovered in cartographic research.

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