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*The acquisition of the syntax of adjectives
by Italian monolingual children
A corpus study*

Relatrice

Prof. Emanuela Sanfelici

Correlatrice

Prof. Cecilia Poletto

Laureanda

Maria Francesca Ferin

n° matr.1179193 / LMLIN

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Introduction

The syntax of adjectives is a fascinating subject in many respects. Adjectives show a wide range of semantic, syntactic and even lexical different behaviours in the languages of the world. In Romance languages, like Italian, complex patterns are found within-language, thus providing an interesting challenge to language acquisition. While in Germanic languages adjectives are mainly or exclusively prenominal, in Romance they are either pre- or postnominal, with the postnominal position being the preferred one. The position in which an adjective may appear depends on semantic and lexical properties of the adjective itself.

The syntactic nature of adjectives has been long debated and has not yet reached a consensus. The main points that have been discussed in the last decades are their phrasal status (are they merged as phrases or as functional heads?) and syntactic function (if phrasal, are they adjuncts or are they merged in the specifier of a functional projection?), the nature of the ordering restrictions that are observed in many languages (whether they are determined by external cognitive factors or instantiated in syntax) and their interaction with the semantics of the nouns they modify.

An attempt to provide a systematic account of the issues involved in adjectival syntax was made by Guglielmo Cinque. Based on a series of distinctions that had been noticed in the previous literature, Cinque proposes that adjectives may modify the DP in two ways, as direct modifiers or as indirect modifiers (Cinque, 2010). The interpretive and syntactic differences between the two will be explored in chapter 1.

The purpose of this study is to investigate how children at the onset of syntactic acquisition deal with this complex interaction of semantic, syntactic and lexical factors. A corpus study on the spontaneous production of four children between a year and a half and three years of age has been conducted, following three research questions:

- How do children acquire the semantics of adjectives?
- How do children acquire the syntax of adjectives?
- How do children acquire the alleged syntax-semantics mapping?

More in detail, I will consider the acquisition of semantic-conceptual classes (such as colour, shape, dimension, etc), with an eye on the way in which meaning is mapped by children onto the property denoted by the adjective. As concerns the syntactic acquisition, the aspects that will be considered

are the syntactic function of early adjectives and their interaction with the syntax of the DP. Finally, the acquisition of the two types of adnominal modification and the interaction with semantic classes will be considered.

The ultimate goal, however, is not a descriptive analysis of children's behaviour, but an attempt to engage a theoretical approach to syntax with language acquisition research and to test the predictions that it makes for it. Cinque's approach to the syntax of adjectives lies within the line of research of cartography; therefore, some predictions will be made based on this approach and will be checked against acquisition data. In this way, acquisition research will benefit from an alternative perspective for analysis, and a theory of syntax will be challenged in a new empirical domain.

This work is organised as follows: in chapter 1 a review of the literature on the syntax of adjectives will be carried out and the properties of adjectives in Italian will be examined in detail. Chapter 2 deals with some acquisition works that address some aspects of the syntactic and semantic acquisition of adjectives. The majority of studies on this issue focused either on the syntactic or on the semantic aspect; very few combine the two, as this study attempts to do instead. As will be seen, the study of the interaction between syntax and semantics of adjectives yields interesting results. In chapter 3 the method is described in detail and a general overview of the results is given. In chapter 4 a detailed individual analysis of each child and a general discussion of the results are carried out. A last chapter is dedicated to summarising the conclusions and to pointing out the issues that remain open for future research. Finally, the tables that were not included in the chapters are reported in the appendix.

Chapter 1. The syntax of adjectives

1.1 Introduction

It is widely accepted that adjectives constitute one of the three universal lexical categories, together with nouns and verbs, as argued by Dixon (2004). Adjectives prototypically designate properties, in the same way that nouns prototypically designate objects and verbs designate events. However, adjectives display a much wider variability than nouns and verbs, both in the various forms that they can take and in the criteria that set them apart as an independent category in each individual language (see also Alexiadou, 2014).

One major difference between languages is the size and nature of the adjective class. Some languages have a small, closed class of adjectives, while others have much larger and open classes. Italian belongs to the latter type: it has an open class of adjectives, counting many members. Adjectives also differ across languages in the morphological form they can take. They may display either noun-like inflection, or verb-like inflection, or both, or neither (Dixon, 2004). Their syntactic function may also vary. Adjectives can occur as predicates of a copula, as intransitive verbs or as noun modifiers.

1.1.1 Properties of Italian adjectives

Italian has a large, open class of adjectives, which show the following properties:

1. Adjectives in Italian can function as both predicates and nominal modifiers. As predicates they can occur as copula complements or as complements of another predicative verb (e.g., *sembrare* ‘to seem’). When adnominal, they can occur both pre- and postnominally, i.e., they can precede or follow the noun. Additionally, they can also appear in a DP with a dropped noun¹.

(1) a. Il gelato è **freddo** (postcopular)
the ice-cream is cold

¹ I will call such adjectives *pronominal* in a broad sense, to signify that the DP involves a pronominalization, but without implying that the adjective itself is the pronominalized element.

- b. Mi sembri **stanco** (with a predicative verb)
 to.me seem tired
 'You look tired'
- (2) a. Ho una palla **verde** (postnominal)
 have a ball green
 'I have a green ball'
- b. Gianni vive in una **bella** casa (prenominal)
 Gianni lives in a nice house
- c. Voglio quella **piccola** (pronominal)
 want that small
 'I want the little one'

2. Adjectives are always inflected for number and gender, whether they are used as predicates or as nominal modifiers. Their inflection depends on number and gender agreement with the noun, not only when used attributively, but also in predicative position. There is only a small class of invariable colour adjectives (*blu* 'blue', *rosa* 'pink'...)² (Noccetti, 2015).

- (3) a. l-a cas-a bell-a
 the-FEM.SG house-FEM.SG beautiful-FEM.SG
- b. l-e cas-e bell-e
 the-FEM.PL house-FEM.PL beautiful-FEM.PL
- (4) l-a cas-a è bell-a
 the-FEM.SG house-FEM.SG is beautiful-FEM.SG (Noccetti, 2015, p. 57)

3. Adjectives in Italian are gradable: they can have positive, comparative and superlative grade. Comparative and relative superlative have an analytical form (5)-(6), whereas absolute superlative can be expressed through the synthetic form *-issim(o)*³ (7).

- (5) una casa **più bella** (della mia)
 a house more beautiful of.the mine
 'a more beautiful house (than mine)'
- (6) la casa **più bella** di tutte
 the house most beautiful of all
 'the most beautiful house of all'

² There are some further types of invariable adjectives such as cardinal numerals, loan words (*snob*, *standard*) and adjectives like *dappoco*, *dabbene*, *pari*, *dispari* (see Guasti, 2001, p. 336).

³ This suffix is productive in forming the absolute superlative. There is also a small class of adjectives that form the superlative with the non-productive suffix *-errimo* or *-entissimo* (*celebre* 'famous': *celeberrimo*, *benevolo* 'benevolent': *benevolentissimo*) (Guasti, 2001, p. 322).

- (7) una casa bell-issima
a house beautiful-SUP-FEM.SG
'a really beautiful house'

4. Adjectives can be coordinated, both in predicative and in attributive position.

- (8) a. ho una palla **verde e blu**
have.1SG a ball green and blue
'I have a green and blue ball'
- b. la mia palla è **blu e verde**
my ball is blue and green

5. Finally, they can be morphologically modified by diminutive and evaluative suffixes, and syntactically by adverbs.

- (9) una bambina piccolina
a girl little.DIM

- (10) questa casa è molto bella
this house is really nice

The syntax of adjectives, and the interface between syntax and semantics as far as adjectives are concerned, have been hotly debated. In this chapter, I will explore some of the issues that have been discussed. In section 1.2 I will review some properties of adjectives that have brought to a distinction between two types of adjectival modification, both on the semantic and the syntactic level. I will follow Guglielmo Cinque's analysis, who proposes that there are two sources for adjectival modification: a *direct modification* source and an *indirect modification* source (Cinque, 2010). Section 1.3 and section 1.4 treat in detail direct and indirect modification adjectives respectively, analysing their properties and relating them specifically to Italian adjectives. In section 1.5 I discuss which type of movements are involved in the derivation of the two sources. Section 1.6, instead, is dedicated to the analysis of the relationship between adjectival modification and the syntax of the DP in general. Finally, section 1.7 provides a summary of the chapter and some predictions that can be made for acquisition.

1.2 Different kinds of adjectival modification

A much-debated issue comes from the observation that not all adjectives relate to the noun they modify in the same way, a fact which has led many authors to distinguish two separate classes of

adjectives, with different semantic and syntactic properties⁴. Let us examine the facts that led to this distinction.

As a starting point, we may consider Sproat & Shih's (1988) observations on Chinese adjectives. Sproat & Shih notice that Chinese adjectives come in two forms: one with a *de* particle, and one without. These two types have different syntactic properties: *de* adjectives are freely ordered, as shown by the grammaticality of (11), while *de*-less adjectives are rigidly ordered, and their ordering is the same as the unmarked English one, as in examples (12) (see below, section 1.3.2).

(11) a. xiao-de lu-de hua-pin
small-DE green-DE vase

b. lu-de xiao-de hua-ping
green-DE small-DE vase
'small green vase'

(12) a. xiao lu hua-ping
small green vase

b. *lu xiao hua-ping
green small vase
'small green vase'

Sproat & Shih (1988, 1991) call *de*-less adjectives 'direct modification' and adjectives with *de* 'indirect modification'. This terminology has been taken up by other authors to characterise the divide between the two kinds of adjectives more deeply, and to correlate it with a series of interpretative reflexes.

These properties have been exhaustively investigated and assembled by Guglielmo Cinque in his monography on the syntax of adjectives (Cinque, 2010). Building on previous theoretical and typological works, his study collects and describes a series of properties which have been noticed to distinguish different classes of adjectives, and demonstrates that they are all connected and can be derived by one single fact, i.e. the syntactic positioning of the adjectives themselves. Thus, in Cinque's system, the divide between 'direct' and 'indirect' modification adjectives is rooted in their syntactic structure.

⁴ Alexiadou (2014), in her introductory chapter on the syntax of adjectives, talks about a 'reductionism' approach, which attributes the same derivation to all kinds of adjectival modification (attributive and predicative) and a 'separationism' approach, which sees them as deriving from two different sources. I will focus on the latter for the following discussion. Alexiadou's discussion, at least in some respects, is too centred on the syntax of English adjectives, as many points do not apply to Italian and many other languages.

1.2.1 Interpretation

The same two types of adjectival modification of Chinese can also be identified in English and Romance languages, despite the lack of an overt morphological distinction between the two types. However, other cues, mainly semantic ones, are proposed in the literature to support this distinction. In this section interpretive properties of adjectives will be analysed; it will be shown that many adjectives are ambiguous between two readings, and that this ambiguity correlates with their syntactic position. For convenience, I will not repeat here all the patterns that are discussed by Cinque (2010, 2014), but will focus on some.

Restrictive – non-restrictive

A first distinction is between adjectives with a restrictive and a non-restrictive reading. In the former case, the adjective restricts the set of possible referents opened by the noun by isolating those that have the property referred to by the adjective. Non-restrictive adjectives, instead, do not restrict the possible referents, but attribute a property to the elements of the set itself, which in turn are already established as referents. The difference is exemplified in (13). In a context in which many balls are present, the two adjectives in (13)a restrict the set of balls to those having the property of being blue and those having the property of being red. The evaluative adjective in (13)b, instead, does not restrict the set of parents, but attributes a property of being loving to all the members of the set, namely, my two parents.

- (13) a. I want (only) the **red** balls and the **blue** ones. (restrictive)
b. My **loving** parents will always support me (non-restrictive)

Observe that adjectives can be ambiguous between these two interpretations in prenominal position in English: depending on the context (especially when no contrast is introduced), *the red ball* might be singling out one ball in a set, or just describing the property of my favourite ball, without setting it aside from other ones.

Different from the English examples in (13), in which the adjective in prenominal position allows for two possible readings, in Italian the two readings are connected to the syntactic position of the adjective: the prenominal position can only host a non-restrictive adjective. For instance, example (14)a is unambiguously non-restrictive, meaning that all of Ferri's lessons were boring. On the contrary, the postnominal position gives rise to both readings, thereby displaying the same ambiguity that we find prenominally in English. The postnominal *noiose* 'boring' in example (14)b allows both a non-restrictive reading (all of Ferri's lessons were boring) and a restrictive one (only

those lessons that were boring are remembered). Therefore, restrictive modification is only possible with postnominal adjectives, while a non-restrictive interpretation is possible in both positions.

- (14) a. Le **noiose** lezioni di Ferri se le ricordano tutti
the boring classes of Ferri remember all
'Everybody remembers Ferri's classes, all of which were boring' (nonrestrictive)
- b. Le lezioni **noiose** di Ferri se le ricordano tutti
the classes boring of Ferri remember all
'Everybody remembers Ferri's classes, all of which were boring' (nonrestrictive)
or
'Everybody remembers just those classes by Ferri that were boring' (restrictive)

(Cinque, 2010, p. 8)

Stage-level – Individual-level

Adjectives with an individual-level reading attribute to the noun they modify a property which is inherent to its denotation or is a stable property of the denotation of the noun they modify. Adjectives with a stage-level reading, instead, only attribute a temporary property, tied to the present state of the referent (cfr. Alexiadou, 2014). In (15)a, the ball is inherently red, and it is not likely that it will change its colour; in (15)b, the ice-cream was probably frozen a few minutes ago and is only melted now.

- (15) a. That red ball is my son's favourite toy.
b. I won't eat that melted ice-cream!

In English, prenominal adjectives may be interpreted in either way (16). In Italian, when the adjective can be both pre- and postnominal, the possible interpretations are not symmetric: postnominally we can have both readings (17)a, whereas in prenominal position the adjective can only receive an individual-level interpretation (17)b.

- (16) The visible stars include Aldebaran and Sirius
'the stars that are generally visible include Aldebaran and Sirius' (individual-level)
or
'the stars of Andromeda that happen to be visible now include Aldebaran and Sirius' (stage-level)

- (17) a. Le stelle **invisibili** di Andromeda sono moltissime
the stars invisible of Andromeda are very many
'Andromeda's stars, which are generally invisible, are very many' (individual-level)
or
'Andromeda's generally visible stars, which happen to be invisible now, are very many' (stage-level)

- b. Le **invisibili stelle** di Andromeda esercitano un grande fascino
 the invisible stars of Andromeda have a great fascination
 ‘Andromeda’s stars, which are generally invisible, are very many’ (individual-level)

(Cinque, 2010, p. 7)

Other interpretative differences and summary of all properties

Other similar observations have been made. For example, scalar adjectives⁵, such as *tall*, can either receive an absolute interpretation (something generically tall), or be interpreted relatively to a comparison class. The English example in (18) is ambiguous between the two readings (one in which New York’s buildings are just tall objects, and one in which they are tall compared to the average height of buildings)⁶. The Italian example, instead, shows that this ambiguity again correlates with position. Example (19)b, where the adjective is postnominal, is ambiguous, whereas (19)a, where the adjective is prenominal, can only receive an absolute reading.

(18) New York’s very tall buildings impress everybody (ambiguous)

(19) a. Gli **altissimi** edifici di New York colpiscono tutti
 the very-tall buildings of New York strike all
 ‘New York’s buildings, which are very tall objects, impress everybody’ (absolute)

b. Gli edifici **altissimi** di New York colpiscono tutti
 the buildings very-tall of New York strike all
 ‘New York’s buildings, which are very tall objects, impress everybody’ (absolute)

or

‘New York’s buildings, which are very tall compared to the average height of buildings, impress everybody’ (relative)

(Cinque, 2010, p. 11)

Similarly, a prenominal adjective in Italian forces an indefinite DP to be specific (20)a, while a postnominal one is compatible either with a specific or non-specific interpretation of the DP (20)b.

(20) a. Domani, alla festa interverrà un **famoso** attore
 tomorrow, to-the party will-intervene a famous actor
 ‘Tomorrow, a certain famous actor will come to the party’ (specific)

⁵ Scalar, or gradable, adjectives, “are compared against a comparison class. The property which they assign to the noun is not assigned in any absolute terms, it is interpreted with respect to a certain standard” (Alexiadou, Haegeman, & Stavrou, 2007, p. 316).

⁶ In Alexiadou et al.’s (2007) examples, a *big elephant* is not generally big, but is called big ‘for and elephant’, i.e., in comparison to the class of other elephants; similarly, a *big butterfly* is big ‘for a butterfly’, and is not a generally big animal. Cinque contends, however, that a *big elephant* might also be a generically big animal; in English, both interpretations are possible.

- b. Domani, alla festa interverrà un attore **famoso**
 tomorrow, to-the party will-intervene an actor famous
 ‘Tomorrow, a certain famous actor will come to the party’ (specific)
 or
 ‘Tomorrow, I know that some famous actor or other will come to the party’ (non-specific)

For a complete review of all such distinctions, I refer to Cinque (2010, Chapter 2). What matters here is the observation that these semantic properties are not independent from each other, but follow a clear pattern, which is shown in Table 1 for Italian:

Prenominal interpretation	NOUN	Postnominal interpretation
Individual-level	Noun	Individual-level or stage-level
Non-restrictive	Noun	Non-restrictive or restrictive
Absolute	Noun	Absolute or relative to a comparison class
Specificity-inducing	Noun	Specificity inducing or non-specificity-inducing

Table 1 Adjective interpretation in pre- and postnominal position in Italian

A generalisation emerges from the data reviewed above. There are two sets of adjectives, which allow opposite interpretations (cfr. Cinque, 2014, p. 21). A first group modifies the *reference* of the nominal expression, or its *intension*, i.e., the set of properties that characterize and define the class to which the noun pertains. In this case, an adjective modifies the properties that identify the possible referents. This set corresponds to S(proat)&S(hih)’s *direct modification* adjectives (henceforth DM). The second set modifies the *referent* of the determiner phrase, or its *extension*, i.e., it modifies the class of elements denoted by the nominal expression; this set corresponds to S&S’s *indirect modification* (henceforth IM) (Cinque, 2010)⁷.

1.2.2 Syntactic properties

The fact that these clusters of possible readings have two different sources is supported by the fact that they can co-occur in the same nominal phrase. Importantly, when this happens, the two adjectives are mutually ordered, both in English and in Italian. Those with a direct modification interpretation are closer to the noun than the others, both pre- and postnominally. Examples (21)-(22) show this in detail. (22)a, for instance, shows two occurrences of the same adjective. The only

⁷ Other authors recognise the same split; DM adjectives are often called *attributive* and IM are called *predicative* (Alexiadou, 2014; Alexiadou et al., 2007); Demonte (2008) talks about restrictive vs non-restrictive, etc.

possible interpretation is that rivers that are usually navigable (*individual-level*) are not navigable in this moment (*stage-level*); the reverse does not hold.

- | | | |
|---------|---|------------------------------------|
| (21) a. | Every VISIBLE visible star | stage-level > individual-level > N |
| b. | A RED big ball | restrictive > non-restrictive > N |
| c. | I have never seen QUITE SO TALL tall buildings | relative > absolute > N |
| (22) a. | I fiumi navigabili NON NAVIGABILI | N < individual-level < stage-level |
| b. | Le lezioni noiose PIÙ NOIOSE | N < non-restrictive < restrictive |
| c. | edifici altissimi COSI' ALTI | N < absolute < relative |

A further syntactic property is related to the possibility of occurring in predicative position. Not all adjectives can be predicates of a copula (or another predicative verb), as shown in (23)-(24). Importantly, those adjectives that cannot appear in this position are also unambiguously direct modification ones. Furthermore, when an adjective is ambiguous, its ambiguity disappears in predicative position. Here only indirect modification remains available, as shown in example (25). This suggests that indirect modification is bound to the possibility for the adjective to be predicative.

- | | | |
|---------|--|--|
| (23) a. | un sedicente erede
an alledged heir | |
| b. | *questo erede è sedicente
this heir is alledged | |
| (24) a. | il mio futuro marito
the my future husband | |
| b. | *mio marito è futuro
my husband is future | |
| (25) a. | gli amici falsi
the friends false | (restrictive: his friends are hypocritical – IM) |
| b. | i falsi amici
the false friends | (privative: the individuals denoted by the noun are not friends – DM) |
| c. | i suoi amici sono falsi
the his friends are false
'his friends are false' | (restrictive: his friends are hypocritical – DM) |

(adapted from Cinque, 2010, p. 18)

We are able now to discern some definite patterns that correlate adjectival semantics and syntax. In section 1.2.1, we have identified two sets of adjectives, identifying them with S&S's direct and indirect modification ones. DM adjectives, which receive an individual-level, non-restrictive, etc. reading, can appear either prenominal or postnominal; when postnominal, they are closer to the

noun than the other class; these adjectives cannot occur in predicative position with the relevant reading. IM adjectives, with a stage-level (or individual-level), restrictive, etc. reading can only appear in postnominal position or as a predicate; in multi-adjective strings, they must follow any postnominal DM adjective.

It is important to notice that many adjectives can belong to both groups, i.e., can appear in both positions and receive the corresponding interpretation; this is the actual source of ambiguity.

Interestingly, other languages display the same ambiguities in terms of adjectival interpretation but associate them with different syntactic properties. Many languages can only have prenominal adjectives; when this is the case, indirect modification always linearly precedes direct modification, so that, although the order is the mirror of the Italian one, the relative distance from the noun is the same. English follows this pattern, except that it allows a limited number of adjectives in postnominal position; these always receive an indirect modification reading.

- (26) The (only) stars **visible** (=that are visible now) are Aldebaran and Sirius (stage-level)
(27) Every word **unsuitable** (=that was unsuitable) was deleted (restrictive)

The question arises of how we can relate all these properties. Is it possible to provide a unified account for these (and many more similar) phenomena, in spite of the differences? In the next section, we will see how Cinque deals with this variation, and how he proposes a comprehensive account of adjectival modification.

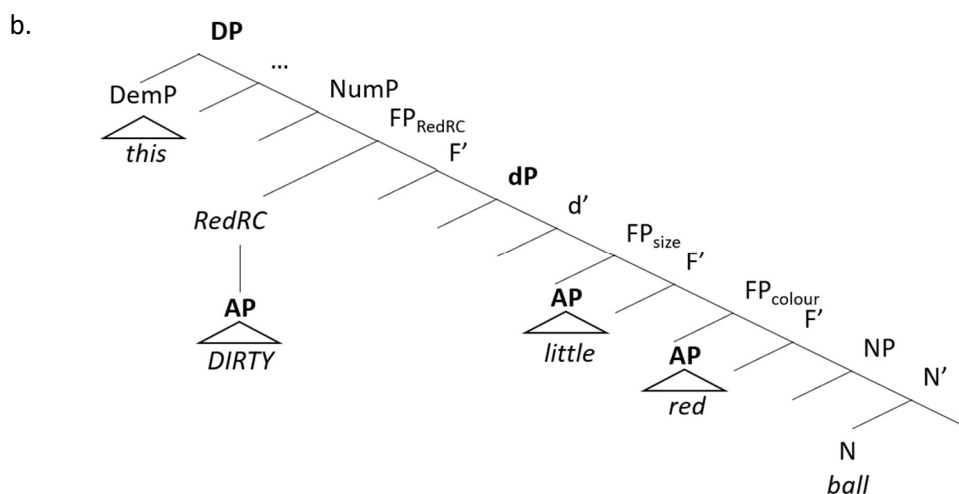
1.2.3 Syntactic interpretation (Cinque 2010)

Cinque's goal is to provide a unified account for the variation displayed by the languages of the world with regards to the patterns seen above. His proposal is that the observed differences (concerning interpretation and syntactic behaviour) do not depend on the adjective itself, but on the syntactic position in which it enters the structure.

Adjectives can have two different syntactic sources when modifying a DP. Those adjectives that show the *intensional* kind of modification are merged directly as specifiers of functional projections that belong to the Extended Projection of the noun, and for this reason function as direct modification (DM) adjectives. In contrast, predicative adjectives, or indirect modification (IM) ones, are in fact derived from a relative clause source, and can be considered as reduced relative clauses (RedRC). Reduced relatives are merged in the specifier of a functional projection, which is higher in

the structure than those projections that host a direct modification adjective. Thus, the universal order of merge would be the one in (28).

(28) a. The *DIRTY* little red ball (= the little red ball *which is dirty*)



Direct modification APs⁸ are merged below “a ‘small’ indefinite dP” (Cinque, 2010, p. 34), which is also the external Head of relative clauses (cfr. Cinque, 2008). Reduced RCs are merged above this dP, which is matched with an internal Head merged inside the RC itself (see the detailed derivation in section 1.4.2). This derivation accounts for the *intensional* vs the *extensional* modification of the two sources of adjectives: RedRCs are merged above the dP, which is indefinite and partially referential; thus, the interpretation of the maximal DP is given by the “intersection of the set contributed by dP and the set contributed by the relative clause” (Cinque, 2010, p.34). Direct modification adjectives, instead, are merged below dP, and in virtue of this “modify something that is still predicative in nature” (Cinque *ibid.*).

In this structure, all adjectives are merged preminally, either directly or as predicates of a reduced relative clause. Thus, the order of languages like English in fact overtly displays the order of Merge. In this account, postnominal positions are always derived via movement. As will be seen in section 1.5, Italian displays a complex interaction of obligatory and optional movements which accounts for its variation.

⁸ For convenience, the phrases projected by adjectives are labelled A(djective) P(hrase). It has been shown, however, that more structure is built above the lexical phrase AP (cfr. Corver, 1997). I will not address this issue here, nor the question whether direct and indirect modification adjectives project the same amount of structure.

First, however, the two types of adjectival modification will be examined in detail. Section 1.3 discusses the properties of direct modification adjectives and the issues connected with their ordering, and section 1.4 discusses indirect modification adjectives.

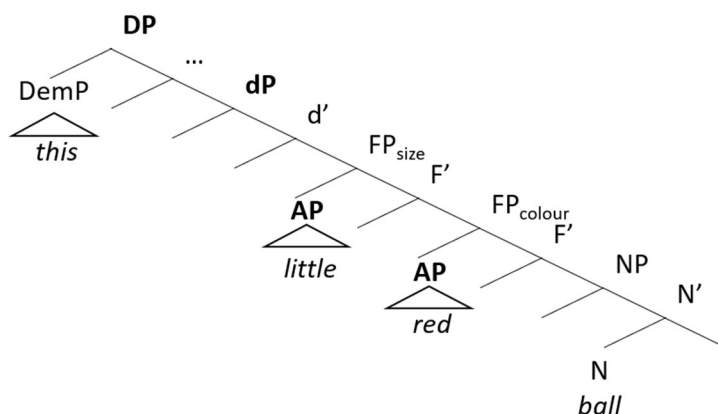
1.3 Direct modification adjectives

1.3.1 Summary of semantic properties

As we have seen, DM adjectives are directly merged as maximal phrases in the specifier of some functional projections. Their interpretive properties derive from this position: by being merged below the dP, they modify the *intension* of the noun phrase, and are thus interpreted in an absolute, non-restrictive way, as shown in (29). In this example, the ball that is played with is taken to be inherently *little* and *red* and this property is given by the syntactic configuration that the adjectives take with respect to the noun.

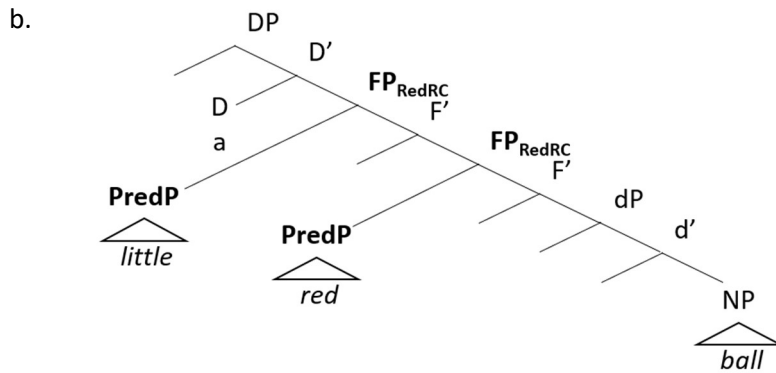
(29) a. When I was a child, I always played with this little red ball

b.



Note that this reading is the most natural in the context, but the same two adjectives could be used predicatively as well. In a sentence like the one in (30)a I might mean that I need a ball that is (specifically) little and red, thus requesting a predicative interpretation for the adjectives. Crucially, difference in interpretation in these two cases is related to the position in which the adjectives are merged. In the second example, with the given interpretation, the two adjectives are merged as predicates of a relative clause, as shown in (30)b.

(30) a. I need a little red ball



1.3.2 Adjective ordering restrictions (AOR)

We now turn to an important property of direct modification adjectives, namely adjective ordering restrictions (AOR). Some languages impose a rigid, inviolable order on adjectives that precede (or follow) the noun and any other ordering produces agrammaticality. This is also true for languages that overtly distinguish between two adjective classes; in these languages, only one of the two classes is rigidly ordered. (31)-(32) shows the case of Chinese *de*-less adjectives.

(31) a. **da yuan** zhuo
large round table SIZE > SHAPE

b. ***yuan da** zhuo
round large table

(32) a. **hao yuan** pan-zi
good round plate VALUE > SHAPE
'nice round plate'

b. ***yuan hao** pan-zi
round nice plate

(Sproat & Shih, 1988, pp. 466–468)

Other languages such as English appear to be less rigid in that they have a preferred, unmarked order but they also apparently allow reversals. Importantly, the rigid order of the first corresponds to the unmarked order of the latter. This is taken not to be a mere coincidence, but to amount to the fact that those languages where the order is rigid a) have a closed class of adjectives, that cannot appear in predicative position and can therefore only be used attributively in direct modification, or, b) overtly marks the two classes and therefore imposes a rigid order on the direct modification one. Conversely, an unmarked order that actually allows alternatives is present in those languages that have an open class of adjectives and that allow adjectives in both functions, predicative and attributive, without overtly distinguishing them.

Cinque's claim is that the ordering is universal, and that the variation seemingly allowed in some languages derives from the interaction between direct and indirect modification adjectives.

Whenever two adjectives seem to violate the universal AOR, the outmost adjective is an indirect modification one⁹.

- (33) a. a **big red** ball
b. a **RED big** ball (= a big ball *that is* red)

A discussion of the problems involved in the definition of AOR is carried out by Panayidou (2013, par. 2.4.3-4), who compares the strengths and weaknesses of various approaches. I will follow her line of argumentation here. Cinque's proposal, as we have seen above, takes direct modification adjectives to be maximal projections merged in the Spec of dedicated functional projections in the DP. However, the question arises of what these projections are, what classes can be identified and proved to enter the functional hierarchy and how detailed this classification should be. This subject will be discussed in section 1.3.3 below. First, however, I address the issue of how adjectives are ordered.

A first comprehensive ordering was attempted by Dixon (1982). In his investigation of the crosslinguistic semantic core of adjectival modification, he identified seven adjective types:

- (34) a. Core semantic types, typically present in small adjective classes:
DIMENSION: big, small, long, tall, short, etc.
AGE: new, young, old, etc.
VALUE: good, bad, lovely, odd, necessary, lucky, etc.
COLOUR: black, white, red, etc.
- b. Other types, associated with medium and large classes:
PHYSICAL PROPERTY: hard, soft, heavy, wet, strong, clean, hot, sour; plus a "sub-class referring to corporeal properties" (Dixon, 2004, p. 4) e.g. well, sick, tired, dead, absent
HUMAN PROPENSITY: jealous, happy, kind, clever, proud, ashamed, eager, etc.
SPEED: fast, quick, slow, etc.
- c. Order: Value > Dimension > Physical property > Speed > Human propensity > Age > Colour > N

This classification is not refined enough. For instance, shape adjectives are likely to be included in the physical property type, but Shape is ordered between Age and Colour (35).

- (35) a. An **old square** table Age > Shape
b. A **round red** ball Shape > Colour

⁹ Further sources of reversal that are discussed in the literature are the focusing of one of the adjectives and asyndetic coordination, as in (i), which is characterised by a special intonation (cfr. Sproat & Shih, 1988, 1991, among others).

(i) she loves all those Oriental, orange, wonderful ivories. (Sproat & Shih, 1991, p. 578)

Subsequent works in formal syntax did not aim at providing an exhaustive list of adjective orderings, but just used a few well-established classes in order to prove the existence of ordering restrictions themselves. Thus, Cinque (1994, 2010) only employs the following¹⁰:

(36) Possessive > Cardinal > Ordinal > Quality > Size > Shape > Colour > Nationality

This is clearly incomplete: it cannot accommodate common adjectives like *soft*, *warm*, *jealous* or *sweet*. In addition, adjectives like *former*, *alleged* and others with a modal value are often used in the discussion on the two sources of adjectival modification, but never assigned to a class or a specific position in the DP.

The most coherent attempt to define a hierarchy was made by Scott (2002), who endeavours to draw a detailed universal hierarchy in the spirit of Cinque's cartographic work. He does not, however, consider all kinds of adjectives, but focuses on answering the following questions: 1. Can the category SizeP be further decomposed?; 2. Is there a SpeedP?; 3. Is there a TemperatureP? (Scott, 2002, p. 99). His answer is that indeed SizeP should be decomposed into LengthP, HeightP, WidthP, WeightP. SpeedP comes between Height and Width, and TemperatureP would come after Weight. He concludes that the sequence (although incomplete) should be the following:

(37) Determiner > Ordinal Number > Cardinal Number > Subjective Comment > ?Evidential > Size > Length > Height > Speed > ?Depth > Width > Weight > Temperature > ?Wetness > Age > Shape > Color > Nationality/Origin > Material > Compound Element > NP

A further step is taken by Laenzlinger (2005a), who breaks up Scott's ordering into five meta-categories (38).

(38) [QUANTIF Ordinal > Cardinal] >
 [SPEAK-ORIENT Subjective Comment > Evidential] >
 [SCALAR PHYSICAL PROPERTY Size > Length > Height > Speed > Depth > Width] >
 [MEASURE Weight > Temperature > ?Wetness > Age] >
 [NON-SCALAR PHYSICAL PROPERTY Shape > Color > Nationality/Origin > Material]

¹⁰ This hierarchy is typical of adjectives that modify an object-denoting noun. For eventive nominals, another ordering is provided:

(i) Possessive > Cardinal > Ordinal > Speaker-oriented > Subject-oriented > Manner > Thematic

I will not address here the issue whether event- and object-denoting nouns project two different extended projections or whether it is possible to unify them. As we will see, children do not produce eventive nouns at all, therefore the discussion is not relevant for this study.

1.3.3 Structural position of direct modification adjectives

The syntactic nature of direct modification adjectives has been long debated. Many authors (cfr. Svenonius, 1994; Cinque, 1994, 2010 a.o.) argue against the hypothesis that adjectives are heads of the functional projection they are merged into, as suggested by Abney (1987). The possibility for DM adjectives to be modified in some languages argues against a head approach; furthermore, as Svenonius points out, in a phrase like *some barely hot black coffee*, the adverbial modifier *barely* only applies to *hot*, and not also to *black*. If adjectives were heads in the nominal phrase and the adverb were in the specifier of the highest projection, it would also take scope on the second adjective (Svenonius, 1994, p. 446).

Scholars also argue against an adjunction-based approach, which was initially proposed (among others, see Sproat & Shih, 1988, 1991; Svenonius, 1994). The objections were addressed both to the empirical and the theoretical level: for one thing, adjunction cannot account for AOR, because adjuncts are commonly taken to be freely ordered. For another, an antisymmetric theory of grammar (cfr. Kayne, 1994) disallows adjunction *tout court*. The only possibility left open is that adjectival phrases are merged in the specifier of some projections in the extended projection of the DP. Hence, throughout this work, I will adopt a phrasal approach to adjectives.

I return then to the questions raised in the previous section: how are these adjectives organised in the functional structure of the DP? Cinque's proposal is that each class is merged in a dedicated functional projection; this would be in line with a cartographic approach to syntax, according to which there is a one-to-one correspondence between syntax and semantics, such that the head of each projection encodes a single semantic feature (Cinque & Rizzi, 2010). The question, however, remains of what the relevant categories are and how detailed the hierarchy should be.

As we have seen, (Scott, 2002) argues for a fine-grained decomposition of adjective classes, and suggests that each subclass should be hosted in a separate projection. However, as his classification is only partial, if we wanted to go further and classify all adjectives we would end up with a very long list of individual projections, each motivated only by the need to accommodate a small conceptual type (such as *WetnessP*, *DepthP*...), whose syntactic relevance is purely stipulative.

Panayidou (2013) proposes that, in alternative, there only be projections related to some core semantic classes, and that orderings within classes is determined by other factors, such as frequency and length; these orderings would not be as strict as AOR. She reports that some English speakers seem not to perceive a contrast between phrases such as *a long tall table* (length>height) and *a tall*

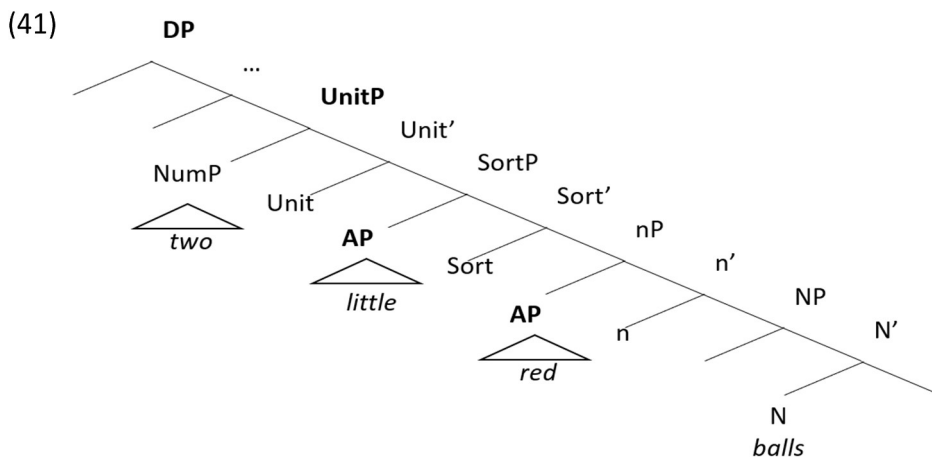
long table (height>length) (Panayidou, 2013, p. 64). Additional evidence in support of Panayidou’s approach comes from Greek adjectival compounds, which can only be formed with adjectives of the same class: the grammaticality of (39)a suggests that width and length might belong to SizeP, whereas the ungrammaticality of (39)b confirms that a width and a colour adjective do not belong to the same class.

- (39) a. steno-makro
 narrow-long (width+length)
 b. *steno-mavro
 narrow-black (*width+colour)

It is not clear, however, how Panayidou would accommodate this conclusion in syntax: whether there would still be multiple FPs as in Cinque, or whether there would be a single FP encoding the general basic class and the single adjectives would be merged as multiple adjuncts within this FP. A similar proposal has been advanced by Svenonius (2008). Finding Scott’s decomposition to lack independent motivation, Svenonius tries to move in the opposite direction: first, to determine which projections have been independently motivated in the DP, and then to accommodate adjectives in their specifiers. For this purpose, he analyses which heads appear in the DP’s functional layers cross-linguistically, namely definite articles, plural markers, and classifiers. He defines three types of classifiers, each merged in a different head. The UNIT head creates countable sets out of masses and hosts numeral classifiers; the SORT head hosts “sortal” classifiers, which sort nominal referents by characteristics such as shape; finally, *n* classifiers “sort the noun by material qualities or essences” (e.g. material adjectives, *wooden*) (Svenonius, 2008, p. 21).

- (40) DP > ... > UNIT > SORT > n > N

Adjectives enter this configuration based on their semantics: idiomatically combined adjectives, such as *wild rice*, are merged below nP; adjectives such as shape, colour and age are merged in Spec,nP, and adjectives like size are merged in Spec,SortP, thus below UNIT. This is in line with Cinque’s idea that all descriptive adjectives follow numerals (UNIT is named NumberP or CardinalityP by other authors (cfr. Svenonius, 2008, p. 27).



This analysis is attractive for two reasons. For one thing, it is more economical than Scott's, because it does not postulate any more heads than the ones that are already proven to exist. However, this is not unproblematic. As Panayidou points out, how can we justify the ordering Shape > Colour, if both are merged in Spec,nP? Svenonius suggests that, when a specifier is already occupied, a second adjective might be merged lower or higher up, in one of the other specifiers, if this makes sense with its interpretation. Still, in the case of Shape > Colour it is unlikely that the shape adjective should be merged in Spec,SortP, where size adjectives are merged.

A second advantage of this proposal is that it introduces a discontinuity in the hierarchy: adjectives have a conceptual core, but they are also associated with the type of modification of a specific head. To maintain Svenonius' basic intuition, I suggest that these functional heads are indeed associated with adjectival modification, but that more functional projections might be present in-between, at least in those languages in which more than one adjective from the same 'zone' can co-occur.

(42) **UNIT** > ... dimension > **SORT** > age > shape > colour > **n** > idiomatic > **N**

This proposal is inspired by Benincà & Poletto's (2004) work on Rizzi's (1997) split-CP. Based on evidence for more than one Topic and Focus position available in Italian and some northern Italian dialects, Benincà & Poletto decompose the left-peripheral Topic and Focus positions into 'fields', i.e. "sets of contiguous and semantically related projections" (Benincà & Poletto, 2004, p. 53). Although the single projections are semantically related, each needs to be justified by a semantic property, in the spirit of defining a one-to-one syntax:semantics cartographic mapping. The same operation might be made in the case discussed here, thus individuating some 'DP-modification fields'. The reconstruction of a "fine structure" is well beyond the possibilities of this study, but should be pursued in future research to complete the picture of cross-linguistic direct modification.

1.3.4 Direct modification adjectives in Italian

Descriptive adjectives

We have seen that in Italian adjectives with a *direct modification* interpretation (non-restrictive, individual-level, absolute reading) can occur either pre- or postnominally. It is not the case, however, that all such adjectives are optionally found in either position. Rather, there are some that only appear postnominally, some that only appear prenominal and some that can be found in either position. An exclusive postnominal position is typical of nationality/origin (43) and classificatory (44) adjectives. Modal adjectives like *sedicente* 'alleged', instead, can only be prenominal (45)(see below).

- | | |
|--|--|
| (43) a. uno studente francese
a student French | (45) a. un sedicente erede
an alleged heir |
| b. *un francese studente
a French student | b. *un erede sedicente
an heir alleged |
| (44) a. l'energia nucleare
the energy nuclear | |
| b. *la nucleare energia
the nuclear energy
'nuclear energy' | |

It is more delicate to distinguish which adjectives show optionality. Cinque (2010) takes this to be the case for colour, shape, size, and value adjectives (46)-(49). Cardinaletti & Giusti (2010), however, correctly notice that colour and shape adjectives mainly appear postnominally in the colloquial register of Italian; when prenominal, they have a formal or literary flavour (cfr. also Cinque, 2010, n. 3 p. 136). This is relevant for the present study, because it is the colloquial register that constitutes the first input for the child.

- | | |
|--|----------|
| (46) a. le verdi colline della Toscana
the green hills of Tuscany | (formal) |
| b. le colline verdi della Toscana
the hills green of Tuscany | |
| (47) a. il tondo ovale del suo viso
the round oval of her face | (formal) |
| b. l'ovale tondo del suo viso
the oval round of her face | |
| (48) a. l' enorme sagoma della cupola
the enormous outline of the cupola | |

- b. la sagoma **enorme** della cupola
the outline enormous of the cupola
- (49) a. il **prezioso** contributo di Gianni
the precious contribution of Gianni
- b. il contributo **prezioso** di Gianni (Cinque, 2010, p. 72)
the contribution precious of Gianni
'Gianni's precious contribution'

Cardinaletti & Giusti further claim that size adjectives are exclusively postnominal too, and that, when prenominal in the colloquial speech, they are used with an evaluative flavour (and are thus merged in a "value" projection). This, however, is less evident. The adjective in (50)a is easily interpreted as evaluative, but the one in (50)b is compatible with a pure size interpretation. I will be more conservative, and take size adjectives to be optional between the two possibilities¹¹. This holds for the 'core' size adjectives in Scott's sense, namely *grande*, *grosso* 'big' and *piccolo* 'little'. Other subclasses of dimensional adjectives organised along a single dimension (length, width, height, etc.) are found postnominally in colloquial speech; when they precede the noun, they receive an evaluative reading or are perceived as slightly formal, as in (51).

- (50) a. questo è un **grande** problema (evaluative)
this is a big problem
- b. ho affittato una **piccola** stanza in centro
have rented a little room in center
'I have rented a small room in the city centre'
- (51) un **lungo** coltello (slightly formal)
a long knife

The same stands for the other categories of adjectives which are not usually considered. *Physical property* (52)-(55) and *human propensity* adjectives (56)-(57) are exclusively postnominal in colloquial speech; in case they can occur prenominal, they have either a formal flavour, or an evaluative reading, as in (53)c, (54)a, (55)c, (56)a.

- (52) a. le calze **bagnate**
the socks wet
- b. *le **bagnate** calze
the wet socks
'the wet socks'

¹¹ However, because judgements in this case are not homogeneous, this claim should be confirmed by further research. Among others, regional/local variation and dialectal influence might be sources for contrasting judgements on this issue. Besides, the picture is complicated by the fact that Italian *grande* and *piccolo* do not exactly correspond to the semantics of English *big* and *small*, because they are 'multidimensional' and are in fact hypernyms for length, width etc. (see Barlassina, 2019)

- (53) a. *una **sporca** superficie (a dirty surface)
 b. una superficie **sporca** (a surface dirty)
 c. uno **sporco** inganno (a dirty scam 'a dirty scam')
- (54) a. un **morbido** cuscino (formal/ a soft pillow evaluative?)
 b. un cuscino **morbido** (a pillow soft)
- (55) a. *una **dolce** torta (a sweet cake)
 b. una torta **dolce** (a cake sweet)
 c. un **dolce** bacio (evaluative) (a sweet kiss)
- (56) a. ?il suo **geloso** fidanzato (formal) (the her jealous boyfriend 'her jealous boyfriend')
 b. ha un fidanzato **geloso** (has a boyfriend jealous)
 c. *ha un **geloso** fidanzato (has a jealous boyfriend 'she has a jealous boyfriend')
- (57) a. la bambina **malata** (the child sick)
 b. *la **malata** bambina (the sick child 'the sick child')

Value adjectives

Evaluative adjectives are found both pre- and postnominally. In many cases, they can receive a non-predicative interpretation in both positions; see examples (58)-(59). Additionally, when postnominal, they can have an indirect modification reading, as discussed above.

- (58) a. un **cattivo** sapore (a bad taste)
 b. un sapore **cattivo** (a taste bad)
- (59) a. un **bravo** insegnante (a good teacher)
 b. un insegnante **bravo** (a teacher good)

The most typical value adjective, *bello*, has a reduced form in prenominal position, showing its own declension pattern, different from the form that appears in postnominal and predicative position, as investigated by Cardinaletti & Giusti (2015). This declension is identical to the inflection of the definite article, as shown in examples (60)-(61), adapted from Cardinaletti & Giusti.

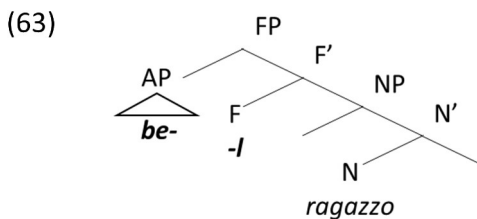
- (60) a. il bel ragazzo (the handsome boy) il ragazzo bello (the boy handsome)
 b. i bei ragazzi (the handsome boys) i ragazzi belli (the boys handsome)
- (61) a. il bell'occhio (the beautiful eye) l'occhio bello (the eye beautiful)

- b. i **begli** occhi **gli** occhi belli
 the beautiful eyes the eyes beautiful

(62) a. è bello/*bel
 (it) is beautiful

- b. sono belli/*begli
 (they) are beautiful

Cardinaletti & Giusti give the following interpretation to this pattern: the prenominal form of the adjective is *be-*, which is an altogether different lexical entry from the postnominal/predicative one. Its special declension is determined by Compensatory Concord. Concord, for the authors, is a feature-sharing relation between a Specifier and a Head. Compensatory Concord, in particular, is a case of Concord in which the feature is null on the specifier and is overtly realised on the Head. In the case of *bel*, *be-* is the lexical item merged in the specifier of the relevant functional projection, and the article-like inflection is the concord's realisation in the Head, as shown in (63)¹².



Modal adjectives

As said above, there are some adjectives that can only be prenominal. These all seem to have a “modal” value. Temporal adjectives (*future* ‘future’, *ex* ‘former’...), evidential adjectives such as *real* and *fake*, epistemic adjectives (*sedicente* ‘alleged’, *possibile* ‘possible’...), evidential adjectives (*vero* ‘true’, *falso* ‘fake’) belong to this group. Some modal adjectives are exclusively prenominal in their DM reading. In case they occur postnominally, they receive a predicative interpretation and are interpreted as indirect modification adjectives. The same interpretation is retained when the adjective is postcopular. Some others cannot be postnominal at all and are impossible in predicative structures; therefore, they are exclusively DM adjectives (64)-(65). Finally, some are DM in prenominal position and ambiguous in postnominal position (66).

(64) a. un **sedicente** erede
 an alleged heir

- b. *un erede **sedicente** (Cinque, 2010, p. 75)
 an heir alleged

¹² The same happens in some other prenominal modifiers in Italian, such as the demonstrative adjective *quel*.

- c. *quell'erede è **sedicente**
that heir is alleged
- (65) a. **l'ex** primo ministro
the former prime minister
- b. *il primo ministro **ex** (ivi)
the prime minister former
- c. *il primo ministro è **ex**
the prime minister is former
- (66) a. una **vera** pistola
a real gun
- b. una pistola **vera**
a gun real
- c. questa pistola è **vera**
this gun is real

Pre-cardinal adjectives

Cinque (2012) singles out some “pre-cardinal” adjectives, i.e. adjectives that precede cardinal numbers. Among these, we have *altro* ‘other’ and *solo, unico*, ‘only, unique’ (67). Cardinaletti & Giusti (2010) call them determiner-like adjectives and observe that they always occur prenominally. In the unmarked order, they are located both before possessives and cardinal adjectives (68).

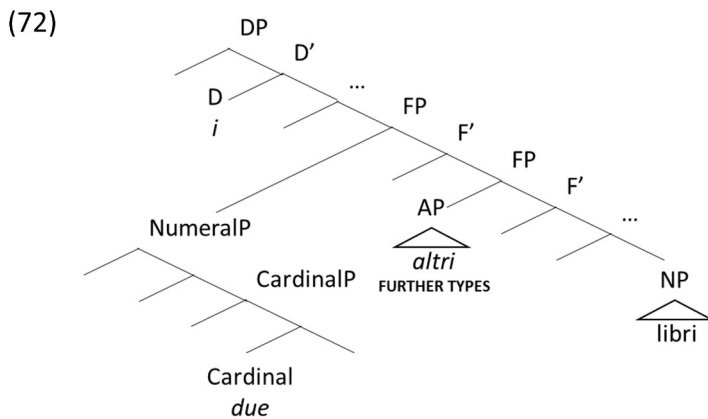
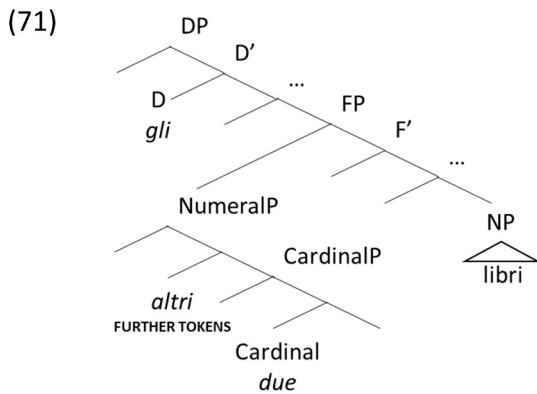
- (67) le **altre** due scarpe
the other two shoes
- (68) un'**altra** sua amica
another her friend
'another friend of her'

Furthermore, Cinque (2015a) discusses the existence of two distinct readings of *other*, as shown in (69). The reading in (69)a is ‘additive’: it adds further tokens of the same type. The one in (69)b, instead, has a ‘different’ reading, because it adds further tokens of a different type of the entity denoted by the noun. In example (70)a, two further syntax books are added to the discourse, whereas in example (70)b two further syntax books *of a different kind* are added to the discourse.

- (69) a. further token(s) of x (where x is some substance/entity/measure)
b. further type(s) of x (where x is some substance/entity/measure)
- (70) a. gli altri due libri di sintassi
the other two books on syntax
- b. i due altri libri di sintassi (Cinque, 2015a, p. 22)
the two other books on syntax

As evident from the examples above, in Italian *altro* with the ‘additive’ reading precedes cardinal numbers, whereas *altro* with the reading in (69)b follows them.

Cinque proposes that the additive *other* is merged in a NumeralP above the CardinalP (71). The ‘different’ type of *other*, instead, merges in a projection below the numeral (72).



Note that, when this is the case, *altro* precedes modal adjectives (cfr. the previous section); therefore, it is the highest adjective in the hierarchy (at least, among the ones considered in this study).

- (73) a. *i suoi due altri ex mariti*
 the her two other former husbands
 b. **i suoi due ex altri mariti*
 the her two former other husbands
 ‘her two other former husbands’
- (74) a. *quattro altre false banconote*
 four other fake banknotes
 b. **quattro false altre banconote*
 four fake other banknotes

Further properties

Adjectives in Italian can only be prenominal if they are unmodified. Adjectives modified by suffixes (75), comparative adjectives (76) and adjectives with a prepositional complement (77) are always found in postnominal (or in predicative) position. The only exception is superlative adjectives, which can also be prenominal (78)-(79). Coordinated adjectives can also be prenominal (80).

- | | |
|--|--|
| (75) a. una piccola scarpa
a little shoe | (78) a. un' altissima montagna
a very tall mountain |
| b. una scarpa piccolina
a shoe little-DIM | b. una montagna altissima
a mountain very tall |
| c. *una piccolina scarpa
a little.DIM shoe | (79) a. la montagna più alta d'Italia
the mountain tallest of Italy |
| (76) a. un alto grattacielo
a tall skyscraper | b. la più alta montagna d'Italia
the tallest mountain of Italy
'Italy's tallest mountain' |
| b. un grattacielo più alto (di questo)
a skyscraper taller (than this) | (80) a. una grande vittoria
a great victory |
| c. *?un più alto grattacielo
a taller skyscraper | b. una vittoria grande e splendida
a victory great and magnificent |
| (77) a. un piatto buono da mangiare
a dish good to eat | c. una grande e splendida vittoria
a great and magnificent victory |
| b. *un buono da mangiare piatto
a good to eat dish | |

Multiple adjectives

When two DM adjectives co-occur prenominally, their order is the English-like one, namely the order of merge (81). When two adjectives are postnominal, instead, their order is the mirror of the English one, such that the relative distance of the adjectives from the noun is preserved, as shown by the examples in (82).

- | | |
|--|--------------------|
| (81) le altre belle ragazze
the other pretty girls | |
| (82) a. un cane nero enorme
a dog black enormous
'an enormous black dog' | N < Colour < Size |
| b. un tavolo cinese rotondo
a table Chinese round
'una tavola cinese rotonda' | N < Origin < Shape |

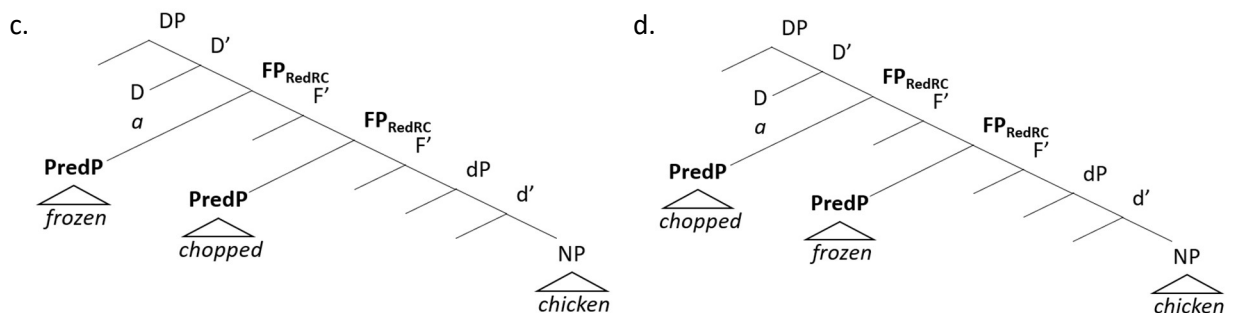
1.4 Indirect modification adjectives

1.4.1 Summary of the properties

We have seen that indirect modification, or predicative, adjectives modify the *extension* of the nominal expression; this property derives from their position of merge, namely as predicates of a Reduced RC. Two further properties derive from this: free ordering and scope.

Predicative adjectives are not ordered, unlike attributive ones, as the examples in (83) show¹³. However, the two expressions are not equivalent, because the outmost adjective takes scope over the other: (83)a refers to a chicken that was first chopped and then frozen, while (83)b refers to a chicken that was first frozen, and then chopped. The two structures are shown in (83)c,d¹⁴.

- (83) a. frozen chopped chicken
 b. chopped frozen chicken



Importantly, in Romance languages, where such adjectives are postnominal, the scope is reversed (see (84)-(85)): it is the second adjective, i.e., the outmost, that takes scope over the other, as the English translation shows. This supports the claim that the base-generation order is the same and that the observed order is derived via movement.

- (84) a. une personne **agée handicapée**
 a person elderly handicapped
 'a handicapped elderly person'
 b. une personne **handicapée agée**
 a person handicapped elderly
 'an elderly handicapped person'

(from Lamarche, cited by Alexiadou (2014, p. 102))

¹³ The example is taken from Svenonius (1994), where it is simply used to show scopal facts, and then repeated by other authors (i.e., Alexiadou, 2014). The predicative nature (and thus free ordering possibility) of such adjectives was noticed by Cinque.

¹⁴ I will use the label Pred(icative) P(hrase) to designate the relevant portion of structure. The identification of the maximal projection – whether CP, TP as in non-finite relatives, or another XP – is left to future research.

- (85) a. una persona **anziana** **disabile**
 a person elderly handicapped
 ‘a handicapped elderly person’
- b. una persona **disabile** **anziana**
 a person handicapped elderly
 ‘an elderly handicapped person’

It should not be forgotten that indirect modification adjectives can co-occur with direct modification ones. Therefore, many strings are ambiguous. If we consider once again the DP *a little red ball*, if no other specification is present, this string has three potential structures:

- (86) a. both adjectives are predicative (indirect modification)
 b. both adjectives are attributive (direct modification)
 c. *little* is predicative and *red* is attributive.

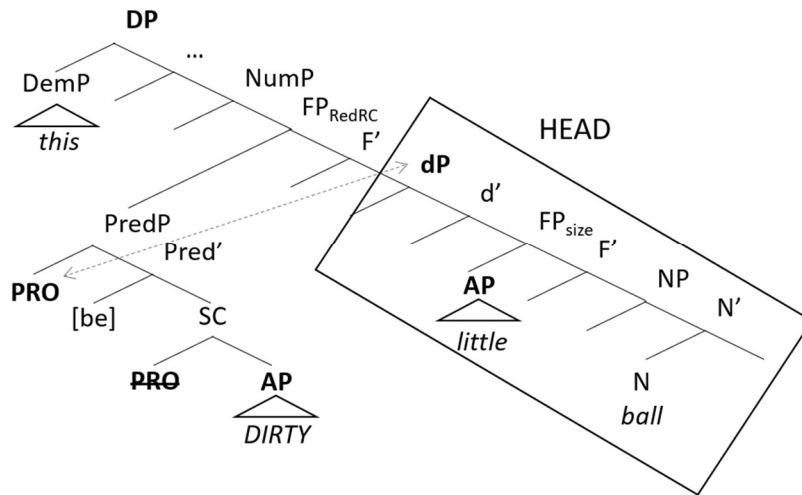
1.4.2 The relative clause source

As already mentioned, Cinque (2010) takes IM adjectives to be inserted as predicates of a relative clause (in the case of adjectives, the AP is the complement of a Pred(icate)P selecting a small clause (SC), as in (87) below). Cross-linguistic facts suggest that RedRCs are merged below numerals and, as seen, above a small dP, an indefinite projection.

The syntax of relative clauses has been a matter of lively debate. Cinque (2008, 2013) proposes a universal structure for relative clauses. In his proposal, the clause is merged preminally as the specifier of a functional projection in the Extended Projection of the noun. He further proves that the Head of the RC is neither the bare noun nor the NP alone, but a bigger constituent, namely the small dP¹⁵, which contains the noun plus the functional structure built above it, including the projections hosting direct modification adjectives. The *external* Head in the outer DP is matched by an *internal* Head inside the embedded clause. In reduced RCs, the external Head is matched inside the RC by a PRO, which is its subject (Cinque, 2010, p. 55). The proposed derivation would be the one in (87).

¹⁵ This analysis is valid for restrictive relatives and free relatives, whereas appositive relatives are headed by a full DP.

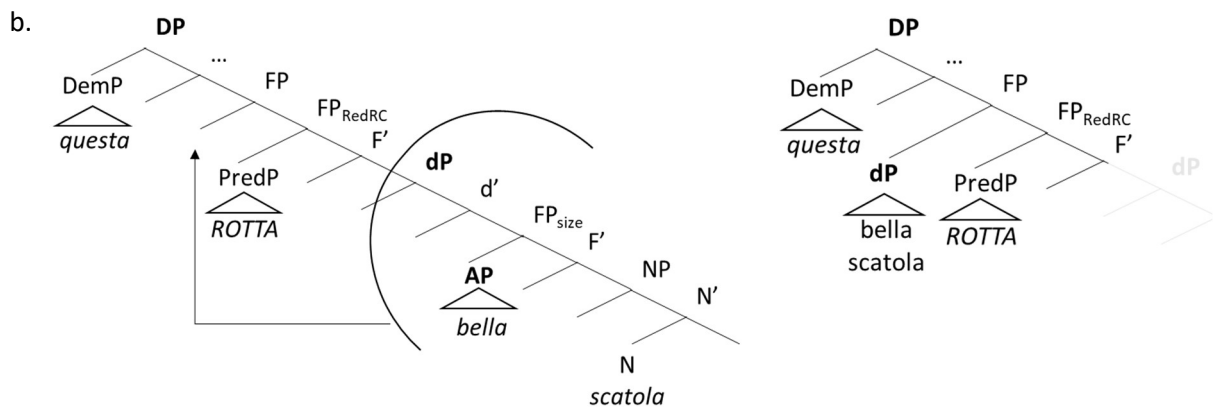
(87)



In languages like Italian, where RCs are postnominal, the Head raises to the specifier of a CP-like projection. When the external Head raises, we have a ‘matching’ derivation; when the internal Head raises, we have a ‘raising’ derivation.

Cinque proposes a matching derivation for RedRCs, i.e., it is the external Head that moves to a position higher than the relative clause (thus c-commanding it). Since the external Head corresponds to the dP, its raising crucially involves both the noun and all its DM adjectives, which are merged below dP. It does not matter whether they precede or follow the noun: in any case, they raise with it. This directly accounts for the fact that DM adjectives are always closer to the noun than IM ones.

(88) a. Questa bella scatola rotta
 this pretty box broken



1.5 Movement

We have seen how, in Cinque’s theory, two different types of adjectival modification are associated with different interpretative and syntactic properties. We have also seen that these properties co-occur with a different positioning of the adjective with respect to the noun: prenominal adjectives are exclusively direct modification (DM), and postnominal adjectives are either direct modification

or indirect modification (IM). Both types, however, are merged prenominaly. DM adjectives are merged below dP as specifiers of some functional projections; IM adjectives, instead, are predicates of a reduced Relative Clause merged higher than the dP but lower than numerals.

In a cartographic perspective, this order of Merge has been claimed to be universal. It does not, however, account for the observed orders in Italian: how can postnominal adjectives be explained? How can the superficial orders be derived?

A first possibility is that there is some directionality parameter governing the order of merge in each language, in such a way that the Head-Complement direction or the direction of attachment of the specifier are language-specific. This hypothesis has been much argued against. Indeed, ever since Kayne's (1994) Linear Correspondence Axiom, syntactic structures are taken to be exclusively left-branching. Besides, Cinque (2005) demonstrates that the attested orders of DP elements (determiners, numerals, adjectives) in the languages of the worlds, which are only a subset of the mathematically possible ones, are better explained if a universal order of base-generation (Det > Num > Adj) is combined with movement.

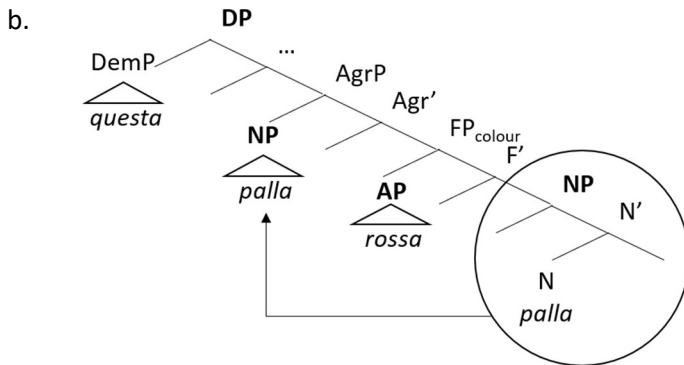
Therefore, movement is left as the fundamental factor of word order variation cross-linguistically (cfr. Svenonius, 2008). The complex patterns displayed by Italian adjectives are derived through the interaction of various kinds of movement (Cinque, 2010; cfr. also Laenzlinger, 2005a, 2005b).

Let us recall that most DM adjective are postnominal in Italian. Some obligatorily, such as origin, material and classificatory adjectives. Some are always postnominal in colloquial speech and can be prenominal in the formal/literary style, such as colour, shape and physical property, and some are optionally pre- or postnominal (value and size).

If the basic order is Adj – N, the noun must cross over the adjective to obtain the observed N – Adj linearization. In a first formulation, Cinque posited Head-movement of the noun to an intermediate projection above some of the adjectival projections (Cinque, 1994). Subsequently, other scholars and Cinque himself (Alexiadou, Haegeman, & Stavrou, 2007; Cinque, 2005; Laenzlinger, 2005a a. o.), turned to a phrasal movement account, according to which it is not the noun itself that moves to a higher head position, but the NP (or a larger constituent containing it) that raises to a specifier position. (cfr. Cinque, 2010, Chapter 1 for a discussion of the shortcomings of the N movement account). Phrasal movement involves the raising of a constituent to a Spec higher than the adjective, thus obtaining the desired order. What drives this movement? One proposal is that the noun, in languages with strong morphological noun-adjective agreement, needs to overtly check its

agreement features in an Agreement Projection (Laenzlinger, 2005a, 2005b). In any case, a projection hosting the moved XP is necessary between the AP-dedicated functional projections.

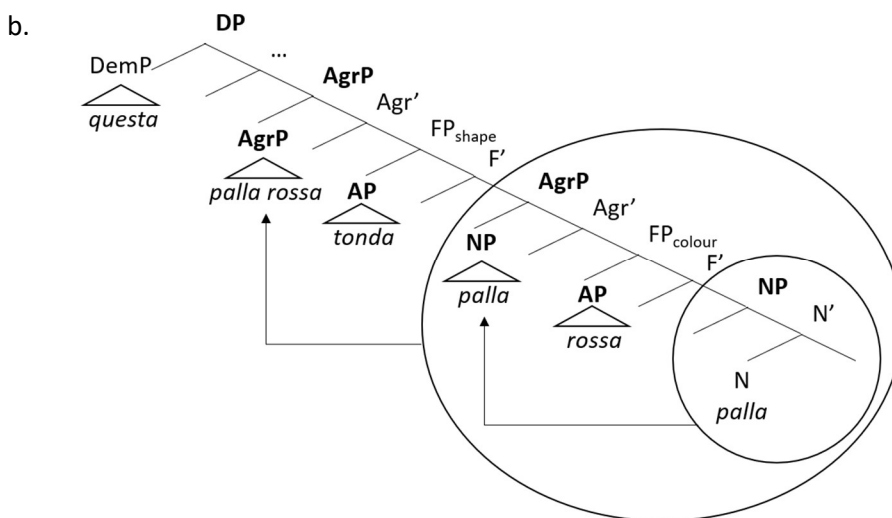
- (89) a. questa palla rossa
 this ball red
 'this red ball'



This kind of movement is obligatory with certain categories of adjectives (nationality, colour, shape), optional with others (size, value) and does not occur with some modals.

When multiple DM adjectives are present postnominally the linear order is reversed and is the mirror order of merge position. This obtains if the noun, after raising past the lower adjective, pied-pipes the agreement projection it is merged into and raises over the higher one, as shown in (90) (so called roll-up movement)¹⁶.

- (90) a. questa palla rossa tonda
 this ball red round
 'this round red ball'



¹⁶ In a recent proposal, Cinque takes not only postnominal, but also prenominal adjectives to be derived through pied-piping. Postnominal adjectives would be derived through *progressive pied-piping*, and prenominal ones through *regressive pied-piping* (Cinque, 2017). This proposal is taken into account in chapter 4.

not the case when the noun is modified by an adjective¹⁷, either pre- or postnominal (93)a,b. In general, a noun may be bare when it is not referential, but only denotational (94).

- (92) a. Che **bella** camicia!
how nice shirt
'What a nice shirt!'
- b. Che piedi **piccoli**!
how feet little
'What small feet!'
- (93) a. Gianni è avvocato
Gianni is lawyer
- b. *Gianni è avvocato bravo
Gianni is lawyer good
- c. *Gianni è bravo avvocato
Gianni is good lawyer
- (94) Questa si chiama patata
this CL call potato
'this is called a potato'

In argumental position, singular mass and plural count nouns may be bare when lexically governed¹⁸; in this case, they are interpreted as indefinite and existentially quantified NPs and their interpretation is similar to a DP introduced by a partitive article. In this case, the noun might be modified by an adjective, but only a postnominal one¹⁹.

- (95) a. Gianni mangia patate
Gianni eats potatoes
- b. Gianni mangia patate buone
Gianni eats potatoes good
- c. *Gianni mangia buone patate
Gianni eats good potatoes
- (96) a. Bevo acqua
drink water
'I drink water'
- b. Bevo acqua pulita
drink water clean
'I drink clean water'
- c. *Bevo buona acqua
drink good water

¹⁷ Except for classificatory/relational adjectives, which contribute to form the kind: *Gianni è ingegnere elettronico* 'Gianni is electronic engineer'.

¹⁸ The notion of government is not as clearly defined in current frameworks (minimalism, cartography) as it was in the Government and Binding framework. I will maintain the concept of *lexically governed* for descriptive and explanatory purposes, leaving open its formal implementation in the current system.

¹⁹ This is not always true for bare plurals. Factive predicates at the present tense such as *eat* (as in example (95)) do require the order N-pl ADJ and ban the order *ADJ N-pl. With [-factive] predicates and verbs at the past tense both orders are possible: ADJ Npl and Npl ADJ (i)-(ii).

- (i) Gianni chiede buoni risultati
Gianni demands good results
- (ii) Gianni mangiò buone patate
Gianni ate good potatoes

In contrast, singular count nouns may never be bare in argumental position.

- (97) a. *Gianni mangia patata
Gianni eats potato
- b. *Mela è un frutto sano
apple is a fruit healthy
'The apple is a healthy fruit'

Proper names (and other categories such as kinship terms, *unica*, etc) are not subject to the above restrictions, but can be determinerless in all positions. When they are, they precede any modifiers. Longobardi (1994) ascribes this to N-to-D movement: the noun is generated in N and raises to D because of its intrinsic referential nature, which it receives by raising to D. In a Cinquian approach, head movement of N is substituted for by phrasal movement of the NP to Spec,DP; because Italian does not allow doubly-filled Comp, the D head is empty.

- (98) a. E' venuto il **vecchio** Camerese.
came the older Camerese
- b. *E' venuto **vecchio** Camerese.
came older Camerese
- c. E' venuto Camerese **vecchio**.
came Camerese older
- d. E' venuto il Camerese **vecchio**.
came the Camerese older
- (99) a. **L'antica** Roma fu la città più importante
del Mediterraneo.
the ancient Rome was the most
important city of the Mediterranean
- b. ***Antica** Roma fu la città più importante del
Mediterraneo.
ancient Rome was the most important city of
the Mediterranean
- c. Roma **antica** fu la città più importante
del Mediterraneo.
Rome ancient was the most important
city of the Mediterranean
- d. La Roma **antica** fu la città più importante del
Mediterraneo.
the Rome ancient was the most important city
of the Mediterranean

(Longobardi, 1994, p. 624)

The same pattern holds for pronouns, in that they precede any modifiers, but they are generated directly in D, therefore no raising is involved.

1.6.2 Pronominal constructions

Adjectives in Italian can also occur in DPs without a lexicalised noun, i.e., in which the noun is omitted. Various separate cases will be analysed in this section.

A first possibility is the indefinite null nominal construction, as analysed by Bernstein (1993). Some examples are shown in (100).

- (100) a. uno piccolo
one little
'a little one'
- b. uno verde
one green
'a green one'
- c. una bella
one-FEM beautiful-FEM
'a beautiful one'

The adjective appears after the element *uno/una* (masculine/feminine form), which is homophonous with the numeral 'one' and with some forms of the indefinite article. The feminine form is identical to the article, whereas the masculine form of the determiner is *un* or *uno* according to the phonological environment. As the glosses show, this construction can be translated with 'a(n) Adj one' in English. A fundamental property is that adjectives that enter it always receive a predicative interpretation. In the examples in (100), the adjectives are interpreted restrictively (i.e., as indirect modification ones). This property is further confirmed by the fact that those adjectives that cannot appear in predicative position are also impossible in this construction. Besides, adjectives like *falso* only retain their non-privative reading.

- (101) a. *uno sedicente
one alleged
'an alleged one'
- b. uno falso (= un amico falso 'a hypocritical friend')
a false
'a false one'

Bernstein's interpretation of these facts is as follows: she analyses the element *uno* as composed by the indefinite determiner *un* (which she takes as the base form) plus the 'word marker' *-o/-a*, a suffixal element carrying the features of gender and number marking. The true pronominalized element, in her account, is only this word marker, which generates low in the structure and raises to D via head-movement. I will not follow Bernstein here; instead, I will assume *uno* to be the pronominalized element itself, as hinted in Bianchi (1999). The indefinite construction is often involved in *ne* cliticization, as shown in (102).

- (102) ce n'è uno piccolo
there CL is one little
'there is a little one'

A similar definite structure can be construed with the distal demonstrative adjective (see examples (103)). As in the indefinite null nominal construction, the adjective is interpreted restrictively; thus, it is the predicate of a reduced relative. Note that *quello*, when used in this way, loses at least part

of its deictic function. This can be seen in the English translation: the proper counterpart is not ‘that red one’, but generically ‘the red one’. Interestingly, the same demonstrative element is used as the Head of light-headed Relative Clauses (104). This observation does not hold when the proximal demonstrative is involved. The definite null nominal construction may also be construed with the proximal demonstrative, but the difference is clear with respect to the requirement for the referent’s presence in the context: the expressions in (103) can be uttered in any situation, also when the referent is not present; the one in (105), instead, can only refer to a referent that is present and near.

- | | | |
|-------|--|---|
| (103) | a. quello piccolo
that little
‘the little one’ | c. quella bella
that-FEM beautiful-FEM
‘the beautiful one’ |
| | b. quello verde
that green
‘the green one’ | |
| (104) | a. Che libro vuoi?
‘which book do you want?’ | b. Quello rosso
that red
‘the red one’ |
| | | c. Quello che ti ha regalato Gianni
that that to.you has gifted Gianni
‘the one that Gianni gifted you’ |
| (105) | Questo rosso
‘this red one’ | |

A third type of noun-less DP involves the pre-cardinal adjective *altro*. In this case, the determiner is the definite or indefinite article (compare (106)a,c and (106)b,d), and the pronominal element is likely *altro* itself, which can also be pronominalized by itself, without the determiner (107).

- | | | |
|-------|--|--|
| (106) | a. un altro libro
an other book
‘another book’ | c. un altro
an other
‘another one’ |
| | b. l’altro libro
the other book | d. l’altro
the other
‘the other one’ |
| (107) | vuoi altro?
want-2SG other?
‘would you like something else?’ | |

A similar construction occurs with descriptive adjectives, preceded by the article. Unlike the case with *uno* and *quello*, these adjectives are not interpreted as IM, but as DM: they identify the referent

with the property expressed by the adjective. So *i piccoli* means for example ‘the little children’, *il verde* ‘the green pen’. I take these expressions to involve deletion of the noun: *i piccoli ~~bambini~~*, *un verde ~~colore~~*²⁰, which occurs before any movement takes place. The absence of NP movement past the adjective means that the noun does not intervene between the determiner and the adjective itself; this explains why the article shows the typical phonologically conditioned allomorphy in front of the adjective. This contrasts with the pronominal constructions seen above; the difference is illustrated in (109)a,b.

- | | | | | |
|-------|----|---|----|---|
| (108) | a. | <i>i piccoli</i>
the little | c. | <i>un piccolo</i>
a little |
| | b. | <i>il verde</i>
the green | d. | <i>un verde</i>
a green |
| (109) | a. | <i>una arancione</i>
‘an orange one’ | b. | <i>un’arancione [colore]</i>
‘an orange’ |

1.7 Conclusions

In this chapter, I have reviewed the literature concerning some important aspects in the syntax of adjectives. There are two kinds of modification, a direct modification one and in indirect modification one, as has been observed by many authors. I adopt Cinque’s (2010) syntactic implementation of this divide, assuming that direct modifiers are phrasal and are merged as specifiers of functional projections, whereas indirect modifiers are predicates of a reduced Relative Clause. In a cartographic perspective, each type of modifier is merged prenominal in a different projection, DM adjectives below dP, an indefinite projection, and IM ones above dP and below NumP. The word order patterns observed in Italian are a result of the interaction of various movements. DM adjectives may be either prenominal or postnominal, depending on the class they belong (and possibly to lexically specific patterns); this position is due to roll-up movement (obtained through structural pied-piping). IM adjectives are exclusively postnominal due to the obligatory raising of dP past them.

A further point that has been discussed is that of AORs, which, in the perspective adopted here, are a feature of DM. This syntactic phenomenon suggests that semantic classes have a syntactic

²⁰ I leave the possibility open whether the deletion occurs already in the syntax or in the discourse, as this does not affect much the analysis.

importance for direct modification, although their number and nature has not been determined yet. In this study, I will assume that at least some major classification is syntactically specified in the structure of the DP; in the most general case, it will be the tripartite structure proposed by Svenonius (2008); I leave open the issue of how detailed the hierarchy should be.

What predictions may be made for acquisition? The question is not trivial, as acquisition data may not be refined enough to observe the complexity and variety of the patterns considered above. What is more, many adjectives are ambiguous between the two sources, therefore, they may not be distinguishable.

A first prediction that may be drawn is that indirect modification entails predication; therefore, the availability for the child of IM adjectives in the DP will be subject to their availability in predicative position. More generally, the acquisition of predicative position should precede that of indirect modification.

Concerning the relation between direct and indirect modification, DM should precede IM. This comes for two reasons. As seen above, DM adjectives modify something that is still predicative in nature; they modify some traits of the meaning of the noun. Conversely, IM adjectives represent a further predication of a property that needs to be computed; thus, the whole DP is semantically a combination of properties that might be more difficult to compute for the child. Syntactically, IM adjectives are also more complex. While DM adjectives merge directly as specifiers of a nominal projection, IM ones are predicates of a reduced relative clause. Thus, the syntax of relative clauses must be available to the child, and the mechanism of reduction could be a factor of increased difficulty instead of higher simplicity. Therefore, the two implicational in (110) scales emerge.

- (110) a. DM < IM
b. Pred < IM

A further point that emerges is that semantic classes are not only a lexical fact, but they have an import for the syntax of adjectives and of the DP. If this is the case, a study of the syntactic acquisition of adjectives should first consider the acquisition of semantic-lexical classes, and then consider their relevance for the acquisition of the adjective in the DP. If the theory is correct, the syntax-semantics mapping should play a role.

In conclusion, the following research questions may be posed:

1. How do children acquire the semantics of adjectives?
2. How do children acquire the syntax of adjectives?

3. How do children acquire the alleged syntax-semantics mapping?

In the next chapter, I will review the state of the art on some issues that relate to the questions above.

Chapter 2. The acquisition of adjectives

2.1 Introduction

From the previous chapter, the following research questions have emerged:

1. How do children acquire the semantics of adjectives?
2. How do children acquire the syntax of adjectives?
3. How do children acquire the alleged syntax-semantics mapping?

These questions will be examined in turn in the present chapter through a review of the existing literature.

As regards the first question, recent research has focused mainly on the lexical and semantic acquisition of adjectives, studying how children discover and build the semantic domain proper of adjectives (i.e., properties) and how they start mapping words to world properties (section 2.2), on the one hand, and how they classify them into semantic-conceptual class on the other (section 2.3).

Preliminary to the second question is the issue of how children acquire the DP in Italian and how this bears on adjectival modification. Section 2.4 reviews some literature on the crosslinguistic acquisition of the DP and its interaction with adjectives, and in section 2.5 the state of the art on the acquisition of adjectival syntax is discussed. In the first part some cross-linguistic studies on the acquisition of morphosyntax and syntax-semantics mapping are presented, and in the second part one study on Italian based on Cinque's work is reviewed (Cardinaletti & Giusti, 2010).

In section 2.6 I discuss some tentative hypotheses on how a cartographic approach to syntax may relate to language acquisition. Finally, section 2.7 summarizes the predictions that emerged in the first two chapters and poses specific questions for the analysis here carried out.

2.2 The acquisition of the meaning of adjectives: mapping words to properties

The first question I address is how children acquire the semantics of adjectives. In this section I will examine some previous studies investigating the acquisition of the adjective lexicon and of semantic-conceptual classes. A large share of works on adjectival semantics focuses on how children

map adjectives onto the world properties they denote; although this is not the focus of this study, I will make some reference to the existing literature on word-to-world mapping of adjectives.

Experimental work offers some insight as to how children start acquiring the lexicon and what properties of the input are relevant for them. A comprehension study by Waxman & Booth (2001) shows that 14-month-olds know that count nouns typically denote objects and adjectives typically denote object properties. Through two experiments, Waxman and Booth found that two groups of English-speaking 14-month-old infants presented with the same set of objects grouped them differently based on the naming they were given. Two conditions were tested, the Noun condition and the Adjective condition. Children in both conditions were given a set of objects to familiarize with (e.g., four purple horses), accompanied by a sentence. Children in the Noun condition were presented the objects with the sentence 'This is a blicket', with the novel word preceded by an indefinite article, and children in the Adjective condition were presented the objects with the sentence 'This is blickish', without the article and with the novel word presenting typical adjectival morphology. Children in the Noun condition showed that they had identified the four objects based on their object category, whereas children in the Adjective condition had correctly identified the novel word as denoting their common property (and could recognise other purple objects). This study importantly highlights that infants at this age not only have learnt that adjectives and noun are two different word classes, but also that they map to the world in a different way: nouns map to object categories and adjectives to object properties. Further, and more importantly for our purpose, children show that they can exploit grammatical information to recognise adjectives. In the familiarisation phase, children are presented the novel word in a predicative construction and with typical adjectival morphology (*This is blickish*); in the test phase, the adjective is used instead in a pronominal DP (*Can you give me the blickish one?*). This suggests that at 14 months of age English-acquiring children are already familiar with the grammatical form of the adjective (and possibly its syntactic environment) in their target language and can exploit this information to determine the category of a novel word. The authors are however cautious in interpreting this result, advancing the possibility that the main distinction that children operate is between nouns (denoting objects) and predicates in general (adjectives and verbs).

An additional example of experimental work on the early discovery of adjectival meaning has been conducted by Waxman & Guasti (2009). The purpose of this work is to bring further proof to Waxman, Senghas, & Benveniste's (1997) experiment, which compared the performance of English,

French and Spanish children. This early work moved from the intuition that the acquisition of the meaning of adjectives is influenced by language-specific syntactic properties. The authors observed that the three languages differ in the phenomenon of noun dropping. English and French very rarely allow the noun to be dropped (as in ‘the wealthy’), whereas constructions with a dropped noun are ubiquitous in Spanish, resulting in a high number of Det(erminer)-A(djective) constructions. However, a single word inflected for number and gender preceded by a determiner is a syntactic context typical of nouns. As a result, Spanish-speaking children might conclude that adjectives are associated with both property-based and category-based meanings. Their results supported this prediction²¹. To provide further evidence to this finding, Waxman & Guasti (2009) repeated this experiment with Italian children. Like Spanish, Italian allows Det-A constructions quite frequently (see chapter 1, section 1.6.2). Waxman & Guasti tested 45 3-year-olds and 45 5-year-olds. The children were shown a picture book with 5 pictures in each page. The central one was the target stimulus; two pictures were thematically related with it and two pictures belonged to the same category. The children were assigned to three conditions: the No Word condition, the Novel Noun condition and the Novel Adjective condition. Children in the No Word condition were shown the central picture and asked to choose another one: “Camilla told me to show you this. Now can you show me another thing?”. This was repeated for twelve items; at the end of the book the experimenter would show the whole book again asking: “Remember that I showed you this and you showed me this? Can you show me another thing again?”. Children in the Novel Noun condition received the same treatment, except that the target stimulus was presented with a novel noun: “Camilla mi ha detto che questo/a è un/una fapole. Mi fai vedere un/an’altro/a fapole?” (Camilla told me that this is a *fapole*. Can you show me another *fapole*?). Similarly, in the Novel Adjective condition the novel word was presented in an adjectival context; “Camilla mi ha detto che questa è una cosa faposa. Me ne fai vedere un’altra faposa?” (Camilla told me that this is a fopish thing. Can you show me another fopish one?).

The prediction was that, if Italian children (like Spanish ones and differently from English and French ones) associate adjectives with both property- and category-based commonalities, they should choose categorially similar test items also in the Novel Adjective condition. This prediction was found to be correct. Children chose test items at chance in the No Word condition and based on

²¹ I did not report the details of the experiment because it was substantially similar to the one replicated by Waxman & Guasti (2009) for Italian.

categorial commonality in both Novel Adjective and Novel Noun condition. However, the choice for categorially similar items was significantly higher in the Novel Noun condition. Thus, the authors conclude that Italian and Spanish children, due to the high frequency of Det-A constructions, associate adjectives both with properties and with object categories, but know the difference between adjectives and noun.

This, however, is not to say that the two options are equal. The experiment did not provide an option for grouping the items based on a property; it is possible (and likely) that, had this been the case, the children would have chosen items with the same property as the target item. As the authors acknowledge, the link between adjectives and properties remains primary (Waxman & Guasti, 2009, p. 64)

We have seen that after their first year of age, English-speaking children already have at least a partial knowledge of the category of adjectives and its semantic core (mapping to properties). Two further steps should follow. On the one hand, at some point children need to start mapping more precisely the meaning of a single adjective to the specific property it denotes. What does it mean to be red? Where does red end and orange begin? What does it mean to be big? Notice that the two examples involve very different problems. Mapping colours to visual properties is one thing; discovering the properties of a gradable adjective is quite another and involves setting a standard of comparison. On the other hand, children should start grouping adjectives into semantic classes. As we have seen, semantic-conceptual classes are relevant for some syntactic properties of adjectives, and therefore they must be acquired sooner or later.

In which order are these two steps taken? There is more than one possibility. The acquisition of the meaning of specific adjectives may provide the starting point to the forming of semantic-conceptual classes based on similarities between the properties that the adjectives denote. In alternative, it might happen that the discovery of the class to which an adjective belongs precedes and helps its precise semantic mapping. For instance, a child might discover that the adjective *small* belongs to the Size class, thus acquiring only a general semantic indication of its meaning, without being able to correctly identify an object as small. A last alternative is that these are two sides of the same coin, such that the first semantic acquisition supports the forming of the semantic classes, and their availability for the learner facilitates the acquisition of novel words.

The semantic acquisition of adjectives has been investigated in Tribushinina, Voeikova, & Noccetti (2015). In the many contributions to this book, various researchers investigate the acquisition of

adjectival semantics and morphology in a crosslinguistic perspective. In the introduction, the editors point out some potential challenges to the acquisition of word-to-world mapping for adjectives. First, adjectives, as already said, map to properties of objects; even in case a child has understood that a novel word refers to a property, it might be dubious to which specific property of the object the novel word refers. Second, adjectives are generally less numerous than nouns and verbs in the input. Finally, adjectives depend on nouns both for their form (in Italian adjectives agree in number and gender) and for their meaning.

Additionally, some language-specific factors might render the acquisition easier or more difficult. A study is reported in which the acquisition of adjective meaning was influenced by word order, showing that the postnominal position is more salient for English-speaking 2-year-olds, for whom this order is ungrammatical.

The crucial age for adjective acquisition is approximately between 1;08 (one year and eight months) and 3;00, age at which a vocabulary spurt in the adjective lexicon happens. To account for the acquisition of meaning, Tribushinina et al. propose a semantic hypothesis²², which consists of the idea that the meaning of an adjective is made clear to a learner through contrast information. Children have been shown to rely both on perceptual contrast and on linguistic contrast (cfr. Tribushinina et al., 2015 and references cited there). Linguistic contrast consists of antonymic pairs (hot-cold, big-small) and of contrast sets (such as colours). The works in the book test this hypothesis for eleven languages.

Nocetti (2015), in one of the chapters, carries out a comparative analysis of two English and two Italian children. The English children are Warren and Anne, both recorded every three weeks in the period 1;10-2;09. The Italian children are Camillo (2;0-3;6) and Rosa (1;7-3;4). Nocetti investigates the acquisition of adjectival semantics and morphology, comparing English and Italian on the one hand and child speech (CS) and child directed speech (CDS, i.e. parental input) on the other. I will concentrate on the Italian results here. Nocetti finds some relevant periods in the development of adjective use, a first around age 2;00, a second between 2;3 and 2;4, a third at 2;7-;8 and a fourth between 3;0 and 3;4. In these periods some increases in adjective production are observed. In the first period, Nocetti claims that until age 2;00 adjectives are rote-learned and mainly used in

²² A morphological hypothesis is also tested throughout the book, namely that phonological properties of adjective and noun inflection bootstraps the acquisition of adjectival morphology. Since the acquisition of morphology is not investigated here, I will not discuss this further assumption.

isolation; one child (Camillo) matches them in number and gender with the associated object, but they occur at first only in one form of the paradigm and are taken to be unanalysed. The girl (Rosa), instead, does not show correct number and gender agreement until age 2;1. A further important finding is that morphosyntactic acquisition precedes an accurate word-to-world mapping of meaning. The two children, for instance, seem to have fully acquired the meaning of *small* and *big* only at age 2;5, but they start producing them much earlier. Also colour adjectives are often used randomly until 2;8, meaning that the children cannot map the colour words to the relevant property until this age. What is crucial, however, is that these lexical items have already been acquired long before their meaning is fully understood; they have been identified as adjectives, their morphological paradigm is productive, and they have been sorted in the correct semantic class. Accordingly, although *grande* 'big' is used interchangeably with big and small objects, it is used to refer to the *size* of the object, albeit the wrong one. Likewise, when children are asked what colour an object is, they may answer with a totally wrong colour, but they will use a colour word.

How can this result be explained? A first possibility is that a core semantic feature is identified for that adjective, such that the adjective is assigned to a semantic class prior to the definition of its precise meaning. A second possibility is that a classification is obtained through other means, such that adjectives are first grouped together based on their morphosyntactic behaviour and later assigned a core semantic property. Boleda, Badia, & Batlle (2004) conducted a clustering experiment based on the latter hypothesis. They found that broad semantic classes of adjectives may be partially predicted by their shallow syntactic environment (i.e., the type of words that surround them)²³. If children were able to compute the same operation, they would be able to group adjectives together first, and then to assign them a semantic feature. This experiment, however, used a very broad semantic distinction; further research is needed to determine whether the same result may be obtained with the lexical-semantic classes which are considered here. This issue is left open for future research.

Going back to Noccetti (2015), the question remains open of how children acquire the exact meaning of an adjective. Both for English and for Italian data, the prediction of the semantic hypothesis explored in Tribushinina et al. (2015) seems to be borne out: the acquisition of meaning

²³ I refer to the article for the details of the experiment.

is easier if adjectives are contrasted as members of antonymic pairs (*grande* ‘big’ – *piccolo* ‘small’) or members of contrastive sets (colour words).

2.3 Acquisition of lexical-semantic classes

I turn now to the acquisition of adjective classes. A recent cross-linguistic study on the acquisition of adjective frequencies across semantic classes was conducted by an international group (Tribushinina et al., 2014), investigating the development of adjective use by children and caregivers as a function of age and semantic class. A longitudinal study on five languages was carried out (Dutch, German, French, Hebrew and Turkish). The spontaneous speech of two children for each language (age: 1;08-2;08) and that of their caregivers was examined.

Adjectives were extracted and coded for semantic class, with a classification based on Blackwell’s (2005), but with substantial differences. Blackwell conducted a corpus study on two children in the CHILDES database, Adam and Sarah, from age 2;3 and 5;0. She classified adjectives based on Dixon’s hierarchy (Value, Age, Colour, Physical property, Human propensity, Speed, Dimension, Other); she split some of them in several subclasses. The Other class (i.e., the class containing adjectives that couldn’t be accommodated in any of the other classes) was conspicuous, consisting of fourteen subclasses.

With respect to Blackwell’s classification, Tribushinina et al. split the human propensity class into three classes (behavioural property, internal states and physical states) and add a few others (conformity to a standard, modal, ordinal, quantitative, temporal), thus reducing the ‘other’ category. This classification has the great advantage of yielding a very small ‘other’ class. As an example of unclassified adjectives, *electric* and *Japanese* are given, i.e., an adjective of origin and a classificatory adjective. However, there is also a drawback: this classification does not relate in any way to the syntactic behaviour of adjective classes that have been discussed in chapter 1. Because Tribushinina et al. are only interested in the lexical-semantic behaviour of adjectives, they are not interested in the syntactic aspect of it. Thus, for example, *shape* adjectives are put within the physical property class, but this would not be consistent with AORs, which hold cross-linguistically and in which shape adjectives are placed between age and colour adjectives, and not together with other physical property adjectives.

A statistical analysis of adjective production was carried out, taking into account the effect of age, semantic class and individual differences. The authors found that adjectives emerge towards the end of the second year and are acquired at a high pace between age 2-3; adjective use generally increases over age, but with differences between children (one child had a high frequency at first and then showed a decrease). Furthermore, the correlation between adjective use in CS and CDS is very high at the beginning and decreases over time; a sharp decline is visible around 850 days (ca. 2;05). Therefore, children seem to develop their own preferences as they advance in the acquisition.

A more refined analysis, including semantic classes, shows that the development of each semantic class is not uniform. Classes frequently produced are physical state, colour, spatial (which include dimension), evaluative and physical property. Other classes were infrequent and produced by only one or two children (age, behaviour, internal state, conformity, temporal; modal adjectives were used by Hebrew-speaking children because they are very frequent in the target language). Although there was some language-specific difference, the composition of the adjective lexicon in the five languages was remarkably similar.

In general, they found that adjective classes could be divided into two groups. One, denoting abstract properties, is characterised by infrequent use and no change over time. The other group is formed by classes denoting concrete concepts, or concepts that are prominent for two-year-olds, such as colour, shape, dimension and evaluation. These classes have a more frequent use and show a development over time. The physical property class stands out from these two groups. Although it includes the most frequently used adjectives, which denote concrete properties, it does not show a development over time. The authors propose that this is due to the heterogeneity of the class, which includes many subclasses; if it were to be split into smaller categories the results would probably yield a clearer pattern.

2.4 Acquisition of the DP

The second and third research questions ask how children acquire the syntax of the adjective and how they realise the syntax-semantics mapping. Because one of the main syntactic functions of adjectives is the adnominal one, I will first look at the acquisition of the DP in general. In this section I will discuss the findings on the acquisition of three languages, German (Eisenbeiss, 2000), Modern Greek (Marinis, 2003) and Italian (Belletti & Guasti, 2015; Gallina, 2018). In section 2.5 I will discuss some works on the syntactic acquisition of adjectives.

2.4.1 Crosslinguistic research

Eisenbeiss (2000) investigates the acquisition of the German DP, proposing a Lexical Learning Approach. This approach moves from the observation that early productions seem to be underspecified for some features with respect to the adult language, and proposes that “children are equipped with an inventory of potential grammatical features” which “function as predispositions for the categorization of syntactic and morphological elements” (Eisenbeiss, 2000, p. 32). They are activated once the child detects some small cues in the speech pointing to their presence, then endowed to single lexical entries and finally mapped onto syntax following UG mechanisms (Eisenbeiss assumes a minimalist framework). Therefore, the acquisition of the DP is stepwise and depends on the child’s need to accommodate newly learned lexical and morphological elements; there is a stage in the acquisition of syntax that is lexically restricted.

In this perspective, she examines the longitudinal production of seven monolingual children, covering an age range between 1;11 – 3;06 (five corpora are longitudinal and two are cross-sectional). Possessive constructions are analysed first; definite articles follow. I will concentrate on the analysis of early articles here.

Eisenbeiss’ prediction is that, if the DP category is not yet instantiated in the earliest grammar, early determiners should be impostors, i.e., ‘unanalysed parts of formulae such as *wo’s-der+N* ('where's-the+N'), unanalysed parts of fixed det+N units (e.g. *der+papa*, 'the+daddy'), or unanalysed fillers, which children insert to mimic the prosodic structure of the target language.’ (Eisenbeiss, 2000, p. 38). Besides, their presence should be signalled by a U-shaped developmental curve. This consists in an early production that is target-like but consists of the stored unanalysed formulae just cited, followed by a drop in the production once the child recognises a rule but is not yet able to reproduce it, and finally a return to target forms, this time in a productive way. An important prediction is that impostor articles should not be combined with adjectives, because they would break up the fixed formula, since adjectives are prenominal in German.

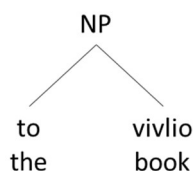
This is indeed what Eisenbeiss finds: in four of the children analysed a U-shaped curve in the production of determiners is found; early determiners are mainly found in formulaic expressions and in restricted contexts. Furthermore, for the same children, in the phase in which early determiners are impostors there is no (or very low) co-occurrence of determiners and adjectives.

Eisenbeiss does not specify the precise age of each recording, but an approximation can be made²⁴. Leonie has a 100% article omission in front of adjectives in the first two files (presumably 1;11-2;00) and between 95 and 100% until the 6th file (around 2;04?). Annelie and Hannah omit determiners in their first four files (2;00-2;04? Hannah, 2;4-2;7? Annelie). The children whose speech is more advanced and who do not show an early phase of impostor determiners also do not have this alternation.

An analysis of the acquisition of the Modern Greek DP has been carried out by Marinis (2003). Marinis analyses the speech of five children, Spiros (1 recording, 1;9), Janna (3 recordings, 1;11-2;9), Mairi (3 recordings, 1;9-2;9) and Maria (3 recordings 2;3-2;9) from the Stephany Corpus and Christos from the Christofidou Corpus (details in Marinis, 2003, p. 38). The first were recorded at only one, two or three points in time with many months in between, thus providing only cross-sectional information, whereas Christos' recordings are on a weekly basis, thus allowing a developmental analysis.

Marinis investigates the acquisition of the Greek DP in two main aspects: the acquisition of determiners and the development of some DP related phenomena (acquisition of possessives, of determiner spreading and of appositive constructions involving kinship terms and proper names). His conclusion is similar to Eisenbeiss', namely that the acquisition of the DP is incremental and is preceded by a period in which definite articles are impostors. One of the children, Christos, whose files start at an earlier stage, shows a first period of total absence of definite articles from obligatory contexts; he produces them afterwards, but a U-shaped curve in his production suggests that he is at a stage in which articles are not used as determiners. The U shape (the decrease in production followed by a productive use) is found at age 1;11, thus Christos produces articles in a target-like way from age 2;00. Marinis concludes that at Stage 1 the structural representation is the one in (1)a for structures with a lexically based definite article and (1)b when there is article omission.

(1) a.



b.

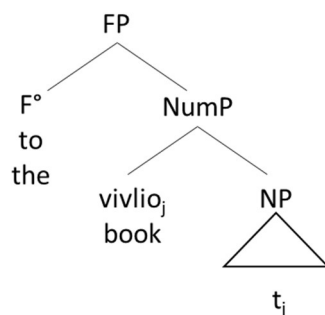


(Marinis, 2003, p. 99)

²⁴ Eisenbeiss provides the first and last age of recording and the number of files. Assuming a fairly regular interval between one recording and the other, an estimate of one per month turns out. Annelie: age range 2;4-2;9, 8 files. Leonie 1;11-2;11, 15 files. Hannah 2;00-2;07, 8 files. Mathias 2;03-3;06, 18 files.

Marinis adopts an analysis of the Greek DP that is composed of only four layers: NP, NumP, hosting the number feature, FP, hosting the case feature and generating definite articles and DP, that gives definiteness and hosts indefinite articles and demonstratives. Based on this analysis, Marinis finds that the DP is built in a step-wise fashion and bottom-up. The case and number features start to be realised by Christos at age 1;11, when articles transition from being impostors to being real determiners. This shows that NumP and FP have been projected, yielding the intermediate structure in (2).

(2)



(Marinis, 2003, p. 131)

Marinis argues that it is not possible to know whether the DP layer is available at this stage; the first piece of evidence is the presence of indefinite determiners, from age 2;01. At least from this moment, the child projects a full DP as in the adult language, with an indefinite determiner generated in DP or a definite determiner moved there from F°.

In the remainder of the book, Marinis examines some DP phenomena (Determiner Spreading, Possessive etc) which, in some cases, involve movement to Spec,DP and should therefore account for the activation of the DP layer and the availability of movement. He finds that word orders involving movement are acquired later than orders not requiring it (e.g., in possessive constructions the order possessor > possessum appears later than the reverse), and that more marked phenomena appear later than less marked ones (e.g., genitive case is acquired later than nominative and accusative). Marinis concludes that these results are compatible with a weak continuity hypothesis, according to which language development is given by the interaction of the language faculty with the input, and not subject to maturation. In this perspective, the structure is built bottom-up; the projections, even when they are already built, may be underspecified for some features in early grammatical representations.

Marinis' study gives important insight in the development of the DP in a single language, comparing the predictions of various hypotheses and exploring the implications for acquisition and linguistic

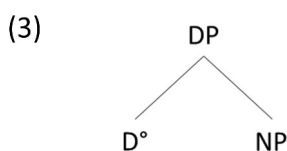
theory. Although the theory on the structure of the DP adopted in this work differs in many respects and is much richer, this perspective will be taken up again at the end of this chapter.

For the time being, I will consider the results concerning the acquisition of the definite article, which correspond to Eisenbeiss' (2000). Greek children, as German children, pass an early phase at which either they omit articles or use them as impostors. In both cases, this has been interpreted as proof that the DP layer is not yet projected.

2.4.2 Acquisition of the Italian DP

In a chapter on the acquisition of articles, Belletti & Guasti (2015) report rather different findings for Italian. Articles in Italian are proclitic to the following word; they do not have a uniform paradigm, but have several allophonic variants based on the shape of the following word. In the earliest stages of acquisition, Italian children produce monosyllabic placeholders (e.g. [e], [a]) substituting for functional words such as articles, prepositions, clitics and copulas. In contrast to Greek and German children, a stage at which articles are not produced at all is hardly found; instead, from the outset article omission co-occurs with optional production of either placeholders or articles. Articles are found to be used already at 1;06; the acquisition shows a clear development and ends around age 3;00 with nearly adult-like use. Nevertheless, even children at the lowest stage of development use articles between 28% and 45% of the times.

In comparing article omission with German and Dutch, Belletti & Guasti offer an account different from Eisenbeiss and Marinis'. While the latter analyse early articles as impostors, the first analyse article omission as a prosodic fact. Importantly, Belletti & Guasti consider placeholders as substitutes for only closed-class words; hence, they already project a functional category, which, in the case of articles, would be a DP:



(Belletti & Guasti, 2015, p. 51)

At least in early productions, articles are omitted based on the prosodic form of the following word (see Belletti & Guasti, 2015, par. 2.4 and references cited there). At first, children produce the article only in front of disyllabic words (Sw), thus obtaining the foot (wSw). At the same time, children start producing trisyllabic words (wSw), which remain bare. Therefore, children can put articles before a

(Sw) word because they can produce the resulting prosodic foot (wSw). Only at later stage can the child produce articles before trisyllabic words, thus obtaining a (wwSw) foot. However, even when they are able to produce the prosodic context, children keep omitting articles; therefore, this explanation only holds for early omission. Some further explanation is needed for later behaviour.

Belletti & Guasti propose a multi-facets explanation towards article omission. On the one hand, a subject-object asymmetry is observed. Articles in subject position are omitted with higher frequency than in object position, and the omission rate in subject position resemble that of DPs in isolation. One proposal has been advanced to account for it in prosodic terms, such that when the DP is an object the article may be resyllabified with the preceding verb, whereas, when the DP is a subject, the syntactic and the prosodic structure are not integrated as easily.

This hypothesis does not account for the whole data. A further possible interpretation is that children omit articles based on a missetting of the parameter involved in the distribution of bare nouns in a language (I refer to the chapter for details).

Another context with high article omission is after a preposition; the high rate of omission in this context continues for quite a long time. This is ascribed to phonological reasons. In Italian, some prepositions form a single word with the following article (a so called ‘articulated preposition’); children might find this operation difficult and omit either the article, or the preposition, or both.

Although Belletti & Guasti offer a multi-sourced explanation for article omission in this second phase, the picture is not yet complete. As the authors point out, further investigation is needed in order to offer a complete explanation.

Gallina (2018), conducted a longitudinal study on three Italian children (Elisa, Marco and Gregorio from the Tonelli corpus in CHILDES²⁵). Additionally to Belletti & Guasti findings, she found that there are some further regular contexts in which adjectives are omitted. First, children omit articles in sentence-initial DPs, i.e., in DPs that have been fronted from their argumental position, as in (4).

- (4) a. castello fa Erri xxx Lololo [: Lorolo]. (Gregorio 2;00.10)
castle make Erri Greogorio
‘and then Erri makes a castle (for?) Gregorio’

²⁵ Elisa, Marco and Gregorio from the Tonelli corpus in the CHILDES database. They are three of the four children that I have analysed in my study; this will allow a direct comparison between the two analyses. See chapter 3 for details.

- b. (s)catola poi p(r)ende.
box then takes
'then he takes a/the box'

(Gregorio 2;00.10)

She then found that many of the nouns in front of which an article was omitted were either syntactically modified (by an adjective or a PP complement) or morphologically modified by a diminutive/evaluative suffix. She proposes that, consistently with Marinis' (and Eisenbeiss') results, at an early stage the noun only combines with one element at a time, be it a determiner, an adjective or a suffix.

The works reviewed so far make a clear prediction to the syntactic acquisition of early adnominal adjectives, namely that, at first, they will appear in alternation with determiners and will not co-occur. This, however, will be borne out only if the omission of articles in front of adjectives a) cannot be explained with other factors (e.g., prosodic factors as in Belletti & Guasti, left-peripheral position as in Gallina), and b) articles are omitted in front of *all* DPs modified by an adjective. If the omission of the article is optional also when an adjective modifies the noun, the claim that children only have one functional position available will be disconfirmed.

2.5 Acquisition of the syntax of adjectives

2.5.1 Crosslinguistic research

As already mentioned, the literature on the acquisition of the syntax of adjectives is not rich, as many studies focus rather on lexical and semantic issues. In this subsection, I will review some works which tackle different aspects involved in the syntactic development of adjectives.

A longitudinal study has been conducted by Blackwell (2000) on Adam's, Sarah's and Eve's corpus on CHILDES (MacWhinney, 2000), addressing how children acquire the syntactic position of adjectives. The age span is 2;3-5;2 for Sarah, 2;3-5;2 for Adam and 1;6-2;3 for Eve. Adjective utterances were extracted from the corpora through an adjective search list and coded for syntactic position and semantic class, using Dixon's classification.

Blackwell found that adjectives are used mainly in prenominal position (60-70%) and in predicative position (20-30%). These proportions hold across children and across age. Notice that *predicative* in this case identifies specifically adjectives in postcopular position. Other positions appeared later and were infrequent (e.g., other predicative functions of the adjective such as *I painted the table red*, *I*

consider him smart, etc.). Refining the analysis by semantic class, Blackwell found two patterns of development: a group of classes (Dimension, Colour, Age, Value and Speed) was produced first in prenominal and then in predicative position and were mainly prenominal, whereas a second group (Physical property and Human propensity) appeared first in predicative and then in prenominal position and were found mainly predicatively. Blackwell proposes that this distinction relies on “time stability”: the first group encodes “time-stable properties”, and that the second group encodes “unstable properties” (Blackwell, 2000, p. 372).

Lee, Scontras, & Pearl (2018) investigate another aspect related to adjectival syntax, namely adjective ordering restrictions (AORs) in English, trying to determine which factor is involved in their acquisition. Their study is based on Scontras, Degen, & Goodman (2017), who found a strong correlation between perceived subjectivity of an adjective and its relative distance from the noun. Scontras et al. asked explicit judgments on the subjectivity of adjectives and checked them against a) naturalness ratings for adjective orderings (participants were asked to decide in which order a two-adjective string sounded more natural) and b) a corpus analysis of multi-adjective strings. In a first experiment, they used 26 adjectives and they sorted them into 7 classes (age, colour, material, shape, value, dimension, physical). The multi-adjective strings were constrained by containing adjectives from two different classes, never from the same. They found that the more an adjective is rated as subjective, the further it was placed from the noun, thus confirming a strong correlation between the two measures. In a second experiment, they repeated the same tasks with a bigger set of 78 adjectives belonging to 13 classes (the previous one plus human, location, nationality, temporal, speed, and a class marked X collecting unclassified adjectives). They found that, at worst, subjectivity accounted for 51% of the naturalness ratings; if four superlatives are removed, it accounts for 61%, and if four outliers (*current*, *daily*, *solid* and *entrepreneurial*) are further removed it accounts for 70% of the variance observed. Scontras et al. conclude that subjectivity is the component of the meaning of the adjective that is relevant for predicting the mutual ordering of two adjectives; whatever its source, it is taken as an example of a language universal stemming from a cognitive universal, contrary to syntactic analyses to ordering preferences (such as the ones discussed in chapter 1).

Given this result, Lee et al. (2018) aimed at determining which factors are relevant in the acquisition of adjective orderings in English, and if and when learners converge on the adult endpoint, namely subjectivity. They compare the predictive power of three hypotheses: input frequency, lexical

semantic classes and subjectivity. If children exploit only input frequency, they should only know the relative ordering of two specific adjectives as found in the input, and not have any additional abstraction. This is the null hypothesis. If they have more abstract knowledge, they should be able to infer the relative ordering of two adjectives based on the semantic class they belong to, or on their subjectivity, as predicted by Scontras et al. (2017).

Lee et al. extracted adjective-adjective-noun strings from all the North America and United Kingdom corpora available on the CHILDES database (MacWhinney, 2000). They selected data in the age range between 2 and 4 years of age, and they extracted utterances from children's and adults' speech. They found 307 types used in multi-adjective strings by children. To calculate input frequency, they rated each adjective based on how frequently it appeared in a 1-away or a 2-away position from the noun in the caregiver's speech. To calculate semantic classes' predictory power, they rated the 307 adjectives based on Scontras et al.'s semantic classes and ordered them according to the results of the naturalness scores, yielding the hierarchy in (5).

- (5) Value > Dimension > Speed > Physical > Age > Human Location > Temporal > Color > Shape²⁶ > Material > Nationality > N

Finally, they measured subjectivity of the same adjectives through an experiment. They asked 108 native speaker of English how subjective an adjective was, following the procedure in Scontras et al. (2017). Once these parameters were obtained, the likelihood for each adjective to appear in the 2-away position was calculated for each hypothesis and compared with the actual output produced by children in the corpora.

The analysis yielded the following results. At age 2 and 3, the input frequency hypothesis outperforms the other two, but with a smaller margin at age 3. At age 4, instead, the lexical class hypothesis gives the best result. Thus, in this study, until age four, the best predictor of adjective ordering is input frequency and, after age four, the best predictor is semantic class. Therefore, it would be at this age that children acquire the abstract knowledge to classify adjectives into semantic classes. Since the adult endpoint is subjectivity, they conclude that this parameter and its use in AORs is acquired later.

²⁶ It is not clear why in their hierarchy colour precedes shape, whereas all the other sources that I have encountered assume the opposite.

An important point that emerges from this study is that semantic classes do appear to play a role in adjective orderings at a certain point in development. However, this study has some limitations. First of all, Lee et al.'s conclusion that the abstraction of semantic classes only emerge at age four is in contrast with Tribushinina et al.'s (2015) observation that children assign adjectives to a semantic class even prior to the full acquisition of their meaning. Rather, what Lee et al.'s result shows is that semantic classes are syntactically exploited by English-speaking children for AORs at this age.

A second, more general objection regards subjectivity. Although Scontras et al. found that subjectivity judgments on an adjective may predict its relative distance from the noun, this parameter does not seem to have enough explanatory power. For one thing, it does not explain the pre/postnominal patterns in Italian, nor the discontinuities found in the hierarchy. For another, in Scontras et al.'s experiments naturalness judgments were given only on pairs of adjectives belonging to different classes. So, in fact, these classes were included in and influenced the experimental design. Finally, although subjectivity (or a deeper cognitive principle from which it stems) might ultimately be the source of AORs as they are, this account does not provide a syntactic proposal of how these orderings are implemented.

Another study was conducted by Nicoladis & Rhemtulla (2006), who work in a usage-based paradigm. This approach to language acquisition proposes that children's early acquisition of syntax starts from single word combinations (e.g. cut paper, cut bread etc) which get progressively generalised to create frames (e.g. cut + N). From these first generalisations, through successive levels of abstraction, abstract structures are inferred by the child (e.g., VP + NP) (cfr. Tomasello, 2000 for an overview). Nicoladis & Rhemtulla taught children aged two, three and four novel adjectives in a weird word order paradigm, i.e., in a word order that is not typical of English. They presented novel adjectives either in prenominal position (A N order) or in a postnominal position (N A order). Additionally, they used a familiar adjective (*green*) as a control, presenting it always in the unfamiliar order N A. The adjective/noun combinations were presented several times in a context of free play; subsequently, the child's production was elicited through questions. The authors found that children hardly ever reversed the English order A N, but did more so with the non-English order: with novel adjectives they reversed N A combinations 28% of the times. This, however, means that they accepted and repeated the novel order 72% of the times with novel adjectives. Conversely,

they did not accept the order's reversal with the familiar adjective: 83% of the times, *green* was replaced in prenominal position²⁷.

The relevant result for the present discussion is that English-speaking children associate a specific position to familiar adjectives, in a way that suggests a lexically-based acquisition of adjective positioning (but does not exclude wider generalisations, such as a class-based positioning). This happens in a language in which adjectives are exclusively prenominal; it is to be expected that it would hold also for a language in which adjective position is variable.

Lee et al.'s (2018) and Nicoladis & Rhemtulla's (2006) studies provide some hints to the syntactic acquisition of the syntax of adjectives. The former alludes to an importance of semantic classes, at least at a certain stage in development, whereas the latter showed that the positioning of an adjective is tied to the familiarity of the adjective itself²⁸.

Blackwell's (2000) study provides useful data on English children's spontaneous production of adjectives, tracking the patterns of adjective positioning in general and across semantic class. These data may be used for a comparison with Italian ones.

Several questions, however, remain open. How is the acquisition of adjectives characterised in a language, like Italian, in which adjectives may be both pre- and postnominal? In addition, the divide between the two sources of adjectival modification are not considered. Do they have a relevance in acquisition? Is there a developmental path, as predicted by the data discussed in chapter 1? In the next section, I will discuss a study conducted on the acquisition of adjectives in Italian which takes into account these issues.

²⁷ These results are then compared with a similar study on S V O word order conducted by Akhtar (1999). Nicoladis & Rhemtulla's purpose is to define whether children's preference for SVO order is due to an abstract knowledge of the syntactic function of the parts involved, or simply to the intuition that English prefers noun-verb-noun orders. They target the production of adjectives because noun-adjective reversals do not radically change the meaning, contrary to inversion of verb arguments. This aspect of the study is not relevant for discussion here.

²⁸ In my view, this does not imply that adjective positioning relies exclusively on lexical specification; if in a language the position is tied to a semantic class rather than to single lexical items, this effect may be given by the knowledge that the item belongs to the relevant class, whereas novel adjectives may be mapped in either way.

2.5.2 The acquisition of adjectival ordering in Italian (Cardinaletti & Giusti, 2010)

One study has been conducted by Cardinaletti & Giusti (2010) (henceforth C&G) on the syntax of adjectives based on a Cinquian approach. This study provides the baseline for the analysis that has been conducted here. In their article, Cardinaletti & Giusti aim at determining whether children acquiring Italian are sensitive to the word order complexity displayed by nominal modification in the target language.

The authors start with an analysis of the Italian DP and the various modifiers of the noun, namely possessives, quantifiers and quantity adjectives, determiner-like adjectives (ordinal numerals and *altro*) and descriptive adjectives, taking the direct/indirect modification divide into account. They observe that these elements display subtle variations in word order, which combine the fixed position of some elements (e.g. *altro*) and the optional movement of others; such movement is usually associated with minimal semantic and pragmatic variations. As mentioned in section 1.3.4, C&G take only value adjectives to be truly prenominal in colloquial speech; they maintain that prenominal size adjectives have an evaluative interpretation.

The question they address is whether children are sensitive to this variation, and whether they can reproduce it in their own speech; in their own words: “Do Italian children acquire all possible orders at the same time? And do they use them appropriately in the discourse?” (Cardinaletti & Giusti, 2010, p. 68). They work under the assumption that, if children show adult-like behaviour, this can be attributed to adult-like inherent representations and no further explanation needs looking for.

To answer the above question, they conducted a longitudinal study on four children, Gaia (aged 1;6-2;6), Sara (1;9-2;4), Ernesto (1;8-3;0) and Gregorio (1;7-2;0). The four children produce adjectives from the first recordings; at first, often in isolation. These might be predicates with a missing copula or modifiers with a missing noun; in any case, they show number and gender agreement with the intended referent. This is taken to mean that the adjective is not produced as the pure lexical item, but that some structure is already built above it. This result contrast with Noccetti’s (2015), whose children produce inflected adjectives after age 2;00.

They further found that *altro* is present from the outset, combined both with the definite and the indefinite article. This shows that the whole nominal structure is already available for the child and diversified, because both the determiner and the prenominal adjective need to be accommodated

in it. As for descriptive DM adjectives, they found that children produce only some classes of adjectives inside the nominal expression. Of Cinque's hierarchy (Value > Size > Shape > Colour > Nationality > Classificatory), only Value, Size and Colour are present in adnominal position, whereas shape, nationality and classificatory adjectives are not; this is ascribed to a lack of the relevant encyclopaedic knowledge.

DM adjectives are found almost always in postnominal position. Only two lexical items are found in prenominal position, *bello* 'beautiful' (5 tokens, 3 Sara and 2 Gregorio) and *grande* 'big' (1 token, Ernesto). C&G contend that *grande* is prenominal in a unique occurrence, and that it is used evaluatively; thus, children's use minutely reflects the adult colloquial style in allowing only value adjectives to be prenominal.

Subsequently, C&G analyse the production of IM adjectives. They state that "while certain classes of adjectives can be direct or indirect modification, others can only be of one kind. In particular, stage-level adjectives can only be indirect modification, and for this reason, they can only appear in postnominal position". In this perspective, all adjectives like *vuoto* 'empty' and *sporco* 'dirty' are coded as stage-level and considered to be inherently IM adjectives. C&G find that these adjectives 1) are never produced prenominally, and 2) they are produced slightly later than individual-level adjectives. This result is compared with Blackwell's (2000) finding that "adjectives that denote 'unstable properties' (e.g., dirty, clean, wet, dry, hot, cold; happy, sad, sick) appear in prenominal position later than adjectives denoting 'more stable properties' (e.g., round, straight, pretty)" (Cardinaletti & Giusti, 2010, p. 91). C&G relate Blackwell's finding to the DM/IM divide, stating that 'unstable properties' correspond to stage-level adjectives and that 'stable properties' correspond to direct modification ones.

This study goes a long way towards answering the research questions that we have posed. Some issues, however, remain open. First, the semantic classification adopted does not seem to be adequate. Among DM adjectives, those that do not enter Cinque's hierarchy are categorised as 'other' (e.g., *nuovo* 'new' and *morbido* 'soft'). Since these adjectives occur in postnominal position, an analysis of direct modification would benefit from a more precise classification.

Further, the adoption of 'stage-level' as an adjective category might obscure some of the data. This choice is not without reason: the underlying assumption is that, if adjectives like *sporco* 'dirty' and *bagnato* 'wet' have a stage-level interpretation, they are not associated with a DM position in the nominal extended projection; therefore, they do not need to be classified in a semantic class.

Although it is true that these adjectives are typically stage-level and denote transitory properties, whereas other categories such as colour and shape denote stable properties, both are context-dependent in their interpretation. A colour adjective might be used restrictively, hence as IM, while 'dirty' could be used in an absolute sense as DM. Because all these adjectives are always postnominal, we have at present no syntactic test to determine which may or may not be used for direct modification (whereas the possibility for indirect modification is easily tested through the possibility of occurring predicatively).

A further gap in C&G's study is the interaction between adnominal and predicative use of adjectives. It is not clear from their results when adjectives start being produced with an overt copula and when they unambiguously appear in adnominal position. Does the predicative use precede, follow or parallel the attributive one? This question is important also for testing whether adjectives appear in multiple syntactic frames from the outset. Furthermore, one of the implicational scales that are predicted by Cinque's syntactic system states that the availability of IM is subject to the availability of the predicative position:

- (6) Predicative < IM.

2.6 Adjectives and theories of acquisition

In chapter 1, I have adopted a cartographic approach to syntax. I will briefly describe its main features (Cinque & Rizzi, 2010; Cinque, 2002; Rizzi, 2004b) and I will consider what predictions it makes for acquisition.

Cartography, in its broad sense, is a descriptive endeavour, which aims at drawing precise maps of syntactic configurations in a comparative cross-linguistic perspective, by detecting the structural correspondences beyond surface differences. In the practice, however, much cartographic work has rested on stronger assumptions. Noticing that more and more research brought to a finer splitting of functional heads, the theoretical assumption that underlies current lines of research is that each morphosyntactic feature heads a single projection in the functional hierarchy, in a 1:1 correspondence. In other words, there are not complex heads, composed of many features, at least not primarily: the only way to derive them is through "movement" (or multiple occurrence) of the same element in different positions (Cinque & Rizzi, 2010, par. 5).

The stronger position with regards to the featural hierarchy is that “the hierarchies of functional projections dominating VP, NP, AP, PP, IP etc. may be universal in the type of heads and specifiers that they involve, in the number and in their relative order” (Cinque & Rizzi, 2010, p. 4), whereas a weaker position would be to posit that languages may differ in the inventory and/or the order of features. Cinque & Rizzi (2010) underline the fact that cartography is not in contrast with the principles of minimalism. They state that, while minimalism studies the mechanisms involved in syntactic computations, i.e., on the ‘generating devices’, cartography focuses on the details of the generated structures. This is possible if extremely simplified recursive operations (internal and external Merge) are combined with a rich set of features, such that the recursive application of these simple operations as applied to the features yields complex syntactic objects.

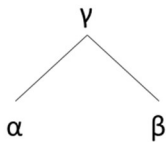
The question is how this relates to the acquisition of syntax. How are the features made available to the child? Are they available from the outset of acquisition? Can they be automatically mapped onto a projection, or are single features mapped earlier or later onto syntax? Are the structures already built and available from the outset or must the child build it through the interaction with the input? Are they subject to maturation, or are early productions deviant from adult ones based on other factors?

As can be noticed, these questions restate in fact the various alternative approaches that have been discussed in the history of generative approaches to language acquisition (maturation, strong continuity, weak continuity, etc. See Marinis (2003, Chapter 1) for an overview). Many of them are hard to be answered, and this is certainly not the aim of this work. Here, I will consider some possibilities with respect to the prediction that they can make for the acquisition of the syntax of adjectives.

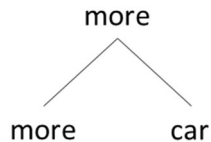
Marinis (2003) offers an overview of the predictions made by some theories within the generative approach (principles and parameters, minimalism). I will make reference to some points of his discussion here.

A first possibility is offered by core minimalist approaches. If the fundamental operation of syntax is Merge, which combines two syntactic objects to create a new one, we could think that infants start by simple single operations of merging two words without further specification. Two words are merged, and one labels the new syntactic object.

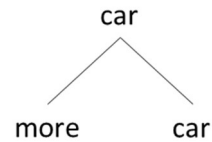
(7) a.



b²⁹.



c.



(Marinis, 2003, p. 28)

Subsequently, through interaction with the input, the child discovers which features need to be projected and start doing so, although not in a way consistent with the adult grammar. Ongoing exploration of the input will finally provide enough evidence for projecting the relevant features on functional projections.

This hypothesis predicts that children pass through a stage in which they always associate only two words (as the two-word stage seems to show); more specifically, there should be a stage in which adjectives and articles occur in complementary distribution with nouns. I will call this the Structure Building hypothesis.

This approach, however, if disconnected from a cartographic perspective, is hardly compatible with the fine-grained syntactic structures that cartographic research has proven to exist. Let us take a partial inventory of nominal modifiers in Italian: possessive adjectives, demonstratives, ordinal and cardinal numerals, relative clauses, DM adjectives, IM adjectives, pre-cardinal adjectives, quantifiers, etc. Moreover, these modifiers interact with features such as gender, number, countability... A large amount of research has proven that the functional inventory of the DP is quite rich. How could a child build such a structure from scratch? What cues could s/he exploit to determine the functional sequence? One way would be to compare the relative distance from the noun of the various modifiers. But how many instances of each combination should s/he be exposed to in order to discover the relative position of each modifier? As remarked by Cardinaletti e Giusti (2010), nominal modifiers are optional by definition, and are not as frequent in the input as nouns or verbs. Besides, multiple occurrences in the same DP would be necessary to discover the relevant position, and in all the relevant combinations. A further source of difficulty is given by the variability of these modifiers. As already discussed, some adjectives may be either prenominal or postnominal; some others may be used evaluatively although their core semantic trait is *dimension* or *physical*

²⁹ Although this is a logical possibility, it is unlikely that the child maps this two-word combination in this way, as the findings of the prosodic bootstrapping hypothesis leads to believe (cfr. Guasti, 2001, par. 3.4 and references cited there)

property. Italian possessives are generated low and subsequently raised, and may have different positions due to pragmatic factors. However, multiple modifiers are not that frequent in the input, and multiple occurrence of descriptive adjectives are rare. How could a child make sense of all this complexity and variability? (cfr. Cardinaletti & Giusti, 2010)

The issue takes a different perspective if we assume that the order of features is somehow already given. In this case, once the child detects a feature from the input, s/he would not be burdened by the need of finding its right place in the hierarchy. If some universal factor (whether intra-linguistic or of other nature) provides the sequence $A > B > C > D$, once the child finds out that her language encodes features A and D she will not have to discover that $A > D$. Instead, this sequence is already given. In this perspective, although the inventory of features is universally given, the single language does not necessarily arrive to employ them all. For instance, a language that distinguishes between *length* and *height* adjectives will have a specific projection for each of them, whereas another language only has a generic *size* projection. The child who is presented with a hypothetical proof that her language syntactically distinguishes the two categories will build a more fine-grained structure to accommodate the relevant information; the relative order of the two projections is already given in the universal set of possible features.

In this case, the prediction will be that the acquisition of the direct modification functional hierarchy in the DP might be initially restricted to only some projections, until the child has learnt which ones are projected in her target language. I will call this the Revised Structure Building hypothesis.

The opposite case would be that the universal feature hierarchy is already completely projected in a syntactic structure, and that the whole extended projection is already available to the child from the outset. In this case, the whole set of universal features will always be projected, and the unavailability of certain projections might be due to other factors, such as maturation.

A classical maturational account of the development of grammar is Rizzi's (1993) truncation hypothesis, proposed to account for the phenomenon of root infinitives in the clausal domain. Rizzi proposes the Axiom on clausal representation: 'CP is the root of all clauses'; in other words, all sentences are CP maximal projections. In Rizzi's proposal, the structure is already built, but at an early stage the Axiom is not available to the child. Therefore, not all structures will be CPs, but some will be truncated. When a structure is truncated at the level of a lower projection, say TP, this becomes the root of the clause and all the projections above it are inactive. At a certain point, the Axiom on clausal representation will mature and the option of truncation will disappear.

Importantly, what matures are not single projections; the child may truncate structures at different points, such that truncated and non-truncated structures may co-occur at the same stage.

If this also applies to the acquisition of adjectival modification, we should find non-target productions that can be explained with the truncation of a portion of structure above a certain point. This would imply also the unavailability of the DP layer in the non-target productions, as adjectives are merged lower than DP (and NumP), in a way very similar to what happens at the sentence level. However, all the projections below the truncation point should be equally available and activated, including all the adjectival modification FPs. I call this the Full structure hypothesis.

We have considered two opposite possibilities, the first being that the language specific hierarchy is built through a successive discovery of the features employed by the target language, and the second that the hierarchy is already available from the outset and is always projected; non-target productions are due to other factors such as maturation.

An intermediate possibility exists. In chapter 1, section 1.3.3, we have seen how the fine-grained system of semantically related projections might be characterised as “fields” (e.g., the Topic field and the Focus field in Benincà & Poletto (2004)). The possible developmental side of this could be that at the outset only one core semantic position for the whole field is projected, and only subsequently split in its single features. How this is achieved is yet another question – one possibility is, in Rizzi’s terms, that this projection is a sort of complex head formed by aggregated features; in a strong cartographic perspective this is only achievable through head movement (Cinque & Rizzi, 2010, par. 5; Rizzi, 2004b, p. 8).

Thus, the prediction will be that at first only some classes of adjectives will be projected; in this case, they should be identifiable in some sense as ‘core’ classes. I will call this the Splitting hypothesis.

In order to apply this discussion to the study of spontaneous production, predictions emerge for two separate parameters. The first relates to the availability of the DP when the child starts producing adnominal adjectives, returning to the issue discussed above. The Structure building hypothesis predicts that the child pass through a stage in which determiner and adjective are in complementary distribution, i.e., all determiners are omitted when a noun is modified by an adjective. On the contrary, the Full Structure hypothesis predicts that there is not a stage with a complete alternation between articles and adjectives. There might be instead optional determiner omission, due to truncation or other independent reasons (see Belletti & Guasti, 2015 above).

The second parameter to be considered is the specification of the direct modification hierarchy. The Full structure hypothesis predicts that all projections are activated from the outset; it should not be the case that only some projections are available in the tree. Instead, the Splitting hypothesis and the Revised full structure hypothesis predict that there may be a phase in which only some 'core' (in some sense) projections are exploited; thus, only some classes are used for adnominal modification. These classes should be characterised by either some prominence in the input (e.g., frequency), or some core quality of the field they represent.

2.7 Predictions and research questions

In this section, I will recapitulate the predictions emerged in chapters 1 and 2 relating to my research questions and I will formulate some more specific questions to guide the analysis.

1. HOW DO CHILDREN ACQUIRE THE SEMANTICS OF ADJECTIVES?

Relating to the studies on the semantic acquisition of adjectives (Nocetti, 2015; Tribushinina et al., 2015), the prediction is that semantic classes contribute to the acquisition of adjectives; furthermore, early adjectives are grouped into classes before their meaning is fully acquired. The following question will be addressed: Does adjective acquisition proceed in an item-based fashion, or does it rely on semantic-conceptual classes?

As concerns the acquisition of semantic classes, Tribushinina et al. (2014) found that the first classes to be acquired cross-linguistically are those that denote concrete concepts, which are readily available to the child. What classes are acquired first by Italian children? Do they confirm Tribushinina et al.'s interpretation?

2. HOW DO CHILDREN ACQUIRE THE SYNTAX OF ADJECTIVES?

Adjectives in Italian may be used both for predication and for nominal modification. Blackwell (2000) found that predicative adjectives are 20-30% and adnominal ones 60-70% of English-speaking children's productions. Descriptively, adnominal adjectives in Italian may be prenominal, postnominal or pronominal. Cardinaletti & Giusti (2010) found that children are target-like in their placement of adjectives. The following questions will be addressed: In which syntactic position do early adjectives appear? What is the developmental sequence? Are productions target-like?

As concerns the relation of the adjective with the syntax of the DP, it has been shown that early adjectives in German are in complementary distribution with determiners (Eisenbeiss, 2000), and

that early determiners are impostors; a finding confirmed by the acquisition of the DP in Modern Greek (Marinis, 2003). Conversely, studies on Italian propose that early articles are expressions of the D head and omission is accountable for, through phonological facts or other factors. Longobardi (1994), for instance, pointed out the influence of type of noun and syntactic position in the lexicalisation of the determiner.

The Structure building hypothesis predicts that multiple functional layers are not available at the outset in child's grammar, but that the noun should only combine with one element. Conversely, the Full structure hypothesis predicts that early article omission should be optional.

Do early adjectives appear in complementary distribution with determiners? Is there an interaction with syntactic position and type of noun? Is there evidence that the DP is already available when adjectives are used as adnominal modifiers?

3. HOW DO CHILDREN ACQUIRE THE ALLEGED SYNTAX-SEMANTICS MAPPING?

Cinque (2010) describes two sources for adjectival modification, direct and indirect modification. The first employs adjectives as non-restrictive, individual-level, absolute modifiers by merging them in the specifier of dedicated functional projections; in the second, adjectives are merged as predicates of a reduced relative clause and employed as restrictive, stage-level modifiers. Two implicational scales have emerged for the acquisition of indirect modification (cfr. par. 1.7):

- (8) a. Pred < IM
- b. DM < IM

Is there any evidence of children's acquisition of the two types of adjectives, DM and IM? Are the implicational scales respected?

As regards direct modification, it is proposed that it interacts with semantic classes. Lee et al. propose that the relevance of semantic classes for adnominal modification is active around 4 years of age; if valid also for Italian and for the purposes of this study, semantic classes should not have a syntactic relevance in the earliest productions. If, on the contrary, the multiple layers of the direct modification hierarchy are relevant at an early stage, semantic classes should show to play a role. The Full Structure hypothesis predicts that all projections are available at the outset, whereas the Revised structure building and the Splitting hypotheses predict that there may be a stage at which only some salient/core classes are projected in the DP. Thus, the following questions will be

addressed: How is DM acquired? Is there a relevance of semantic classes for adnominal modification? Which hypothesis best describes the data?

In the next chapter, a longitudinal spontaneous production study will be presented in order to address these questions.

Chapter 3. Method and results

3.1 A corpus study of children's spontaneous production

In the previous chapters, I have outlined some research question: 1) How do children acquire the semantics of adjectives?; 2) How do children acquire the syntax of adjectives?; 3) How do children acquire the alleged syntax-semantics mapping?. To address these question, I conducted a longitudinal study of the spontaneous production of four Italian monolingual children aged between 1;5 and 2;11, based on two corpora already present in the CHILDES database (MacWhinney, 2000). The Italian corpora can be found following the directory Browsable database/Romance/Italian/Tonelli and database/Romance/Calambrone.

A spontaneous production study provides insightful data on the child's acquisition through a relevant stage in her development of linguistic production, thus enabling us to observe how the production of a linguistic phenomenon develops over time. This methodology adds to experimentally elicited data because it gives a picture not only of what the child *can* produce, but also of what s/he *will* produce, taking into account also processing difficulties and preference for certain structures.

On the other hand, as well known, spontaneous production does not tell us everything on the child's competence, for two reasons. Firstly, it cannot cover the totality of the child's production, but will be limited to a short recording on a regular basis in the best of cases. Secondly, children do not produce at the best of their linguistic competence, but they avoid instead those factors of complexities that, although correctly understood and processed in experimental studies, can be avoided by means of an alternative strategy due to economy reasons.

Thus, a longitudinal study does not provide direct access to the child's knowledge of language, but rather to the specific production patterns that see the active use of one or the other form of adjective-related syntax. From these, some abstractions may be attempted.

3.2 The corpus

The study was conducted on four children. The three children in the Tonelli corpus (Tonelli, De Marco, Vollmann, & Dressler, 1998), Elisa, Gregorio and Marco, were selected, as well as one child, Raffaello, from the Calambrone corpus (Cipriani et al., 1989).

Adjectives were singled out through an exhaustive reading of each file; no search tool was used. Part of the reason was that the morphological tier %mor, although present in the Tonelli corpus (but not in the Calambrone corpus), was not a manual analysis but an automatic one, and the level of accuracy was not judged to be adequate. Only the transcriptions are available for these children, not the original audio or video recording. For this reason, a prosodic disambiguation of problematic cases (or any other than conversational context) was not possible.

As can be seen in Figure 3.1, the amount and distribution of recordings among children is rather diverse. Elisa is recorded from age 1;10.04³⁰ to age 2;01.23, a period of four months, for a total of 8 files, which are not regularly distributed: the last three files were recorded within four days. Gregorio's data are equally not abundant, but he is followed for a longer period, from age 1;07.17 to age 2;00.29. Marco, instead, was recorded from age 1;05.04 to age 2;05.24, which covers a whole year of his life. His transcriptions are regularly bimonthly, and all report a 45 minutes conversation between Marco and his mother. The amount of data available for Marco is significantly superior to all other children. Finally, Raffaello's transcriptions span from age 1;07.07 to age 2;11.20, the longest period covered, although the frequency and length of recording are lower than those of Marco (approximately once a month, apart from the last month, whose recordings are three; not all months are covered).

Child	Corpus	Age of fist recording	Age of last recording	Number of files
Elisa	Tonelli	1;10.04	2;01.23	8 files
Gregorio	Tonelli	1;07.17	2;00.29	8 files
Marco	Tonelli	1;05.04	2;05.24	27 files
Raffaello	Calambrone	1;07.07	2;11.20	17 files

Table 3.1 Children included in the study

³⁰ This formulation designates a 1 year, 10 months and 4 days old child.

3.3 Data coding

This study focuses on the acquisition of attributive adjectives only; possessives, numerals (both cardinal and ordinal), other quantifiers and demonstratives were not taken into account.

All the utterances containing at least one adjective have been copied and coded in a spreadsheet.

Each line of the spreadsheet consisted of the following clusters of fields:

- Identification of the utterance
- Lexical and semantic classification of the adjective
- Syntactic position of the adjective
- Noun and determiner

When an utterance contained more than one adjective, the following criteria were followed:

- When the utterance contained two or more different adjectives, it was coded twice, once for each adjective, regardless of the relation between the adjectives (coordination, modification of the same DP, no syntactic relation between the two);
- Whenever the same adjective was repeated in the same utterance and in the same structure, it was considered as one single occurrence;
- When the same adjective was repeated in two different syntactic structures, or the same structure but with different lexical material (e.g., modifying a different noun) it was counted twice.

Some examples of the criteria used to count the occurrences are shown in (1). In (1)d, for instance, 'black' occurs twice, once in coordination with 'red' and once together with the noun 'cat'; therefore, the utterance has been repeated three times, once for 'red' and twice for 'black'.

(1) a.	cione [/] cione [/] (aran)cione . orange / orange / orange	Coded once	(Marco 1;06.22)
b.	rossa , nera . red, black	Coded twice	(Marco 1;09.01)
c.	un altro bello soldatino [: soldatini] . an other pretty soldier.little 'another pretty toy soldier'	Coded twice	(Gregorio 2;00.10)
d.	rosso e nero gatto nero . red and black cat black 'red and black, black cat'	Coded three times	(Marco 1;10.12)

All coding criteria are reported in detail in the next sections.

3.3.1 Item identification

Each utterance was uniquely identified through the following fields:

1. ID: name of the child;
2. AGE: in years;months, e.g., 1;10;
3. FILE_SOURCE: directory of the file in CHILDES;
4. FILE_SOURCE_LINE: line of the transcription in which the utterance occurred;
5. OUTPUT: the whole utterance was copied.

This information was repeated when the line was doubled due to a multiple adjective occurrence.

3.3.2 Adjectives and semantic classes

Each adjective was then singled out and coded for the following information:

6. ADJECTIVE (TOKEN): the adjective was reported in the morphological form it appeared within the utterance, with phonological adaptation when necessary. The phonological form, when deviant from that of adults, was adapted to the adult one; original gender and number marking and evaluative suffixes were reported as such.
7. ADJECTIVE (TYPE): the lexical item the adjective belonged to was reported, in its masculine singular form, without suffixes.
8. TYPE ADJECTIVE, ADJECTIVE CLASS, MACRO: these fields coded the semantic-notional class the adjective belongs to, such as *colour* or *size*. The first field coded a specific subclass (e.g., *length*, *edibility*...), the second an overarching semantic class (e.g., *dimension* for *size*, *length*, *height*...) and the third a macro-group of semantic classes. The inventory of semantic classes was a matter of careful consideration, and is discussed in detail below;
9. PART OF SPEECH: the adjective was identified based on morpho-lexical criteria as an adjective (ADJ) or as the past or present participle of a verb (PART)³¹.

³¹ An adjective like *bagnato* 'wet' occurs quite early in children's speech (cfr. Blackwell, 2005 for English). In Italian, its form is identical with the past participle of the verb *bagnare/bagnarsi* (to wet/get wet). It is possible, in principle, that this form is acquired first as an adjective, if presented in the input always in the relevant context, and only later related to the corresponding verb. A similar observation might be made for *acqua bollente* (boiling water), whose present participle might have been learned in this collocation, and not as a form of the verb *bollire* (to boil). Since for the type of study here carried out it would be impossible to disentangle whether this is the case, all forms which are morphologically identical to the past or present participle of an existing Italian verb have been coded as *PART*.

Semantic-notional classes (TYPE ADJECTIVE field)

As seen in sections 1.3.2, 1.3.3 (Chapter 1) and 2.3 (Chapter 2), the classification of adjectives is a problematic issue. On the one hand, the theoretical literature on the syntax of adjectives has not yet provided a comprehensive inventory of all adjective ordering restrictions. The most detailed attempt in this sense is Scott's (2002), who leaves nevertheless many important classes out of his analysis. A further issue that has not been exhaustively answered is whether these extremely fine-grained distinctions, that involve micro-categories such as *length*, *depth* and *weight* are to be intended each to be hosted in a separate projection, as argued against by Svenonius (2008).

Conversely, acquisition works (Blackwell, 2005; Tribushinina et al., 2014) provide a detailed and comprehensive classification, which is however incompatible with the syntactic hierarchies of the projections where adjectives are merged. In my view, at least a general hierarchy should be considered if we want to maintain the intuitions of syntactic theory and apply them to the study of language acquisition. Furthermore, acquisition itself might shed new lights on and help interpret some aspects of these theories.

The crucial point is that the classification of adjectives is not to be taken as a purely lexical fact, because it is reflected in syntax, as extensively discussed in chapter 1. Adjectives with different semantic features will merge at different points of the syntactic structure, bringing different interpretive properties in virtue of this. To answer the question of how children deal with this semantic-lexical-syntactic variation, we must first provide a coherent classification.

My aim was thus twofold: first, I intended to find at least macroscopic groups of adjectives that can be ordered with respect to one another and other elements in the DP. Second, I wanted to provide a fine-grained comprehensive classification that could include all the adjectives produced by the children, as other acquisition works do. It was outside the scope of this thesis to investigate whether all these micro-categories do have a syntactic counterpart and to define their relative ordering; therefore, no assumption will be made towards their precise position in the nominal projection.

The classification adopted has a substantial advantage: it allowed us to classify all the adjectives encountered; Table A.1 in the Appendix shows their detailed classification. Five macro groups have been identified: *pre-cardinal*, *modal*, *descriptive*, *classificatory* and *stage-level*. The only adjectives in the Other category are novel adjectives (*nonce*) created by the children.

First, the two pre-cardinal adjectives *altro* and *solo* have been grouped together (*pre-cardinal*) (Cinque, 2012).

Second, a *modal* group has been identified. This group contains both the properly modal adjectives, as commonly intended in the literature (epistemic, evidential...) and evaluative adjectives. This choice was driven by the observation that these adjective classes share the property of involving the speaker's evaluation or commitment with respect to the property assigned to the object (cfr. Scott, 2002; Demonte, 2008; Ramchand, 2018).

This contrasts with *descriptive* adjectives, which do not involve the speaker's evaluation or commitment. The group of *descriptive* adjectives collects the following classes: dimension (which includes core size adjectives, length, height, etc., speed and other subcategories), physical property (many subcategories are the same as Tribushinina et al.'s (2014), but not all are included), human propensity (Tribushinina et al.'s internal state, physical state and behavioural adjectives), age, shape and colour. Their relative order is the one indicated by the literature: DIMENSION > AGE > SHAPE > COLOUR; I integrate physical property and human propensity on the basis of Lee, Scontras, & Pearl's (2018) hierarchy, which has the advantage of being based on experimental work:

- (2) Value > Dimension > Speed > Physical > Age > Human Location > Temporal > Color > Shape³² > Material > Nationality > N.

Therefore, the hierarchical organization of descriptive adjectives adopted here is the following:

- (3) DESCRIPTIVE ADJECTIVES: Dimension > Human propensity > Age > Physical property > Shape > Colour.

The fourth group has been named *classificatory* adjectives. It includes properly classificatory adjectives such as *nervous* in *nervous system*, idiomatically combined adjectives such as *wild* in *wild rice* (Svenonius, 2008) and relational adjectives, a sub-class of classificatory adjectives that relate two nominal concepts (Alexiadou et al., 2007). These adjectives are closest to the noun.

A last group is that of *stage-level* adjectives. These adjectives could not be classified in any of the previous classes, and were contextually clearly used as indirect modifiers, as stage-level adjectives or with a *result* interpretation. This refers to past participles used adjectivally, designating the resulting state of the event described by the verb from which they derive.

³² It is not clear why in their hierarchy colour precedes shape, whereas all the other sources that I have encountered assume the opposite.

3.3.3 Syntactic position of the adjective

The next step was the identification of which syntactic structure the adjective occurred into. This was achieved through the combination of two parameters:

10. PRESENCE OF THE NOUN: two possible values were assigned. *Present* was used when the adjective adnominally modified an overt noun, so that a prenominal or a postnominal position could be distinguished; *absent* was used in all other cases.

11. POSITION: this parameter coded in detail the syntactic position of the adjective. Possible values were *O*, when the adjective was used in isolation; *pred* when it appeared in predicative position (postcopular position and other cases which will be discussed in the results); *exclamative* for those that occurred in constructions like a main exclamative CP, or in general in a clear exclamative position; *prenominal* and *postnominal* for the position of an adnominal adjective modifying an overt noun; *pronominal* for adjectives that occurred within a DP but with a non-lexicalised noun; *ambiguous* for those situations in which more than one representation was possible; and *unclear* for cases in which the transcription was partially missing or the utterance was difficult to understand. Examples are in (4).

(4)	a.	rossa . 'red'	Isolation	(Marco 1;06.22)
	b.	sei brutto tu . are ugly you 'you are ugly'	Predicative	(Marco 1;11.16)
	c.	che buffo . what funny 'how funny'	Exclamative	(Marco 2;02.11)
	d.	ma mi dai quel <u>piattino</u> viola ? but to-me.CL give that plate-DIM purple 'will you give me that purple saucer?'	Postnominal	(Elisa 2;01.20)
	e.	è un bel (.) <u>ponte</u> . is a nice bridge 'it is a nice bridge'	Prenominal	(Elisa 1;10.04)
	f.	c'è un altro (.) un altro bello . there is an other . an other pretty 'there is another pretty one'	Pronominal	(Gregorio 2;00.10)
	g.	dov'è xxx bello . where is beautiful	Unclear	(Gregorio 2;00.10)

In the course of the analysis, the positions have been grouped in the following way: Isolation (0), Adnominal (*prenominal, postnominal, pronominal*); Predicative (*pred, exclamative*); Unclear+Ambiguous.

A clarification is needed for the identification of the adnominal position. At a stage in which the child completely or partially omits functional morphology, it is often difficult to establish whether an utterance consisting only of a noun and an adjective is to be considered a DP without the determiner, or a predicative structure without the copula. (5)a, for example, is compatible both with the reading in (5)b, where the omitted element is the determiner (either a definite or a partitive or a null one), and the one in (5)c, where the copula is missing instead. Note that the presence of the determiner is not disambiguating *per se* when the adjective is postnominal. In (6)a, we do see the definite determiner, but in principle there still could be a missing copula. However, if we consider the context (6)b, we see that this utterance is an answer to a question requiring the identification of a referent. The whole conversation is coherent, and the only consistent reading is the one proposed. Therefore, it should be appropriate to consider (6)a as a DP.

- (5) a. cappe [: scarpe] bute [: brutte] . (Gregorio 1;07.17)
 shoes ugly
 b. = le/delle/O scarpe brutte
 'the/O ugly shoes'
 c. = le scarpe sono brutte
 'the shoes are ugly'
- (6) a. l' orso pazzo . (Raffaello 2;05.13)
 the bear mad
 b. MOT: ... chi è arrivato che si è poppato tutto il latte dal secchio ?
 'Who arrived and drank all the milk in the bucket?'
 CHI: l' orso pazzo .
 'the mad bear'

This considered, every time the item displayed such an ambiguity a contextual disambiguation was attempted. If the context could provide a clear proof of the correct interpretation, as in (6)a for instance, it was coded as predicative or adnominal. When the interpretation was probable but not certain, the coding *ambiguous* was used. I have been conservative in this, preferring to maintain an ambiguous reading rather than proposing unjustifiable analyses.

3.3.4 Noun and determiner

A further cluster of fields was dedicated to the coding of nouns and determiners. Only when the adjective was in a DP, i.e., in all instances of adnominally used adjectives (prenominal, postnominal, pronominal), the noun (when present) and the determiner were identified and tagged. The following tags were used:

12. NOUN (TOKEN): the noun was reported as it was produced by the child, with the same number and gender marking and evaluative suffixes; as in the case of adjectives, child-like phonology was adapted to the adult one.
13. NOUN (TYPE): the lexical item of the noun was reported, in the singular form (and masculine when relevant³³).
14. TYPE NOUN: in this field, nouns were classified according to their semantic and morphological properties, following Longobardi (1994): *NCS*: count singular nouns; *NCP*: count plural nouns; *NM*: mass nouns; *NP*: proper names
15. DET (TOKEN): the determiner (and other determiner-like elements when clearly substituting an article) were reported as tokens, following the same criteria as for adjectives and nouns;
16. TYPE DET: determiners were tagged as *def* (definite³⁴), *indef* (indefinite³⁵) or *num* (numeral³⁶).

In general, when the transcription was unclear or partially missing, the field was tagged as *unclear*; when instead two possible interpretations of the same structure were possible, it was coded as *ambiguous*.

³³ Although grammatical gender is usually lexically specified on the noun, it seems that some [+animate] nouns are underspecified for this feature and show morphological masculine/feminine alternation. The question whether they are two separate lexical items or a single one does not affect analysis here in any way, so I will not discuss it any further. I refer to (Alexiadou et al., 2007, pt. 2, par. 3.3) for comprehensive discussion.

³⁴ Definite articles and demonstratives.

³⁵ Indefinite articles, partitive articles, indefinite quantifiers like *tanti* (many).

³⁶ Numerals in Italian can either occur with or substitute a determiner. Only cases like the one in (i), in which the numeral is used as a determiner, were counted.

(i) due pezzetti picchinini [: piccolini] .
two pieces small 'two small pieces'

Marco (2;00.00)

3.3.5 Additional coding

At a subsequent stage, I have extracted all adjectives present in a DP and further coded them separately. The additional coding aimed at determining the syntactic position of the DP the adjective belonged to. Three fields have been added:

17. DP position: this field coded the syntactic environment the DP appeared into (see Table 3.2).
18. Syntactic ROLE: this field was tagged for the syntactic role of the DP in the clause. A summary of the possible values for these two fields is given in Table 3.2.
19. DET_Target: the value was *yes* for DPs that were target-like with that determiner in their position, and *no* for DPs that were not target-like.

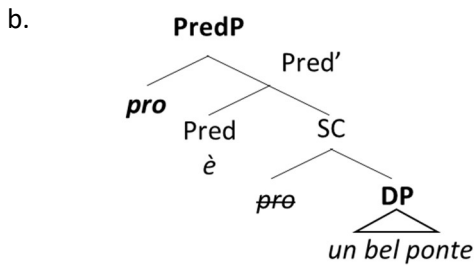
DP position		Syntactic ROLE	
<i>arg</i>	the DP is the argument of a verb	<i>obj</i>	object
		<i>subj</i>	subject
		<i>PVsubj</i>	postverbal subject
		<i>adv</i>	adverbial
<i>pred</i>	the DP is in predicative position	<i>subj</i>	(syntactic) subject
		<i>comp</i>	complement
		<i>excl</i>	exclamative position
<i>prep</i>	the DP is preceded by a preposition		
<i>ambiguous</i>	the utterance is compatible with more than one structure		
<i>0</i>	the DP is not in a recognisable syntactic frame, i.e., in isolation or surrounded by irrelevant material		

Table 3.2 Possible values for the fields “DP position” and “ROLE”

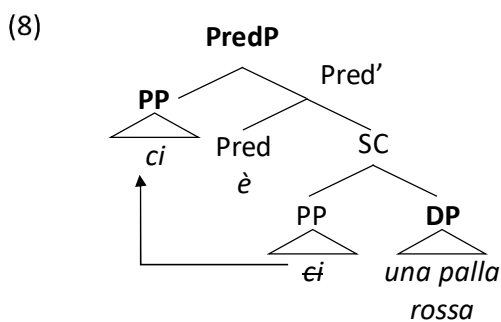
A note on predicative structures is needed. For copular clauses, I assume a small clause selected by a Pred(icative) P(hrase). The constituent raised to Spec,PredP is the syntactic subject of the sentence. Some cases are debated with regards to their structure; I will report here the relevant ones and how they were classified.

Only one member of the predication is present. When only one member of the predication is present, such that we only find the copula followed by a DP, the latter is the complement of the predication; the subject is a null pronoun *pro*.

- (7) a. è un bel (.) ponte . (Elisa 1;10.04)
 is a nice bridge
 ‘it/this is a nice bridge’



'There is' structures: quite frequent are the cases of structures with the locative clitic *ci* plus the copula *è*, as in *c'è una palla rossa* 'there is a red ball'. I take the clitic *ci* to be the subject of the predication and the DP to be its complement.



Where-questions: there are many occurrences of questions with *dov'è* 'where is', composed of the *wh*- word plus the copula. Antelmi (1997) claims that the copula is analysed as being part of the *wh*-word; in her longitudinal study on an Italian learner, she found that the copula starts to be inflected for number at age 1;11, but when inserted in this expression agreement is not realised until age 2;02. In this case, the DP has been coded as the subject of the predication; detailed results will be discussed separately.

3.3.6 Criteria for exclusion

All the words having adjectival use were included in the analysis: both adjectives and past participles, when used adjectivally (cfr. Tribushinina et al., 2014, p. 193). The main problem with this choice was to determine whether the participle had a verbal use or an adjectival use in the utterance. For example, an utterance like *rotta* ('broken'), in an early phase where functional morphology is missing, can be ambiguous. It can be taken to mean *è rotta* '(it) is broken', with a non-eventive, result meaning; in this case, only the copula would be missing, and the participle would be used as an adjective. However, it could also stand for *si è rotta* '(it) has broken'. In this case, the participle is used as part of the pronominal verb *rompersi* 'to break', and the omitted morphology amounts both to the copula and the reflexive clitic *si*. This kind of clitics are omitted for

quite a long period, so that, in fact, the overt realisation of the copula by itself is not definitive in disambiguating, as the clitic might still be missing (Belletti & Guasti, 2015, Chapter 3).

An additional possible source of ambiguity concerning adjectives is that between verbal and adjectival passives. A sentence like *the door is closed* might have a verbal reading, in which the door is undergoing the process of being closed by someone, or an adjectival one, in which the door is in a state of closeness.

These ambiguities are undesired, but, given our aim of investigating the acquisition of the syntax of adjectives, exclusion of all participles might have brought to loss of precious information. Lacking internal criteria, a strict contextual disambiguating criterion was used: whenever such participles were ambiguous between an adjectival and a verbal use, they were excluded; only contextually clear cases were kept for analysis. In some cases, the number of past participles has been specified in the results reported.

- (9) MOT: cosa c' è qua un palloncino ?
'what have we got here, a balloon?'
- MAR: (r)otto . [+ R] (possible verbal interpretation:
'broken' excluded from analysis)
- MOT: si è rotto , hai visto .
'it has broken, did you see?'

Formulaic expressions were also excluded when likely not to be analysed by the child as containing an adjective. These included *pronto* (literally 'ready') as used as standard answer at the phone, and the prepositional expression *da solo* 'alone' or 'by myself/himself/herself...', formed by the preposition *da* and the adjective *solo* 'alone'. Cases that were judged to be incorrect transcriptions were also discarded. Finally, words that were ambiguous between an adjective and a noun interpretation were eliminated. For instance, in a conversation between Marco and his mother in which the two are playing with shapes, *tondo* is likely to mean 'circle' and not 'round' (both meanings are possible in Italian).

3.4 Results

The four children studied produced a total of 14,108 utterances and 1,474 adjectives. Table 3.3 shows the distribution of data among children. MLU³⁷ has been calculated for children on a word per utterance basis (as opposed to morpheme per utterance, (cfr. Antelmi, 1997; Marinis, 2003)). For a detailed overview of the data distribution see Appendix A.2.

Child	Number of files	Age range	MLU range	Total utterances	Total adjectives (tokens)	Total adjectives (types)
Elisa	8 files	1;10-2;01	3,05-4,92	1077	72	27
Gregorio	8 files	1;07-2;00	1,36-2,35	922	83	23
Raffaello	17 files	1;07-2;11	1,24-3,81	3139	226	59
Marco	27 files	1;05-2;05	1,14-2,88	8970	1093	99

Table 3.3 General overview of children's data: number of files recorded, age and MLU range, total utterances and total adjectives (types and tokens)

Elisa is an early speaker, at age 1;10 her MLU is of 3,05 average words per utterance (superior to Marco's at age 2;05), and she produces long and well-structured utterances, with a rich vocabulary and almost adult-like nominal and verbal morphology. Functional free morphemes are present as well (determiners, auxiliaries, clitic pronouns, copula...). She produces 72 adjectives over a total 1077 utterances.

Gregorio, at the age of his first recording, is turning from the one-word to the two-word stage: his utterances consist either of single words or of two content words combined; grammatical morphemes such as verbal inflection, determiners, complementizers, etc. are absent (see(10)). At 2;00, the age of last recording, his utterances are more complex and include prepositions and further functional morphology (11), but they are still simplified. Gregorio is the only child in my corpus who is also studied by Cardinaletti & Giusti (2010).³⁸ He produces 83 adjectives over 922 utterances.

³⁷ MLU (Mean Length of Utterance) has been calculated for each file using the CLAN tool in CHILDES. An example of research line is: `mlu +t*CHI -t%mor 011004.cha`, where `+t*CHI` indicates the tier associated with the selected speaker, `-t%mor` the command that MLU should be calculated per word and not per morpheme, and `011004.cha` is the file for which the MLU should be computed. The criteria for MLU calculation are reported in the CLAN manual (MacWhinney, 2000, pt. 2, available at talkbank.org/manuals/CLAN.pdf).

³⁸ Cardinaletti & Giusti's calculation of Gregorio's adjectives is different from mine. They count 61 descriptive adjectives and 6 *altro* 'other', for a total 67 against my 83. This suggests that their selection criteria were different from those adopted here; since their article does not include such criteria, it is not possible to explain the source of this discrepancy.

- (10) a. (gat)tino mangia . (Gregorio 1;07.17)
 cat-DIM eats
 'the kitten eats/wants to eat'
- b. mangia (bis)cotto . (Gregorio 1;07.17)
 eats biscuit
- (11) chetta [: questa] è la locomotiva . (Gregorio 2;00.29)
 this is the locomotive

Both Raffaello's and Marco's production start at the one-word stage and develop over time; at the endpoint, Raffaello's MLU is higher than Marco's. Their final grammars include functional morphology (copulas, articles, auxiliaries), modal verbs and subordinate clauses. *Marco* is the child with the highest amount of data, he produces 1093 adjectives over 8970 utterances. As seen above, his recordings are also the most frequent and regular. Raffaello produces 226 adjectives; his recordings are not as long and frequent as Marco's.

In the remainder of this chapter some general results will be presented; a qualitative individual analysis for each child and interpretation will follow in chapter 4.

3.4.1 Adjective production

The first investigation addressed the form of the adjectival lexemes produced by each child with the aim to clarify whether there are common production patterns across children and whether there is a developmental trend. Figure 3.1 shows the development of mean adjective production over time (calculated as adjective/utterance). All adjectives have been considered, independently of their syntactic position. As shown in Figure 3.1, all children produce adjectives from their very first

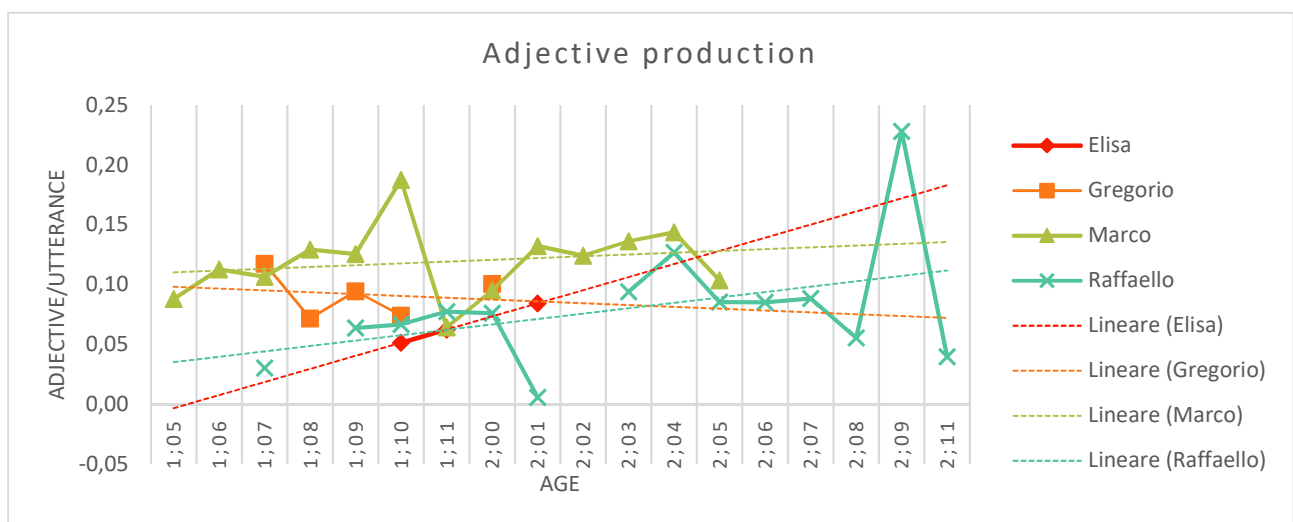


Figure 3.1 Mean adjective production (N adjective/N utterance per month)

recording. We find adjectives in Marco’s speech at 1;05 and in Gregorio’s and Raffaello’s at 1;07. Data for Elisa and Gregorio are probably too scarce to be significant, but Raffaello and Marco seem to show a production increase over time, although quantities are discontinuous.

I further considered the single adjectival lexical items produced by each child. Appendix A.3 report the adjective types produced by each child, with the indication of the age of first use and the total token production. Some generalisations emerge. First, the most frequent adjectives tend to be the first to appear. This is the case for *altro* ‘other’ and *bello* ‘pretty’ in Elisa; *brutto* ‘ugly’, *bello* ‘pretty’, *buono* ‘good’ in Gregorio, *bello* ‘pretty’, *grande* ‘big’, *brutto* ‘ugly’, *grosso* ‘big’ in Raffaello and most adjectives that make their appearance in Marco in the very first months: *grande* ‘big’, *piccolo* ‘little’, *rosso* ‘red’, *blu* ‘blue’, *verde* ‘green’ (1;05), *giallo* ‘yellow’, *altro* ‘other’, *brutto* ‘ugly’, *bello* ‘pretty’, *arancione* ‘orange’ (1;06), *bianco* ‘white’, *nero* ‘black’ (1;07).

There is a wide overlap in the adjectives produced. Of 139 total types, 41 are in common to at least two children; of these, 21 are in common to at least three and 7 types are produced by all children. Table 3.4 shows the number of adjective types produced by each child that are in common with at least another child. The results show that the rate of lexical items shared is quite high. For Marco and Raffaello, who are followed for a longer time, the overlap is higher in the first months and decreases over time. This suggests a strong initial correlation between children and a subsequent individual differentiation.

Child	Lexical items in common with other children				
Elisa	18/27	67%			
Gregorio	19/23	82%			
Raffaello	33/59	56%	[in the first months (1;07-2;03)	13/19	68%]
Marco	40/99	40%	[in the first months (1;05-1;11)	28/45	62%]

Table 3.4 Lexical items produced by more than one child (raw numbers and % of child’s total types). For Raffaello and Marco, also the data for the first months are given

These results can be compared with (Tribushinina et al., 2014)’s, who show how the correlation in adjective production between children and input is stronger at the beginning and weaker later on. Two factors are considered by Tribushinina et al. to be relevant in the first acquisition of adjectives: their distribution in Child Directed Speech (i.e., the input) and the conceptual complexity of their semantic class. An analysis of the input provided to the children was outside the scope of this work; therefore, no claim can be made thereon. Only semantic-conceptual complexity can be taken into account here. Indeed, if we look at the specific types, we see that they mainly denote concepts that

are ‘prominent in the world of a two-year-old toddler’ (Tribushinina et al., 2014, p. 210) (colour, size adjectives), relevant experiences in the child’s everyday life (*wet, broken, sick*), or common value judgments (value adjectives).

Lexical items in common to:	
all four children	altro, bello, malato, piccolo, rosso, grande, rotto
three children	blu, solo (foc), pronto, stanco, buono, brutto, alto, grosso, bianco, cattivo, forte, nero, bagnato, bravo
two children	morbido, verde, nuovo, pieno, viola, povero, giallo, lontano, lungo, diverso, dolce, arrabbiato, pulito, attento, avvelenato, aperto, chiuso, coperto, duro, seduto

Table 3.5 Lexical items produced by two, three or four children

As regards the morphological form of early adjectives, the most frequent do not appear in a single form, but show gender and/or number inflection alternations from the outset, as examples (12)-(14) show. Therefore, it is likely that they are not idiosyncratic forms, but that they are analysed as a lexical item plus an agreement morpheme.

- (12) a. xxx b(r)ut(t)o . (Gregorio 1;07.17)
ugly-MASC.SG
- b. cappe [: scarpe] bute [: brutte] . (Gregorio 1;07.17)
shoes ugly-FEM.PL
- (13) a. ocio [: rosso] . (Marco 1;05.04)
red-MASC.SING
- b. oocia [: rossa] . (Marco 1;05.04)
red-FEM.SING
- (14) a. bello . (Raffaello 1;07.07)
pretty-MASC.SING
- b. belli ! (Raffaello 1;07.07)
pretty-MASC.PLUR

This is in contrast with Noccetti’s (2015) results for Rosa and Camillo, for whom she finds that they produce adjectives as rote-learned items in only one form of the paradigm until age 2;00. What is more, Rosa does not match them in gender and number with their referent. The children analysed here instead show number and gender agreement from 1;05/1;07.

3.4.2 Semantic classes

In the previous section, I analysed the occurrence of common adjectival lexical items. Let us see now how the preference for semantic classes compares between children. Is there a comparable overlap of more frequent semantic classes, or do children display individual preferences?

Figure 3.2 shows the overall frequency of semantic classes calculated per tokens in the speech of each child. The production is not equally distributed among classes; the most produced ones are value, colour, dimension physical property and *altro*. Moreover, it is not uniform across children.

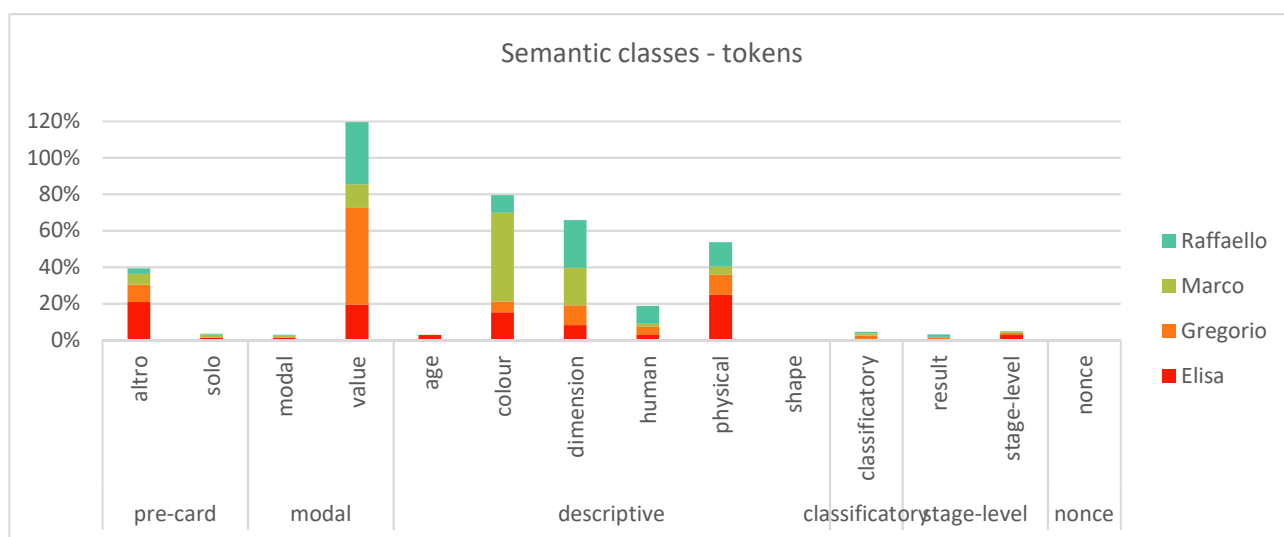


Figure 3.2 Overall frequency of semantic classes (divided per tokens) [100%=child's total production]

Detailed raw data are reported in Tables A.10-13. Marco produces a high majority of descriptive adjectives, especially colour ones; this class alone counts 531/1093 tokens, 49% of his total production. They are followed by dimension adjectives (N=224, 21%) and value adjectives (N=142, 12%). These three classes cover 82% of the adjectives produced; the human propensity and physical property classes are hardly relevant. Raffaello's production is more distributed. His most frequent class is that of value (modal) adjectives, (N=77/226 tokens, 34%), followed, for descriptive adjectives, by dimension (N=59, 26%) and physical property (N=30, 13%). Gregorio's most frequent classes are the same as Raffaello's, but Gregorio's share of value adjectives (N=44, 53%) is markedly superior to dimension (N=9, 11%) and physical property (N=9, 11%). The predominance of *value* adjectives in Gregorio's speech is due to a very high rate of *bello*, with 21 tokens, a fourth of his total production; this item appears at age 1;08 and is then always present. Furthermore, the second most frequent lemma is also an evaluative adjective, *brutto* 'ugly', which appears at age 1;07 and counts 10 tokens. Finally, Elisa also shows a more distributed production between types; her most frequent

are physical property (N=18 tokens, 25%), value (N=14, 19%), *altro* (N=15, 21%) and colour (N=11, 15%). Value adjectives actually count only three types; the predominant one is *bello*, with 12 tokens. Figure 3.3 shows the overall frequency of types for each category. Value, colour, dimension, human propensity and physical property have the majority of types. The latter counts the highest number, contrasting with the distribution of tokens, where physical property is less frequent than colour, value and dimension adjectives. This means that physical property adjectives occur with more types, which only have a few occurrences each.

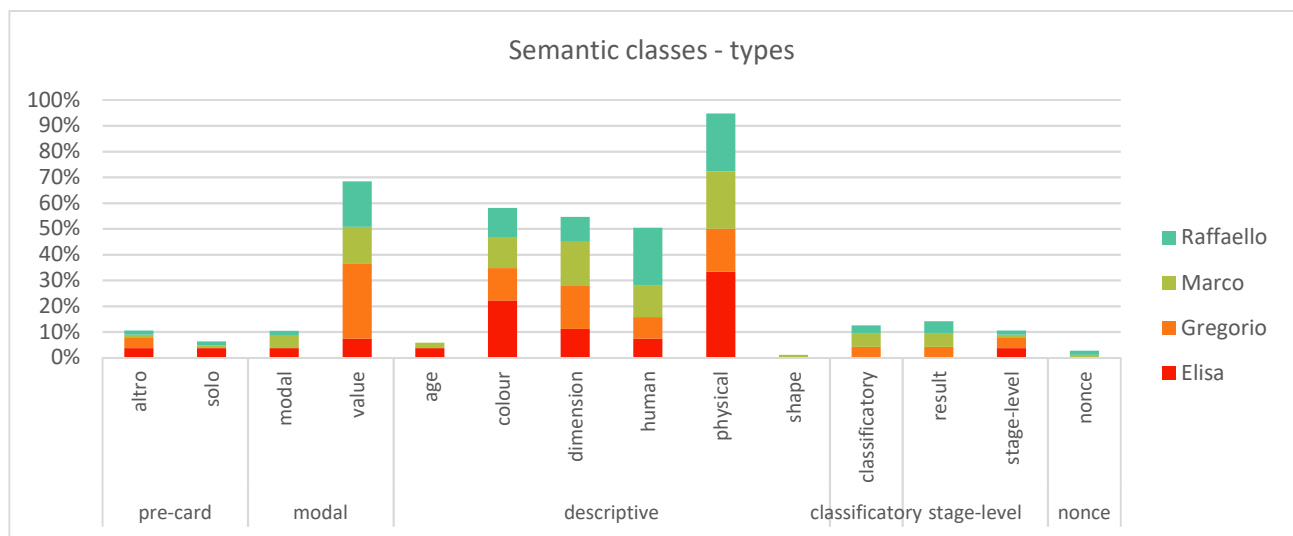


Figure 3.3 Overall frequency of semantic classes (divided per types) [100%=child's total production]

Some semantic types (age, shape, classificatory, modal adjectives other than value) are present only with few types and tokens. Other classes are not present at all. Among those produced by the children in Tribushinina et al.'s (2014) study, there are no temporal and epistemic adjectives; also material and origin adjectives are missing.

It should be noted that, if past participles are removed from the analysis, physical property is the most affected category both for types and tokens, as most participles are found here (67% tokens). Many are also found in the classificatory, result and human propensity types. Removing them, however, would not subvert the trends outlined for each child with regards to token frequency of each class; as concerns type frequency, physical property loses its primate and takes the fifth place instead.

Human propensity and physical property are varied; they collect various subclasses. Figure 3.4 and Figure 3.5 offer an overview of how the subclasses are distributed. In the human propensity class, physical state is the majority (N=26), followed by internal state (N=13) and behavioural (N=5). More

than half of physical property adjectives are *configuration* (N=58), i.e., adjectives like *aperto* ‘open’, *chiuso* ‘closed’, *rotto* ‘broken’, etc. Most participles are here. Other classes are consistency, wetness and temperature; here participles are not much relevant, with the exception of *bagnato* ‘wet’.

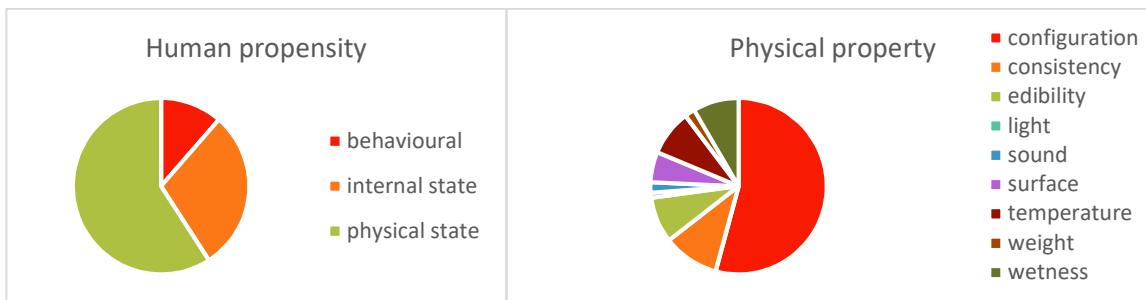


Figure 3.4 Subclasses of human propensity adjectives Figure 3.5 Subclasses of physical property adjectives

3.4.3 Syntactic position

I turn now to the analysis of the syntactic position of the adjectives produced. Figure 3.6 shows the overall proportion of adjectives in each position.

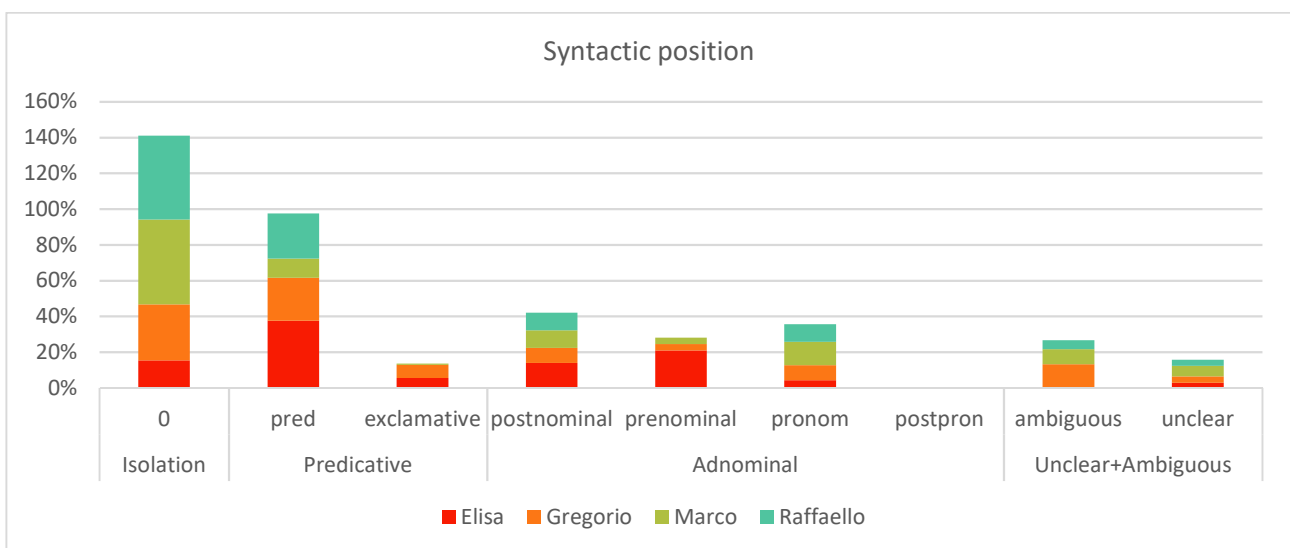


Figure 3.6 Overall frequency of adjectives' syntactic position [100%=child's total production]

The majority of adjectives is produced in isolation; when not in isolation, adjectives are comparably frequent in postnominal and adnominal position³⁹. Marco and Raffaello produce a majority of

³⁹ The proportion out of the total tokens of adjectives is 16% for predicative adjectives and 26% for adnominals. This unbalance is due to Marco's data. Marco is the only child whose adnominal adjectives outnumber predicative ones, but his data are way more numerous in terms of tokens and unbalance the count. Therefore, as in the previous graph, the proportion has been obtained by adding up the individual proportions.

adjectives in isolation. Marco produces 48% in isolation, 27% adnominal and 11% predicative adjectives. Raffaello produces 47% in isolation, 25% predicative and 19% adnominal. Gregorio produces 31% in isolation and 31% predicative adjectives; 20% are adnominal. Elisa, instead, shows a low rate of isolated adjectives (12%) and a high majority of predicative (43%) and adnominal ones (39%).

A more detailed analysis, considering development over age for each child, will be carried out in chapter 4. I will give a first overview here, detailed raw data for adjective positioning over age may be found in Tables 14-17 in the Appendix. Marco, Gregorio and Raffaello show a similar acquisition sequence. Adjectives are produced first in isolation, i.e., not (overtly) inserted in a syntactic configuration. The first construction they appear into is the predicative one, more specifically, they start being lexicalised after a copula (Gregorio: 1;08, Marco: 1;06, Raffaello: 1;10)⁴⁰. Note that, although adjectives in postcopular position do not seem to be very frequent in the first months, many adjectives in isolation are likely to be either predicates with a non-lexicalised copula, or exclamative utterances, as in (15)-(16).

- | | |
|---|---------------------|
| (15) bello !
'nice' | (Raffaello 1;07.07) |
| (16) <n@p tattiva> [>] (.) tattiva .
'(you are) naughty' | (Raffaello 2;00.10) |

Adjectives unambiguously appear inside a DP only later. Gregorio's first cases are at 1;09. The first instances in Marco are found at age 1;06/7, but they are three occurrences of *solo* 'only', used as a focaliser. The first adjectives appearing in a DP with an overt noun come two months later, at 1;08. Raffaello produces only one complete DP at 1;11, but it is a case of *altro* 'other', used pronominally. After this, adnominal adjectives become productive at age 2;05.

Once adnominal adjectives appear, they outnumber predicative ones in Marco's speech; Gregorio produces them with equal frequency. The proportion of adnominal adjectives in Raffaello's speech at 2;05, when the child starts to use them productively, is quite high (65%). After that, the value oscillates between a majority of adnominal and of predicative adjectives.

⁴⁰ *Predicative adjectives* in this sense should not be confused with the notion introduced in the first chapters of 'adjectives with a predicative interpretation', namely *indirect modification* ones. In this part, with *predicative adjective* will be meant an adjective which is found in predicative position, i.e., after a copula or a predicative verb.

Elisa's data refer to a developmental stage which is far more advanced than the other children; therefore, the path outlined cannot be recognised in her production. She shows an initial higher frequency of adnominal adjectives and an increase in predicative ones over time. This rise correlates with a higher number of past participles: at 2;01, out of 16 adjectives in predicative position, 11 are past participles.

Concerning adnominal adjectives, postnominal and pronominal ones are more frequent than prenominal ones. Again, children show different patterns. Elisa's prenominal adjectives are 21% of her total token production; postnominal are 14% and pronominal ones 4%. Gregorio postnominal and pronominal are 8% and prenominal ones are 4%. Raffaello produce no prenominal adjectives (0%) and an equal rate of postnominal and pronominal ones (8%). Marco's pronominal adjectives are 13%, postnominal ones are 10% and prenominals are 4% of the total.

Elisa produces both prenominal and postnominal adjectives from the outset, with a prevalence of prenominal adjectives at 1;10 (due to a high percentage of *altro* 'other'). Later, the production of pre- and postnominal adjectives is balanced. The production of adnominal adjectives without a lexicalised noun is scarce (3 total tokens). In Gregorio, we see a first production of postnominal and pronominal adjectives, whereas prenominal ones only appear at age 2;00, the last month recorded. Raffaello only produces postnominal and pronominal adjectives, but not prenominal ones. As seen above, there is only one token of *solo* used pronominally at age 1;11; otherwise, adjectives are productively used in a DP from age 2;05.

In the speech of Marco, pre- and postnominal adjectives both appear at age 1;08. Postnominal adjectives are always more numerous than prenominal ones. Marco's most frequent production is of adjectives in pronominalized DPs; he omits the noun very frequently, both in adult-like and non-adult-like structures. A detailed analysis is carried out in section 4.1.4.

Interaction between semantic class and adjective position

Section 3.4.2 described the production of adjectival semantic classes, while the first part of section 3.4.3 investigated the syntactic position of the adjectives produced. In this subsection, I will explore the possibility of a relevant interaction between the semantic class of adjectives and their syntactic position. Table 3.6 shows a general overview.

ADJ POSITION		Isolation	Adnominal				Predicative		Unclear + Ambiguous		Total
SEMANTIC CLASS			0	postN	preN	pronom	postpron	pred	excl	ambiguous	
MODAL CLASS	classificatory	7	8		1		1		1		18
	modal	2	3	1	1		5			2	14
MODAL CLASS	value	129	10	11	10	1	57	18	29	12	277
	dimension	135	41	10	19		45		28	20	298
DESCRIPTIVE	physical property	31	6		5		52	1	6	6	107
	age	2	2				1				5
	human propensity	11	3				29			1	44
	shape	4			1						5
	colour	323	69		83		21		47	26	569
PRE-CARD	altro	9	1	35	39				2	8	94
	solo	1			17					2	20
STAGE-LEVEL	result	4	3				4				11
	stage-level	5					5				10
	nonce		1						1		2
Total		663	147	57	176	1	220	19	114	77	1474

Table 3.6 Semantic type of adjectives produced in each position in the speech of the four children

Tables A.18 – A.25 in the Appendix show in detail to which semantic class adjectives in each position belong across age.

Some important observations can be made. Prenominal adjectives are *altro* ‘other’, value adjectives, dimensional adjectives and the modal *vero* ‘true, real’. Specifically, dimensional adjectives are the core size ones, namely *grande* ‘big’, *grosso* ‘big’, *piccolo* ‘small’. Marco produces all of them, Elisa produces *altro*, one value (*bello*) and one size (*grande*), Gregorio only *altro* and the evaluative *bello*. Raffaello does not produce any adjective in prenominal position.

Adjectives in postnominal position are more varied. We find again value and dimension⁴¹, but also colour, physical property, human propensity, classificatory, modal, age, result. Gregorio only produces colour, size and value. Marco’s production, in the first months (1;08-2;00) is limited to dimension, colour and value adjectives⁴². Colour adjectives, in particular, have a great importance in Marco’s production. They are predominant at almost all stages in postnominal and pronominal position. Raffaello produces mainly dimension adjectives, but three categories are already present at age 2;05 (value, dimension, human propensity, plus a novel word). Considering which adjectives

⁴¹ *Altro* also appears once in postnominal position in Marco. This is in fact a case of double determiner, that will be examined in section 4.1.4.

⁴² Excluding, at age 2;00, the production of a classificatory/idiomatic adjective, namely *filanti* in *stelle filanti* ‘streamers’.

appear both pre- and postnominally, we find that these are all *dimension* and *value* adjectives, plus the modal *vero* ‘real’.

Adjectives used in pronominal DPs show a distribution similar to postnominal ones as concerns value and descriptive adjectives; only *altro* ‘other’ and *solo* differ. *Altro* occurs as much in prenominal as in pronominal position; *solo* ‘only’, always used as a focaliser, is always pronominal. Adjectives that are both pronominal and adnominal are dimension, colour, value and *vero* ‘true’, *altro* ‘other’, *solo* ‘only’.

As regards predicative adjectives, the proper predicative position hosts all classes of adjectives except pre-cardinal ones. Physical property and human propensity are consistently more frequent in predicative position than in the adnominal one, as opposed to the other categories; this finding is relevant with Balckwell’s for English. In exclamative position, instead, we find value adjectives, plus one physical property: *che mo(r)bido !* (Gregorio, 2;00.29), which is compatible with an evaluative reading.

3.4.4 Interaction with noun and determiner

One of the aims of this research is to contribute to the study of the acquisition of the DP, in the aspects that are related to adjectival syntax. For this purpose, I considered the interaction between various parameters that could potentially influence the distribution of adjectives and determiners within the DP: the type of noun, the syntactic position of the adjectivally modified DP and the position of the adjective itself.

Noun

In this subsection, two issues will be addressed. 1) Is the type of noun relevant in the early production of adjectives? 2) Are early adjectives tied to a recurrent nominal, or do they combine freely with different nouns? Figure 3.7 shows the types of noun that adjectives occur with: count singular (NCS), count plural (NCP), mass (NM) and proper names (NP).

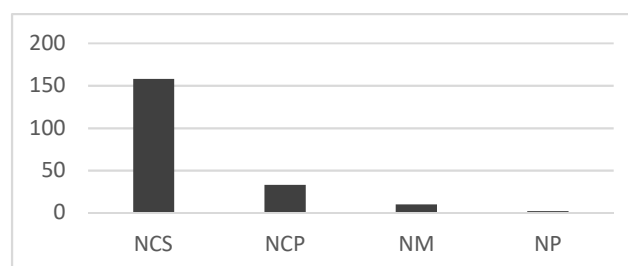


Figure 3.7 Types of adjectivally modified nouns

In general, all four children produce a majority of singular count nouns. Mass nouns and proper names are scarce; only Marco and Gregorio produce them, while Elisa and Raffaello only produce count nouns. Gregorio is the only child who does not produce any plural count noun modified by an adjective.

Tables A.26-A.29 report raw data over age for each child. Marco produces adjectives mainly with singular count nouns (N=110/145 tokens). Plural count nouns modified by adjectives are produced consistently from age 2;00, except a single token at age 1;10. Adjectives modifying mass noun are rarer (N=9), and there is only one proper name⁴³.

Raffaello and Elisa use adjectives only to modify count nouns; the most frequent are again singular ones (N=19/23 and 21/26 respectively). Gregorio produces eight count singular nouns, one mass noun and one proper name. He does not produce any plural modified by an adjective.

We turn now to the second question: are early adjectives tied to a recurrent nominal, or do they combine freely with different nouns? This issue might have two facets. On the one hand, an adjective type may always occur with a single noun, such that there is a fixed ADJ-N association (e.g., red ball); the adjective is then generalised to the modification of other nouns (red ball, red cup, red doll). Alternatively, adjectival modification may be tied to a single nominal lexical item, in the sense that only one (or a few) nouns can be modified at the beginning (e.g., 'ball': red ball, big ball, blue ball, nice ball); in this case, the child would have a partially abstract representation formed by the noun and an open slot for an adjective (___ball), subsequently, adjectival modification would be extended to all noun types.

To investigate the first possibility, we need to look at the production in the DP of the most frequent adjectives, and see if they start being produced with a recurrent noun. Marco's data provide the best chance of conducting a fine-grained analysis and individuating any potential pattern in this sense. Marco's production of *grande* 'big', in the first months (1;08-2;01), modifies *coco* 'hen', *oca* 'goose', *palla* 'ball', *aeroplanini* 'airplanes'. Similarly, *rosso* 'red', between 1;08 and 2;00, modifies *spicchi* 'slices', *matita* 'pencil', *cestino* 'basket', *macchina* 'car'; and *altro* 'other' modifies *bandierina* 'flag', *nido* 'nest', *palla* 'ball', *triangolo* 'triangle', *pallina* 'little ball'. Thus, the answer is that each adjective is not associated with a single noun at the outset.

⁴³ The name is *Cappuccetto Rosso* 'Little Red Riding Hood', therefore the adjective is in fact part of the name itself.

Considering the second possibility, is adnominal adjectival modification first available only for a limited set of nouns and then extended to all nouns? Table 3.7 reports all the noun types modified by Marco in the first four months of adnominal adjective production (repetition of the same noun-adjective occurrence in the same context has not been counted). It is not the case that only one or a few lexical items are modified by adjectives at first; nor can the noun types be identified by a single feature (only animate referents, animals, kinship terms), other than having concrete referents⁴⁴.

There is a frequent occurrence of *palla* ‘ball’ and related nouns (*pallina*, *pallone*, *palloncino*); in the age range 1;08-1;11 they occur with colour adjectives seven times. This, however, might not be interpreted as significant, but as related to the fact that Marco and his mother play with coloured balls many times in the course of the recordings⁴⁵. Alternatively, this lexical item might have played a role in building noun-adjective combinations and initiating the building of adjectival syntax in the DP.

1;08	1;09	1;10	1;11
coco ‘hen’	naso ‘nose’	pulcino ‘chick’	mais ‘maiz’
oca ‘goose’	uomo ‘man’	pinguino ‘penguin’	palloncino ‘balloon’
palla ‘ball’	palloncino ‘balloon’	nido ‘nest’	
bandierina ‘flag’	pecora ‘sheep’	palla ‘ball’	
	palla ‘ball’	palla	
		palla	
		spicchio ‘slice’	
		spicchio	
		pallone ‘ball’	
		stella ‘star’	

Table 3.7 Nominal lexical items modified by an adjective in the first months of Marco’s speech (1;05-1;11)

A last consideration regards the type of nominal that is modified. Children only produce object-denoting nouns, never event-denoting ones. This is relevant because nouns that denote events are modified by different types of adjectives, such as thematic adjectives. Instead, as children only produce object-denoting nouns, they only use adjective denoting object properties.

⁴⁴ Cfr. Noccetti (2015), who reports that adjectives are better understood when they are related to basic-level object categories.

⁴⁵ Besides, it is not clear that they all classify as the same lexical item. In fact, only *pallina* has been tagged as a form of *palla*, whereas *pallone* and *palloncino* have been considered two separate items.

Syntactic position of the DP

The lexicalisation of the determiner is connected to the syntactic position of the DP, as seen in chapter 1, section 1.6.1. In this subsection, I will report the data concerning the position in which adjectivally modified DPs occur, as shown in Table 3.8.

DP position	ELISA	GREGORIO	RAFFAELLO	MARCO	Total
isolation	9	11	11	185	216
ambiguous			1		1
arg	7	2	21	40	70
obj	6	1	17	35	59
PVsubj		1	1	3	6
subj			3	2	5
adv	1				
pred	12	4	6	40	62
comp	9	4	6	16	35
excl				3	3
subj	3			21	24
prep	1		5	27	33
prep	1		5	27	33
Total	29	17	44	292	382

Table 3.8 Syntactic position of adjectivally modified DPs

Marco produces most of his DPs in isolation, unlike the other children; if we consider only DPs in an identifiable structure (argumental, predicative, prepositional), Elisa produces more DPs in predicative position (12 vs 7), Raffaello more in argumental position (21 vs 6) and Marco is balanced between the two (40 and 40).

Refining the analysis by considering individual development (Tables 21-24 in the Appendix), as said before, the majority of Marco's DPs are in isolation. At age 2;00 we find a robust increase of DPs in an identifiable syntactic position (before, they are rare and sparse).

As regards their syntactic function, we see an asymmetry between predicative and argumental DPs. In argumental position, we have 35 objects (the first at 1;09) and only 5 subjects, 3 are postverbal (the first at 1;10) and 2 preverbal (the first at age 2;05).

Among predicatives, instead, 16 are complement of the predication; 3 are exclamative and 21 are subjects. Of the latter, however, the majority (17/21) is the subject of a *wh*-question like *dov'è* 'where is' and *cos'è* (what is). Where-is questions are the most frequent, but the copula does never show agreement with the plural subject, when this occurs (cfr. examples (17)-(19)); whereas one what-is question shows plural agreement (17). This suggests that, as claimed by Antelmi (1997),

dov'è is produced at first as an unanalysed chunk, in which the copula is part of the *wh-* word. Two predicative subjects occur in declarative sentences with locative adverbs, as in (18). The examples in (19) show the only two cases of a complete copular structure, with both lexicalised DPs. The DP containing the adjective is always the preverbal subject. In both cases, agreement of the copula is with the plural element, which is the subject in the first case and the complement of the predication in the second case.

- | | | |
|---------|--|-----------------|
| (17) a. | dov' è pitola [: pistola] gialla ?
where is gun yellow
'where is the yellow gun?' | Marco (2;00.14) |
| b. | dov' è [<] quille [: quelle] bianche ?
where us those white
'where are the white ones?' | Marco (2;00.14) |
| c. | cosa sono que(s)ti rossi ?
what are these red
'what are these red ones?' | Marco (2;01.27) |
| (18) | son(o) là le altre .
are there the others
'the other ones are there' | Marco (2;01.11) |
| (19) a. | sti [: questi] neri sono l' uva . [+ r]
these black are the grape
'these black ones are grapes' | Marco (1;10.12) |
| b. | pete [//] peto [: questo] vioa [: viola] son(o) lamponi .
this purple are raspberries
'this purple one is raspberries' | Marco (2;04.13) |

Raffaello does not show a sharp increase in his production; his data are not as rich as Marco's. We find a single DP at 1;11, in predicative position with the presentative *ecco*. Otherwise, the first non-ambiguous ones appear at age 2;05. At this age, we already find one postverbal and two preverbal subjects. Conversely, DPs in predicative position are always complement, never subject of the predication.

Gregorio produces only 6 DPs in a recognisable syntactic environment; 4 are predicative DPs in complement position and 2 are arguments, one object and one postverbal subject.

Lexicalisation of the determiner

Is the determiner lexicalised in the adjective-containing nominal expressions? How does this parameter interact with the adjective's position? Table 3.9 shows the proportion of lexicalised (LEX

ART) and non-lexicalised (0 ART) determiners in the speech of the four children⁴⁶; there does not seem to be a relevant difference between pre- and postnominal adjectives.

ADJECTIVE POSITION	0 ART	LEX ART	Total
postnominal	30%	70%	100%
prenominal	25%	75%	100%
Total	28%	72%	100%

Table 3.9 Lexicalisation of the determiner with pre- and postnominal adjectives (all children)

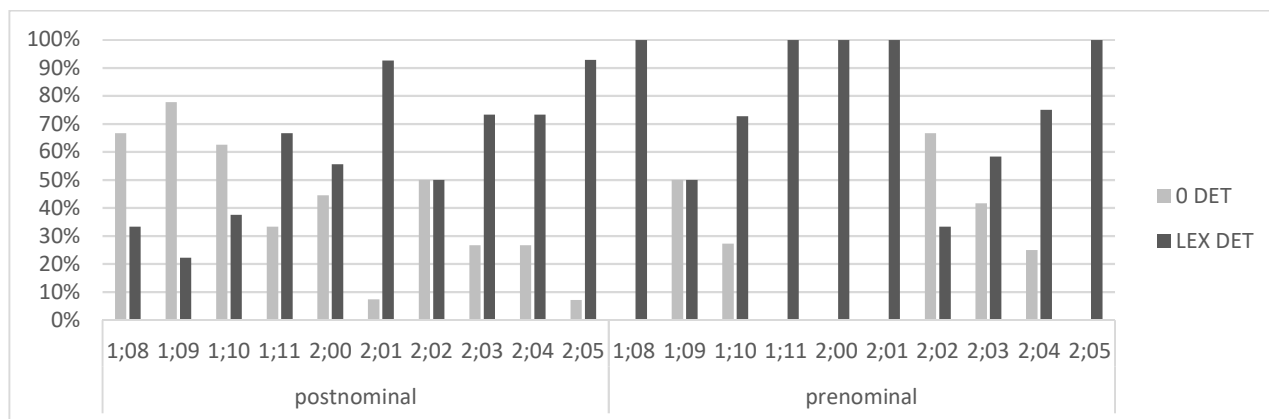


Figure 3.8 Lexicalisation of the determiner with pre- and postnominal adjectives (all children) – age 1;08-2;05

Further, Figure 3.8 shows the same data over age (the age range 1;08-2;05 has been selected as the most relevant; before this age none of the children produces adjectives in a DP). The figure clearly shows that adjectives and determiners never are in complementary distribution, even in the first productions. Although the determiner is frequently missing (42% of the times), even from the very first months it is sometimes present both in pre- and postnominal position.

In order to check whether this observation holds for each child's production, I performed a more refined analysis. Tables A.30-A.33 in the Appendix show the development of each individual, the production of DPs⁴⁷ with or without a determiner and whether they are grammatical in the adult language. Elisa only produces complete DPs; the determiner is always lexicalised, and the productions are target-like.

(20) è una gallina piccolina (.) hai capito ? [+ R] (Elisa 1;10.04)
 is a hen small-DIM . have understood
 'It is a small hen, did you understand?'

⁴⁶ This parameter has been obtained by filtering in lines with the parameter PRESENCE OF NOUN: *present* and by grouping the DET_TOKEN field with value 0 as '0 DET' on one side and all the other values as LEX DET on the other.

⁴⁷ The label DP is conventional, as some nominal expressions might not be DPs but lower maximal categories.

Gregorio starts producing adnominal adjectives at 1;09. The majority appears with a determiner (N=6; 67%); when the noun is bare, only one is a non-target utterance. At age 1;11 he only produces one noun + Adj, without determiner and non-target. At age 2;00 the same pattern repeats, with 5 lexicalised determiners (71%) and two determiner-less DPs, one of which is non-target.

- (21) a. che naso g(r)os(s)o. (0 DET, target) (Gregorio 1;09.24)
 how nose big
 'what a big nose'
- b. topino bianco xxx guadda [: guarda] il +... (0 DET, non-target) (Gregorio 1;09.24)
 mouse-DIM white look the
 'look at the little white mouse'

Raffaello's production of adjectives in a DP starts at 2;05. The great majority shows a lexicalised determiner (N=37/41, 90%); in three out of four cases, determiner-less DPs are not grammatical in the target language.

- (22) prendo 0w foio pulito eh ! (0 DET, non-target) (Raffaello 2;05.13)
 take sheet clean
 'I'll take a clean sheet of paper'

As before, Marco's production allows a more detailed analysis than the other children. In his speech determiners are missing more frequently, but realised determiners prevail (N=228/278, 82%). This holds for all developmental stages: from the outset, lexicalised determiners prevail on non-lexicalised ones. At first (1;08-1;10), missing determiners are all non-target like (i.e., they are omitted from obligatory contexts); from age 2;00 onwards, they become less frequent than target-like utterances.

- (23) a. è coco@o grande . (0 DET, non-target) (Marco 1;08.03)
 is hen big
 'it's a big hen'
- b. rompono banane carote che@wp ma [: mais] giallo . (mass, 0 DET, target)
 break bananas carrots also maiz yellow (Marco 1;11.16)

In general, the data examined above do not seem to imply a developmental stage in which adjectives and determiners are in complementary distribution. However, caution is needed in interpreting this result: because many cases of utterances consisting only of a noun and an adjective have been coded as ambiguous, such stage might be present but obscured in the data. Further,

there does not seem to be a clear development concerning the target and non-target use of determiners in the utterances analysed common to all the children, although it seems that from age 2;00 the presence of non-target uses decreases. In the next subsections, I will combine the parameters analysed so far; a detailed qualitative analysis will be carried out in chapter 4 for each child to describe the interaction of determiner, noun type and adjectival syntax.

Determiner and adjective position

The relation between adjective position in the DP and the type of article is investigated in Table 3.10. The data show that adnominal adjectives mainly occur with definite and indefinite articles (33% and 32% respectively); these appear in all the forms of the paradigm. Prenominal adjectives, in fact, only occur with articles. Postnominal adjectives, instead, although not frequently, may also occur with other kinds of determiners (partitive article, demonstrative, numeral, universal quantifier), namely, phrasal determiners. The children do not have a uniform behaviour. Gregorio and Raffaello only produce them with definite and indefinite articles; Elisa uses a demonstrative twice; the partitive, the numeral and the two quantifiers appear in the speech of Marco.

ADJECTIVE POSITION	No article	Definite						Indefinite			Partitive	Demonst.	Numeral	Quantifier	Unclear	Total
	0	il	l	la	i	gli	le	un	un(a)	una	delle	quel	due	tanti	unclear	
ambiguous	1															1
postnominal	42	8	17	20	3	2	9	17		18	1	2	1	2	4	146
prenominal	13		5	3			1	16	12	3					4	57
Total	56						68			66	1	2	1	2	8	204

Table 3.10 Type of determiner in DPs modified by pre- and postnominal adjectives in the speech of the four children

Type of noun and position

Table 3.11 shows a combination of various parameters. The postnominal and prenominal position of the adjective have been checked against the noun type they modify and the lexicalisation of the determiner. Because prenominal adjectives are less numerous than postnominal ones, the data are shown in percentage (type of noun: % over position of adjective).

ADJECTIVE POSITION	postnominal	prenominal	Total
NCS	75%	87%	78%
0 ART	31%	20%	28%
LEX ART	69%	80%	72%
NCP	18%	8%	16%
0 ART	15%	75%	23%
LEX ART	85%	25%	77%

NM	5%	6%	5%
O ART	29%	33%	30%
LEX ART	71%	67%	70%
NP	1%	0%	1%
O ART	100%		100%
Total	100%	100%	100%

Table 3.11 Position of the adjective per type of noun, with lexicalisation of the determiner
[second-level row: O ART/LEX ART = % first-level row]

The results are as follows. As seen above, mass nouns are not very frequent; we see that their frequency is comparable with postnominal and prenominal adjectives. Count nouns show a slight difference. Although the proportion is similar, plural nouns occur less frequently with prenominal (8%) than with postnominal adjectives (18%). What is more, the preN/NCP (plural count noun plus prenominal adjective) combination shows an asymmetry with respect to the lexicalisation of the determiner. Whereas in all other cases the proportion of lexicalised determiners is much higher than non-lexicalised ones (ranging between 67 and 85%), preN/NCP has the opposite trend: non-lexicalised determiners outnumber lexicalised ones.

To determine the reason for this inverse trend, I have examined the specific productions and have found that this reversal is not due to a higher omission, because the productions are always target-like. What emerges instead is that the preN/NCP combination corresponds to only four productions in which the prenominal adjective is *altro* 'other'. There are no DM prenominal adjectives other than this with a plural noun, whereas postnominal adjectives with plural count nouns are present (from various semantic classes: colour, dimension, physical property, human propensity...).

This result may be combined with the one in the previous subsection, namely that prenominal adjectives only occur with articles, whereas postnominal adjectives may occur with also phrasal determiners. Notice that, except for the demonstrative, the other determiners in Table 3.11 are plural (the partitive, numeral and quantifier). Are these two results correlated? Is there a common explanation for them? This issue will be resumed in chapter 4, where I will propose a tentative analysis.

3.5 Conclusions

In the analysis outlined in Section 3.4 some important generalisations have emerged.

- 1) Children produce adjectives at a very early age.

- 2) Early adjectives are inflected for number and gender.
- 3) There is a high commonality of early adjectival lexical items between children.
- 4) The semantic classes that are produced more frequently are value, colour and dimension, followed by *altro* and physical property.
- 5) Adjectives are produced mainly in isolation; the predicative function is preferred to the adnominal modification one.
- 6) Among predicative adjectives, the postnominal position is the most frequent, followed by adjectives in pronominal DPs. Prenominal adjectives are less frequent.
- 7) Adjectives do not occur with only some frequent nominal types at an early stage; the nouns that adjectives occur with seem to alternate freely.
- 8) Determiners are not in complementary distribution with adjectives; there appears to be optionality in the realisation of the determiner in adjective-containing DPs.
- 9) There is an asymmetry between prenominal and postnominal adjectives. Prenominal adjectives never modify a plural DP and only occur with articles (and no other determiner), whereas postnominal adjectives may modify both singular and plural nouns and co-occur with phrasal determiners.

These results will be integrated with an individual analysis of each child's production and extensively discussed in chapter 4.

Chapter 4. Analysis and discussion

4.1 Individual development

4.1.1 ELISA

Semantic acquisition

Elisa’s production is the most advanced of the four children; her production is target-like 100% of the times. Figure 4.1 and Figure 4.2 show the development over age of her production of semantic classes, in general and in detail for descriptive adjectives. At first, she produces a majority of pre-cardinal adjectives (*altro*); in the subsequent months, value and descriptive ones prevail. Specifically, we observe an increase of physical property adjectives correlating with an increase of past participles, which are mostly in this category.

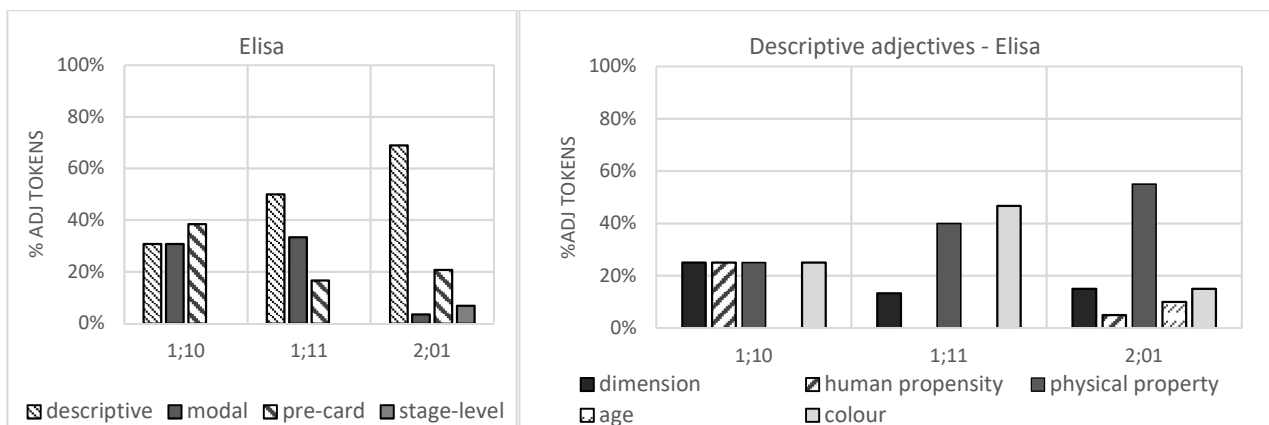


Figure 4.1 Semantic groups across age in the speech of Elisa

Figure 4.2 Descriptive adjectives across age in the speech of Elisa

Value adjectives are represented by only three types; the most frequent is *bello*, with 12 tokens. Noticeably, this item shows a rich paradigm, as it appears in many different forms. It shows gender and number inflection, and occurs once in the superlative form *bellissimo*. When postnominal, *bello* appears in the target prenominal masculine form *bel* (cfr. Chapter 1, p. 25), as in (1); this means that Elisa learned the relevant alternation and the syntactic operation involved in its derivation. Colour adjectives are more distributed (6 types, 1 to 3 tokens each).

(1) è un bel (.) ponte .
 is a nice bridge
 'it is a nice bridge'

(Elisa 1;10.04)

Syntactic acquisition

Figure 4.3 and Figure 4.4 show Elisa's individual development in the syntactic positioning of adjectives.

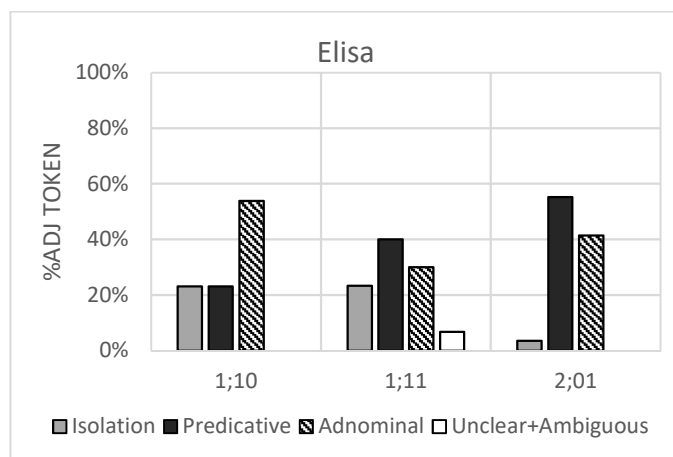


Figure 4.3 Adjective position across age in Elisa's speech

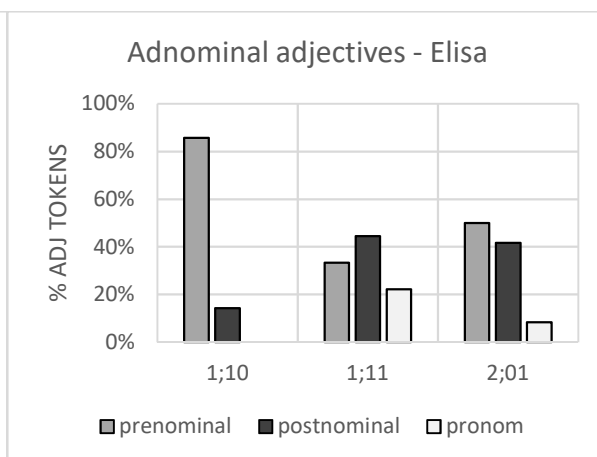


Figure 4.4 Adnominal adjectives across age in Elisa's speech

At 1;10, Elisa shows an initial higher frequency of adnominal adjectives, with a subsequent rise of predicative ones. Adnominal adjectives are mostly prenominal; this is due to a frequent occurrence of *altro* as prenominal modifier (2).

- (2) a. no (.) perché la nonna cerca un altro paio di [/] di scarpe . (Elisa 1;10.04)
 no because the granny looks-for another pair of shoes
- b. questo lo mettiamo qua all' altro lettino.⁴⁸ (Elisa 1;11.19)
 this it.CL put here at-the other bed
 'this one, we put it here on the other bed'

One month later, predicative adjectives outnumber adnominal ones, and reach a peak at age 2;01. At this age Elisa produces only one adjective in isolation (the superlative *bellissimo*) and none is unclear or ambiguous. In what follows, I will examine adnominal adjectives first and predicative adjectives afterwards.

⁴⁸ There is a mistake of lexical selection which has not been considered. Elisa selects the incorrect preposition; the target-like phrase would have been *nell'altro lettino*. Nevertheless, both the article and the preposition are realised and merged together in an articulated preposition, as in the adult language; the utterance has been coded as target.

The first question I address is the semantics-syntax mapping, i.e., which semantic classes appear in adnominal position. Figure 4.5, Figure 4.6 and Figure 4.7 show the distribution of semantic classes for prenominal, postnominal and pronominal adjectives respectively.

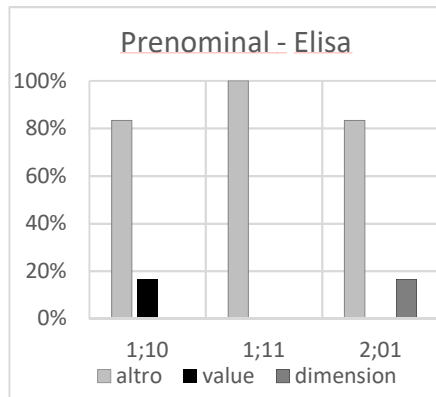


Figure 4.5 Prenominal adjectives - Elisa

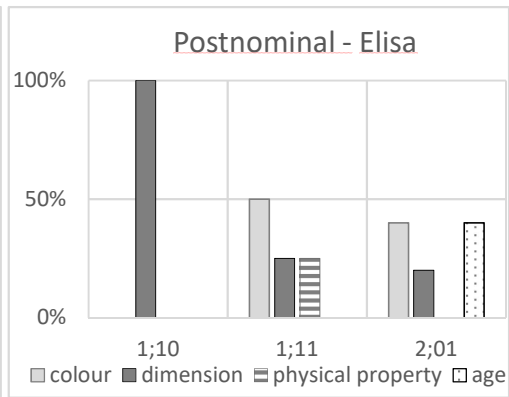


Figure 4.6 Postnominal adjectives - Elisa

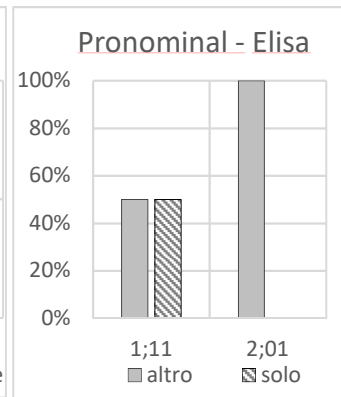


Figure 4.7 Pronominal adjectives - Elisa

As said above, the prenominal position is mainly taken by *altro*, which is very high in the functional structure, merged above numerals. As noticed by Cardinaletti & Giusti (2010), the fact that this adjective is realised and co-occurs with the determiner means that the structure is already built and operative (cfr. examples in (2) above). At age 1;10 we also find a prenominal *bello* 'nice' in the target reduced form *bel* (*è un bel* (.) *ponte* 'it is a nice bridge', see (1) above) and at age 2;01 we find one prenominal size adjective (*grande* 'big', see (3)). This size adjective does not seem to have a value interpretation, but it likely refers only to the size of the box. This contrasts with Cardinaletti & Giusti (2010), who found only one size adjective used prenominally in their corpus and interpreted it evaluatively.

- (3) guarda (.) sì c'è là la grande cassetta (.) guarda la grande cassetta. (Elisa 2;01.06)
 look . yes there is there the big box . look the big box
 'look, yes, there is the big box there, look at the big box'

At age 1;10, we only find one postnominal adjective, again a size one: (*è una gallina piccolina* (.) *hai capito ? [+R]*, as a repetition). At 1;11 and 2;01 Elisa produces more postnominal adjectives from more classes (colour, dimension, physical property). Notice that the fact that at 1;10 Elisa produces descriptive adjectives both in prenominal and in postnominal position means that, at this age, both are already available to her. All adjectives appear in a position that is consistent with the adult language, i.e., there is no adjective misplaced in prenominal or postnominal position.

Elisa does not produce any adjectives in pronominal structures, aside from the two pre-cardinal ones (*altro* and *solo*).

As regards the relation between adnominal adjectives and the syntax of the DP, all utterances are target-like with respect to adjective positioning and lexicalisation of the determiner. As can be seen in the examples above, prenominal and postnominal adjectives occur both with definite and indefinite determiners, and in one case, a postnominal adjective co-occurs with a demonstrative.

- (4) ma mi dai quel piattino viola ? (Elisa 2;01.20)
 but to-me.CL give that plate-DIM purple
 'will you give me that purple saucer?'

Adnominal adjectives mainly modify a count singular noun (NCS = 21); only 5 modify a plural noun. Plural modified DPs appear at 1;11. In both cases, the determiner is lexicalised, and number and gender agreement are always correct on the adjective and the determiner. Singular nouns are modified both by pre-and postnominal adjectives, whereas plural nouns are only modified by postnominal adjectives (as in (5)a) or by *altro* (as in (5)b).

- (5) a. le calzine nuove , vero Mina ? (Elisa 2;01.22)
 the socks new right Mina
 'the new socks, right Mina?
 b. le a(l)tre tazzine dove +... (Elisa 2;01.20)
 the other cups-DIM where ...
 'where (are) the other cups?'

Many nouns in Elisa's speech are modified by evaluative or diminutive suffixes, as examples in (6) show. When this happens, however, the determiner is always lexicalised. This is yet another clue to the fact that the DP is active; as seen in chapter 2, section 2.4.2, a noun modified by a diminutive suffix often constitutes a context for article omission (Belletti & Guasti, 2015; Gallina, 2018).

- (6) a. e un altro coniglietto dov' è ? (Elisa 1;10.04)
 and an other rabbit-DIM where is
 'and where is another rabbit?'
 b. &l le sca(r)pine (.) verde &o (.) blé . (Elisa 1;11.19)
 the shoes-DIM green or blue
 c. guarda c'è anche l' altra gonnellina ? (Elisa 2;01.23)
 look there is also the other skirt-DIM
 'look, is there the other little skirt too?'

Adjectivally modified DPs are mostly predicative (N=12) and argumental (N=7). There are also 9 DPs in isolation. When they are arguments, they are always direct objects (as in (4) above); only one is

an adverbial DP (7). More rarely are they the complement of a preposition (see (2) above). In general, in almost all cases, the DP is lexically governed.

- (7) un(a) altra volta arriva il cagnolino (Elisa 1;10.18)
 an other time arrives the dog-DIM
 'another time the little dog arrives'

I turn now to the analysis of predicative adjectives. Adjectives in predicative position are the majority in Elisa's speech. They always occur with the copula *essere*, always with correct number agreement between copula and adjective (8). Sometimes both members of the predication are lexicalised, as in (9).

- (8) a. è malato ? (Elisa 1;10.18)
 is sick
 'Is he sick?'
 b. è bava [: brava] . (Elisa 1;11.19)
 is good
 'she's good'
- (9) a. ah (.) il caffè è pronto . (Elisa 1;10.18)
 ah the coffee is ready
 b. è uguale la mamma . (Elisa 1;11.04)
 is alike the mum
 'the mum is alike'

Adjectives in predicative position show an increase over age. This correlates with an increase in past participles, which are all used in predicative position (except one in isolation), as in (10).

- (10) a. no che non è bagnato . (Elisa 1;11.04)
 no that not is wet
 'no, it isn't wet'
 b. ma guarda è tutto b(r)uciato [: bruciato] ! (Elisa 2;01.06)
 but look is all burnt
 'look, it's all burnt!'
 c. guarda è tutto rovinato . (Elisa 2;01.23)
 look is all ruined
 'look, it's all ruined'

This fact is significant. For their semantics and the context in which they are used, these participles receive a stage-level interpretation. Interestingly, none of the adjectives that appear in adnominal position seem to receive a stage-level/restrictive interpretation, although it is not possible to directly exclude it, as the adjectives that appear adnominally might all be used for both sources of

modification. However, in all the relevant contexts the non-restrictive reading seems the most plausible one.

How may this fact be interpreted? A tentative answer might be that Elisa is at a stage in which she has not yet acquired the reduced relative clause source for adjectives. This would be in line with the prediction that indirect modification implies the possibility for adjectives to be used in predicative position. Possible evidence comes from the examples in (11). Here, the participial adjective modifies the noun through a full relative clause in a context in which the adult language would use a reduced one.

- (11) a. *i bimbi che sono bagnati .* (Elisa 1;11.19)
 the children that are wet
 ‘the children who are wet = the wet children’
- b. *le calze che sono rotte .* (Elisa 2;01.22)
 the socks that are broken
 ‘the socks that are broken = the broken socks’

Why should children prefer a full relative instead of a reduced one? The reason is not clear, but a confirmation for this fact might be found in Contemori & Belletti (2014), who conducted an experimental study on the production of Object Relatives (OR). They found that the difficulty that children and adults have with ORs is avoided through the production of Passive ORs (POR), the more so as age increases (adult controls produced 92% of PORs). Table 4.1 shows the different types of PORs across age group. The results clearly show that reduced relatives are produced less than copular relatives by children, whereas adults produce them at a comparable rate.

Types of Passives	Task 1 and 2							Task 3					
	3;4- 3;11	4- 4;11	5- 5;11	6- 6;11	7- 7;11	8- 8;10	Adults	3;4- 3;11	4- 4;11	5- 5;11	6- 6;11	7- 7;11	8- 8;10
“Si fa” / causative	—	1.9	4.6	8.5	0.3	8.8	—	0.4	3.2	16.8	20.4	8.75	40.4
Copular	—	—	5.1	3.5	0.3	34.6	48	—	—	4	6.9	10.8	31.5
Reduced	—	—	1.6	1	5.1	2.9	42	—	—	—	0.4	7.5	0.9

Table 4.1 Percentages of passive object relatives produced by children and adults in Elicitation Task 1 [...] and Elicitation Task 2 [...]. (Contemori & Belletti, 2014, p. 1034, Table 5), and by children in Elicitation Task 3 [...] (Contemori & Belletti, 2014, p. 1035, Table 6).

The data above refer to verbal passives, whereas the focus of this analysis is on adjectival copular relatives. However, a parallel might be drawn in the earlier availability of full relatives. If this is the case, the mechanisms involved in the reduction would be acquired later than the syntax of relatives.

4.1.2 GREGORIO

Semantic acquisition

Gregorio's data show an early stage, both in his general linguistic production and in the production of adjectives. His recordings start at age 1;07, when he is turning from the one-word to the two-word stage, and stop at age 2;00. Therefore, his data are interesting in showing an opposite endpoint to Elisa's production.

Figure 4.8 and Figure 4.9 show Gregorio's development in the production of semantic classes.

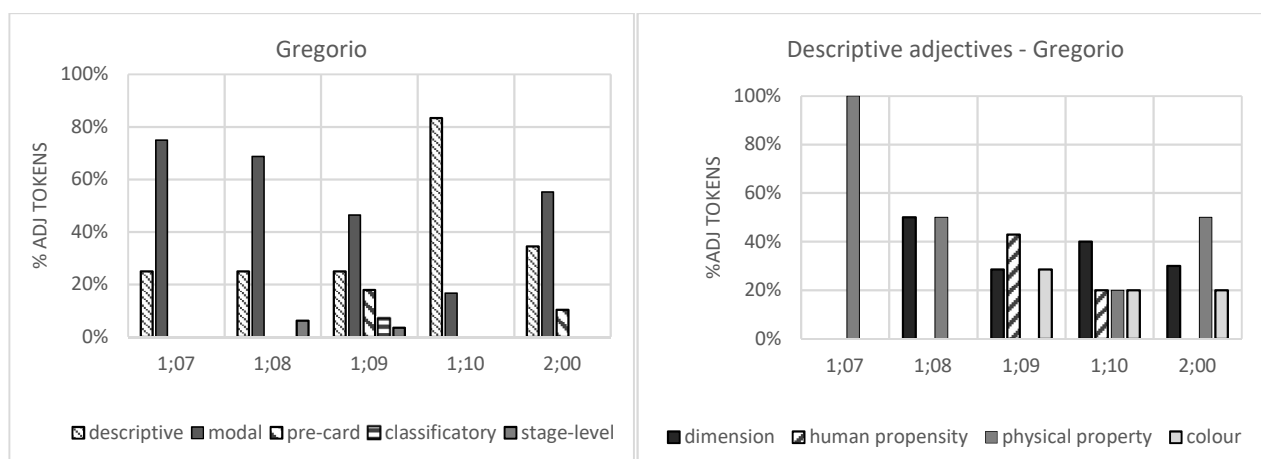


Figure 4.8 Semantic groups across age in the speech of Gregorio

Figure 4.9 Descriptive adjectives across age in the speech of Gregorio

He already produces some adjectives in the first recordings (1;07-1;08). At 1;07, he only produces four tokens (3 types): the evaluative adjectives *buono* 'good' and *brutto* 'ugly' and the physical property one *sporco* 'dirty'. At age 1;08, there are more tokens (16) and types (5 new types), but the real vocabulary increase and diversification occurs at age 1;09, when 10 new types from six semantic classes are added to his productive vocabulary. Noticeably, at the same age Gregorio starts also producing adnominal adjectives, as will be shown below.

Gregorio does not seem to confirm Tribushinina et al.'s (2015) prediction that adjectives are acquired in antonymic pairs. Table A.6 in the Appendix shows that adjectives belonging to the same antonymic pair are first produced at different ages. However, given the scarcity of data, it is possible that this is due to a sampling effect. In any case, the semantic class seems to play a role. Two value adjectives appear together at 1;07, two dimension ones at age 1;08, again three value and two colour ones at 1;09.

Gregorio's most frequent semantic class is value; it includes 53% (N=44) of his total tokens and 29% (N=7) of his total types. As mentioned, a fourth of his total production consists of the lexical item *bello* 'nice, beautiful'. A note on Gregorio's colour adjectives is appropriate. They do not constitute a relevant part in Gregorio's production, with 5 tokens and three types: *bianco* 'white', *nero* 'black' and *rosso* 'red'. It is worth noticing that these adjectives are the first in the colour hierarchy proposed by Berlin & Kay (1969), as cited by Dixon (1982, p. 23). Berlin & Kay have proposed that there is a universal hierarchy of colour terms, such that if a language only has two colour terms, these will be *black* and *white*, if it has only three; the third will be *red*, the fourth and fifth will be *green* and *yellow* and so on. Not only does this hierarchy hold cross-linguistically, but it also determines some language-specific patterns (e.g., only the first three adjectives take the inchoative/causative derivation in *-en* in English: *blacken*, *whiten* and *red*, as opposed to **yellowen* or **pinken*). The fact that we see a relevance of this hierarchy also in the individual acquisition of one child might be a further validation of its underlying validity, pointing to the basic psychological mechanisms involved in the perception of colour and its linguistic encoding.

Syntactic acquisition

Figure 4.10 and Figure 4.11 show Gregorio's development over age in the syntactic production of adjectives. Contrary to Elisa, we see the earliest development in his production.

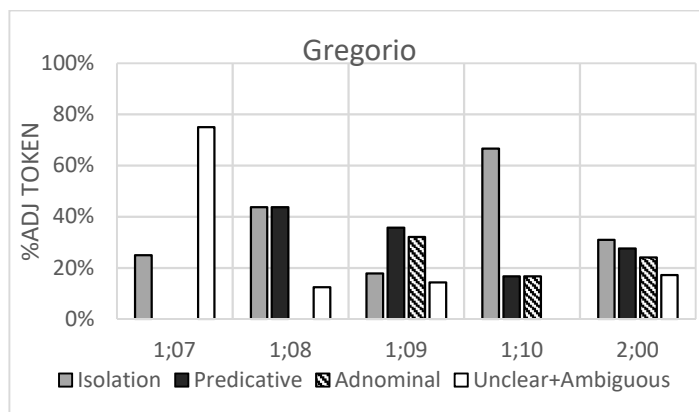


Figure 4.10 Adjective position across age in Gregorio's speech

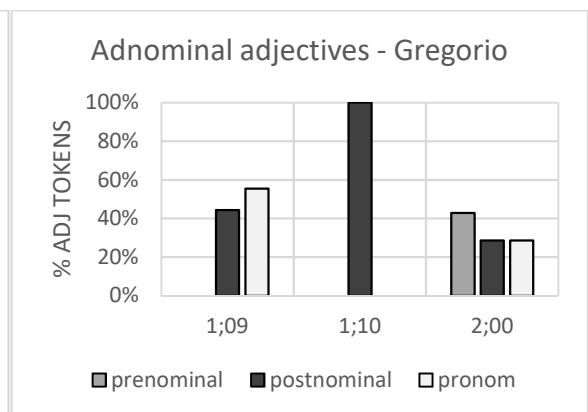


Figure 4.11 Adnominal adjectives across age in Gregorio's speech

At first (age 1;07) Gregorio only produces adjectives in isolation (N=1) or in unclear or ambiguous contexts (N=3, 2 ambiguous). (12) shows an example of an ambiguous N A combination, where the omitted element might be, in principle, either the copula of a predicative structure or the determiner of the adjectivally modified nominal DP. However, in both cases the context and the utterance itself favour a predicative reading.

- (12) a. cappe [: scarpe] bute [: brutte] . (Gregorio 1;07.17)
 shoes ugly
 b. = 'the shoes are ugly', or 'the ugly shoes'

The copula starts being lexicalised at age 1;08; throughout the recordings, when the adjective is in predicative position, it is always with third person singular copula è 'is'. The adjective always shows coherent gender marking (see (13)). The adjective is the only member of the predication present (we never find *N is A*). Although unambiguous cases are not present in the data, it is probable that at least some of the ambiguous *N + A* combinations mentioned above are predicates. If this is the case, when both elements are expressed, the copula is absent, as in (14).

- (13) a. MOT: com' è il biscotto ? (Gregorio 1;08.22)
 'how is the biscuit?'
 CHI: è b(u)ono !
 is good-MASC.SG 'it is good'
- b. MOT: com' è la Rita ? (Gregorio 1;08.22)
 'how is Rita?'
 CHI: è bella .
 is nice-FEM.SG 'she is nice'
- (14) pocco [: sporco] (gat)tino . (= è sporco il gattino 'the cat is dirty' ?) (Gregorio 1;07.17)
 dirty cat.DIM

Gregorio starts producing adnominal adjectives at age 1;09.24. As seen above, at this age there is a relevant expansion in Gregorio's adjective vocabulary. At first, he only produces postnominal (N=4) and pronominal (N=5) adjectives; prenominal ones appear at age 2;00. Gregorio's recordings stop at this age, and thus it is not possible to observe the subsequent development.

I turn now to the syntax-semantics mapping. Figure 4.12, Figure 4.13 and Figure 4.14 show the distribution of semantic classes across adnominal position in Gregorio's speech.

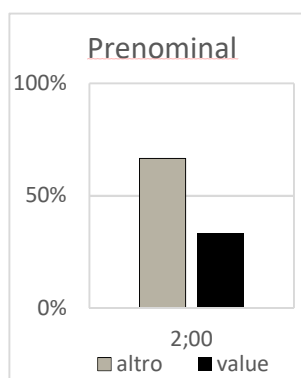


Figure 4.12 Prenominal adjectives - Gregorio

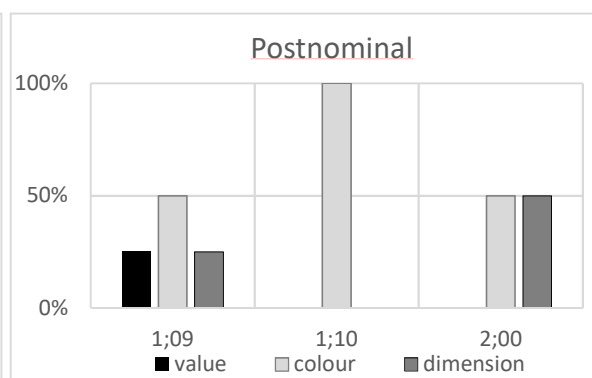


Figure 4.13 Postnominal adjectives - Gregorio

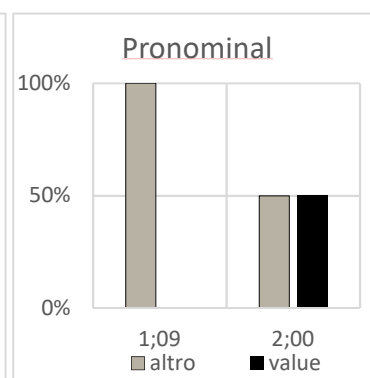


Figure 4.14 Pronominal adjectives - Gregorio

He produces only four classes of adjectives in adnominal position: *altro*, value, colour and dimension. We will see that these categories are also the first ones produced by Marco in adnominal position. Dimension and colour appear only postnominally, whereas value adjectives appear in both positions and in a pronominal DP. Specifically, of 7 value types produced by Gregorio, only *bello* is used as an adnominal modifier, in all three positions. As regards colour and size adjectives, we find also that the types produced are, intuitively, core ones: *grande* and *grosso* ‘big’ for size and *nero* ‘black’ and *bianco* ‘white’ for colour (the first two members of the colour hierarchy).

At first, *altro* is used only pronominally (15)a, and later (at 2;00.10) also with an overt noun (15)b.

- (15) a. un a(l)tro . (Gregorio 1;09.24)
 an other
- b. un alt(r)o lib(r)o poi . (Gregorio 2;00.10)
 an other book then

Let us now consider the relationship between the adjective and the syntax of the DP. Following the research questions, is the determiner lexicalised when an adjective is present? Is there a determiner/adjective alternation instead? Gregorio shows interesting proof that the DP is already active when he starts producing adnominal adjectives. The majority of these appear with a determiner (N=11; 65%), but bare nouns are also present (N=6; 35%). The determiner is lexicalised already at 1;09 [...] *un (uc)cello nero* . ‘a bird black’, see (17)a below, therefore, we cannot claim that at first the determiner is in complementary distribution with the adjective.

However, bare nouns are present. What is their distribution? Three are grammatical in the target language and three are not. An example of a target-like bare noun is in (16)a, where the phrase is in exclamative position. Another example, more revealing for the discussion on the acquisition of the DP, is the one in (16)b, where the adjective is postnominal after a proper name, without a lexicalised determiner. This corresponds to the Italian distribution described by Longobardi (1994) (cfr. Chapter 1, p. 37). The example provides important evidence that the noun rose to D; it is even more evident because *bello* is usually prenominal but appears postnominally here. This is clear evidence that the DP is active for Gregorio at this age.

- (16) a. che naso g(r)os(s)o . (Gregorio 1;09.24)
 how nose big
 ‘what a big nose’

- b. questo è Pegaso bello . (Gregorio 1;09.24)
 this is Pegaso beautiful
 'this is beautiful Pegasus'

As for DPs in argumental position, we find two specular cases. In (17)a, the DP is a postverbal subject; the indefinite determiner is realised. In (17)b the singular count noun is the object of the verb *guardare* 'to look'; a determiner is obligatory in this context. The DP appears first without the determiner; however, the definite article is produced after the verb. The DP might be fronted and partially resumed later (the two parts are separated by untranscribed material). This omission is consistent with Gallina's (2018) finding that fronted DPs occur articleless in early Italian. Finally, (17)c could be a case of preposition plus article omission (cfr. Belletti & Guasti, 2015). Note that in the previous utterance both article and preposition are realised. Belletti & Guasti (2015) attribute the high rate of omission in prepositional contexts to the difficulty of producing an articulated preposition; it might be that the addition of the adjective, increasing the overall complexity of the DP, led to the omission (cfr. Chapter 2, par. 2.5).

- (17) a. vola e poi già via un (uc)cello nero . (Gregorio 1;09.24)
 fly and then already away a bird black
 'a black bird flies away and is already gone (?)'
- b. topino bianco xxx guarda [: guarda] il +... (Gregorio 1;09.24)
 mouse-DIM white look the
 'look at the little white mouse'
- c. CHI: e(le)fante con la (pro)boscide . (Gregorio 2;00.10)
 elephant with the trunk
 CHI: sì (pro)boscide **grande** e beve [//] poi beve .
 yes trunk big and drinks then drinks
 'yes, big trunk, and it drinks, then it drinks'

Two further examples of article omission are found in DPs produced in isolation (18), therefore, no conclusion may be drawn on them. Notice that Belletti & Guasti report that omission rate is similar in isolation and in subject position, as opposed to object position, where the rate is lower.

- (18) a. dado (r)osso . (Gregorio 1;10.09)
 dice red
 'red dice'
- b. pane nero . (Gregorio 2;00.29)
 bread black
 'black bread'

At age 2;00.10, we find a production that is interesting on many respects (19). First, the child uses two cooccurring adjectives in a pronominal DP, *altro* and *bello* (19)a; their relative order is the correct one in Italian: *altro* is merged higher than all other adjectival modifiers. The form of *bello* is the full one, which is the target form in postnominal and pronominal position (see (16)b above). He successively expands on the utterance by adding the noun (19)b. The order of the adjective is unchanged, but Gregorio does not adapt the form of the adjective to the adult pronominal *bel* (as Elisa does instead, see (1) above).

- (19) a. CHI: c'è un altro (.) un altro bello . (Gregorio 2;00.10)
 there is an other . an other pretty
 'there is another pretty one' [...]
- b. CHI: un altro bello soddatino [: soldatini] .
 an other pretty soldier.little
 'another pretty toy soldier'

The most obvious reading is that this is a DM adjective and that Gregorio has not learnt the relevant derivation for *bel* yet. In Cardinaletti & Giusti's (2015) proposal, the declension of this particular form is given by a type of concord which is not the typical one for adjectives, which have their own gender and number flexion and are specifiers of a silent head. In the case of *bello*, instead, when the adjective is pronominal the root of the adjective is only *be-*, and the article-like declension is an overt specification of the head. Since *bello* is the only adjective behaving in this way in Italian, it is possible that Gregorio has not learnt this alternation.

There are, however, two further possible explanations. One is that *bello* is an IM adjective (which, being predicative, does not require the reduction to *bel*). In this case, the obligatory movement of the dP above the adjective would not have happened and the adjective would have remained pronominal. The second is that this is a pronominal *altro* followed by two reduced relative clauses (= *un altro che è bello che è soldatino* 'another one which is pretty which is a little toy soldier'). In this light, also *bello* in the first utterance (in the pronominal DP) would be more likely an IM adjective, as it would be in the target language.

As seen for Elisa, there is no independent hint that IM is available to Gregorio, therefore these two possibilities appear less likely. In any case, the production of these two utterances shows that at age 2;00 Gregorio can project a complex DP with a determiner, a noun and at least two functional layers hosting a modifier.

4.1.3 RAFFAELLO

Raffaello is a later speaker than the other children analysed. However, he is also recorded for a longer period of time (1;07-2;11), although not as regularly and frequently as Marco. His data allow some insightful observations.

Semantic acquisition

Figure 4.15 and Figure 4.16 show the development across age of Raffaello's production of semantic classes, in general and in detail for descriptive adjectives. As mentioned in chapter 3, his most frequent classes are value (N=77/226 tokens, 34%), dimension (N=59, 26%) and physical property (N=30, 13%).

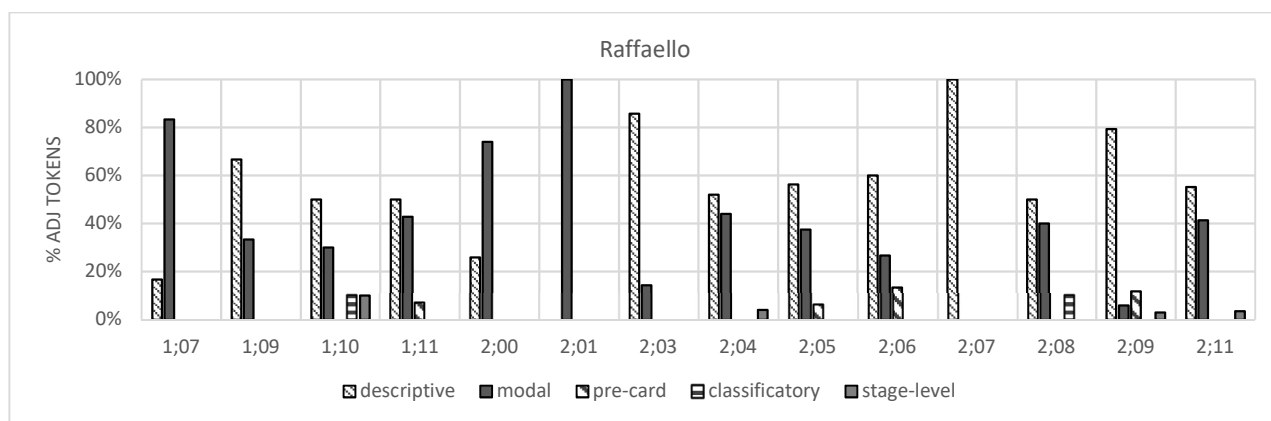


Figure 4.15 Semantic groups across age in the speech of Raffaello

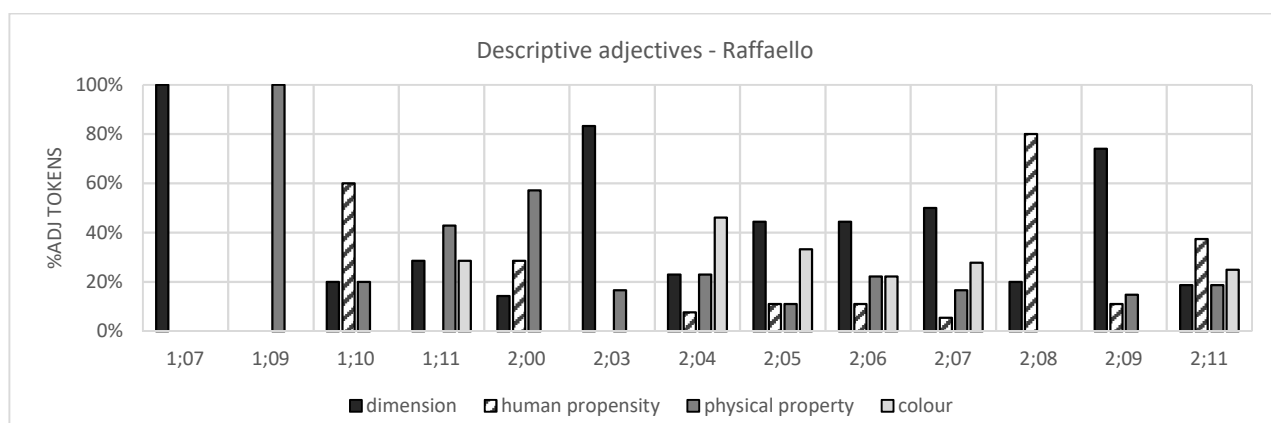


Figure 4.16 Descriptive adjectives across age in the speech of Elisa

At 1;07, Raffaello only produces 6 adjectives, 5 tokens of *bello* (value) and one token of *grande* (size). There are no recordings at 1;08; at 1;09 we find again only 6 adjectives, namely one token of *bello*, one of *brutto* 'ugly' and four of *duro* 'hard', in a repeated utterance. This suggests that, in these months, we observe the very first stage in Raffaello's adjective production, where he only utters a

few items, belonging to a few types. Note, however, that even at age 1;07 *bello* is present both in the singular and in the plural form (20).

- (20) a. bello . (Raffaello 1;07.07)
 pretty-MASC.SING
- b. belli ! (Raffaello 1;07.07)
 pretty-MASC.PLUR

As is evident in Table A.8 in the Appendix, Raffaello has a vocabulary spurt at age 1;10, when he produces 8 new types, and another one at 2;04; after this, his adjectival vocabulary keeps expanding. As a matter of fact, at 1;10 we only find 10 tokens, but of different types; a higher token frequency is found from 1;11 onwards. Among descriptive adjectives, Raffaello only produces four semantic classes (dimension, human propensity, physical property and colour). Many human propensity and physical property types are participles (*rotto* ‘broken’, *chiuso* ‘closed’, etc.). Some are overgeneralised participles (*rompato* for *rotto* ‘broken’).

Syntactic acquisition

I turn now to the analysis of syntactic development in Raffaello’s adjectives. Figure 4.17 and Figure 4.18 show this in general and in detail for adnominal adjectives.

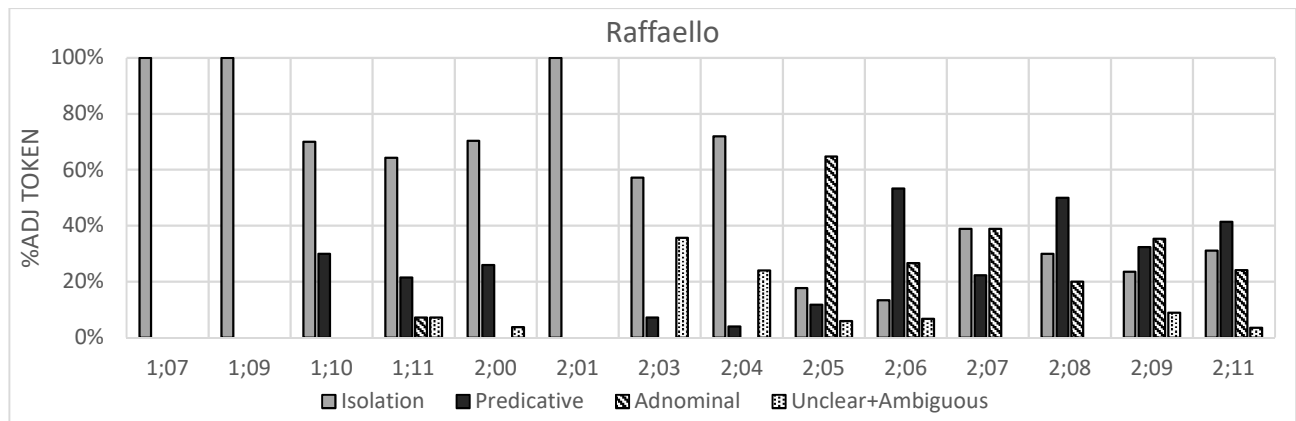


Figure 4.17 Adjective position across age in Raffaello’s speech

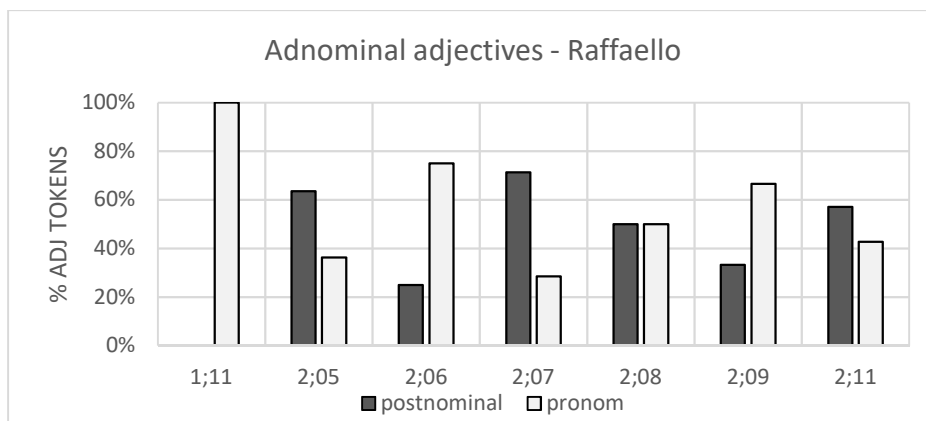


Figure 4.18 Adnominal adjectives across age in Raffaello's speech

In the first two recordings (1;07 and 1;09) adjectives are exclusively in isolation, in one-word utterances (the transcription's punctuation suggests that some are exclamative). As seen above, Raffaello, at this age, produces very few types and tokens. At 1;10 we find some adjectives in multiword utterances (exclamative/imperative as in (21) or predicative as in (22)⁴⁹).

(21) zitte (1.) macchine (.) pe@o pe@o . (Raffaello 1;10.20)
 quiet cars
 'cars, keep quiet!'

(22) [...] quetto u@p bello . (Raffaello 1;10.20)
 this pretty
 'this is pretty'

After this, for a long period, Raffaello only produces adjectives in isolation or in predicative position. There is only one exception regarding adnominal adjectives. At 1;11 Raffaello utters the sentence in (23), in which there is a pronominal occurrence of *altro* 'other'. Although this is likely a semi-fixed expression, the adjective shows correct feminine agreement with its referent. Apart from this example, Raffaello never produces an adjectivally-modified DP until age 2;05⁵⁰.

(23) [...] ecco un' attra (.) attra . (Raffaello 1;10.20)
 ecco an other
 'here is another'

⁴⁹ In this example, either the copula is missing, or its function is absolved by the vowel [u]. See below for discussion on monosyllabic placeholders.

⁵⁰ For this reason, unless specifically required, I will consider for convenience that adnominal modification starts at this age.

In this period, predicative adjectives show three patterns. Sometimes the adjective appears with a lexicalised copula, as in (24)a. In other cases, the adjective is preceded not by a copula in the proper form, but by a vocalic or monosyllabic segment, as in (24)b. As reported by Belletti & Guasti (2015), such monosyllabic placeholders substitute for functional elements like determiners and copulas. In this case, the adjective has been coded as in isolation, but often the context strongly suggests that the placeholder stands for a copula.

- (24) a. è duro . (Raffaello 1;11.00)
 is hard
 'it is hard'
- b. en@p duro . (Raffaello 1;11.00)
 MPH hard
 'it is hard'

Finally, in some situations both terms of the predication are lexicalised, either with an overt copula (25)a or with a covert one (25)b.

- (25) a. quetto è rosso . (Raffaello 1;11.00)
 this is red
- b. uh@i 0w brutto quetto (.) que 0w brutto . (Raffaello 2;00.10)
 uh ugly this . this ugly
 'this is ugly'

We find some similar cases that have been coded as ambiguous, although they are also probably predicative. Interestingly, some of them involve proper names. In both cases, there is probably a missing copula preceding the adjective.

- (26) a. Giovanni (3.) 0w cattivo . (Raffaello 2;04.29)
 Giovanni bad
- b. (.) 0w brutto Andrea . (Raffaello 2;04.29)
 ugly Andrea

Raffaello starts producing adnominal adjectives at age 2;05. They are equally shared between postnominal (N=22) and pronominal (N=22). However, he does not produce any pronominal adjectives, not even *altro*, which is consistently present in the production of the other children; in Raffaello's speech it does only appear pronominally. Figure 4.19 and Figure 4.20 show the semantic class to which postnominal and pronominal adjectives belong, with development across age.

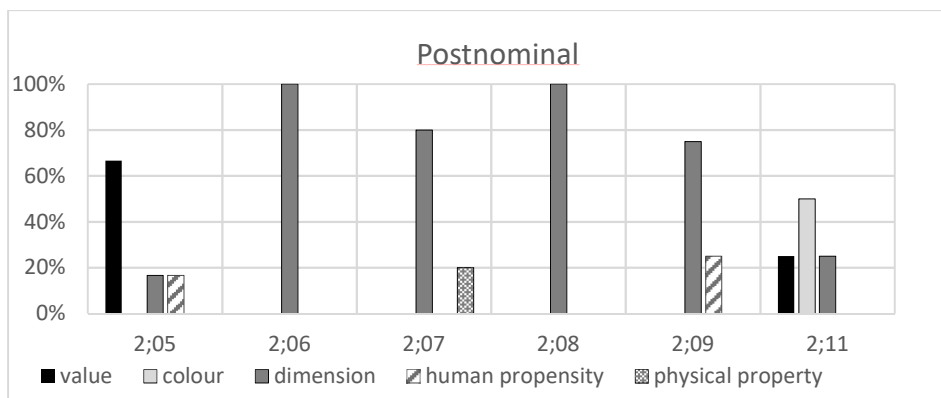


Figure 4.19 Postnominal adjectives - Raffaello

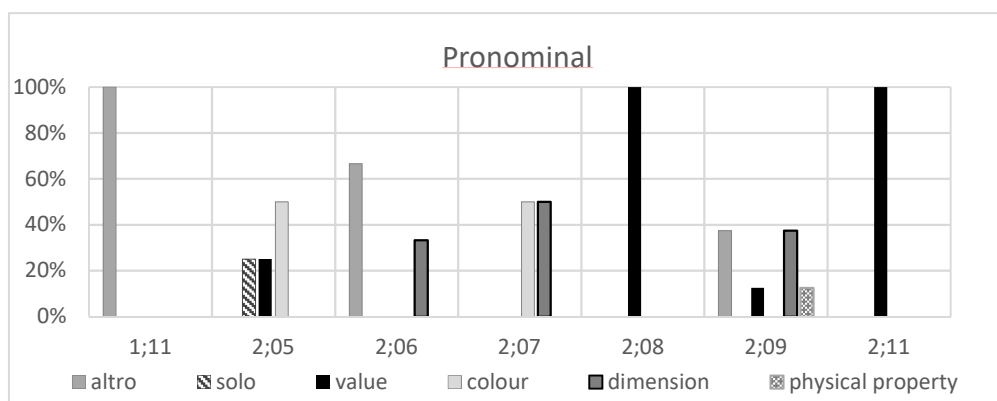


Figure 4.20 Pronominal adjectives - Raffaello

As can be seen, as soon as he starts producing adnominal adjectives (2;05), we find adjectives from three classes in postnominal position and from three classes in pronominal position.

The most frequent class in postnominal position is dimension (N=11, 50%). We have then 5 evaluative adjectives and one or two occurrences of other classes (colour, human, physical plus a novel adjective). However, the number of types that enter the postnominal position is not very high. We find the three core dimensional adjectives *grande*, *piccolo* and *grosso* with multiple occurrences and two instances of mono-dimensional ones: *alto* 'high' and *lungo* 'long'. The five tokens of the value class are all instances of *brutto* 'ugly, bad'; we do not find postnominal adjectives that are typically pronominal in other children's speech, such as *bello*. In sum, the only class that seems to have a relevance as such is dimension, whereas others seem to be more tied to single lexical items.

- (27) a. provo (.) quetto è un gatto piccino ? (Raffaello 2;07.00)
 this is a cat small
 'is this a little cat?'

- b. faccio una balena grossa xxx ! (Raffaello 2;07.00)
 make a whale big
 'I'll make a big whale'

Aside from pre-cardinals (*altro* and *solo*), pronominal adjectives belong mainly to the three classes of value, colour, dimension; there is also one physical property adjective.

The examples in (28) show the types of pronominalization that are found in Raffaello's speech; we find some of the constructions examined in chapter 1, section 1.6.2. (28)a shows an example of definite null nominal construction (cfr. p. 38), and (28)b,c of indefinite null nominal constructions.

- (28) a. quella bionda Ow chimava , chimava non me lo ricordo . (Raffaello 2;05.13)
 that blonde called called not CL CL remember
 'the blond one was called – I can't remember'
- b. ora te lo faccio una pió grossa . (Raffaello 2;09.06)
 now CL CL make one more big
 'now I'll make a bigger one for you'
- c. ora te lo faccio io una [/] una dolce buona eh ! (Raffaello 2;09.06)
 now CL CL make I one sweet good
 'now I'll make to you a good sweet one!'

Both display very well the characteristics of this structure. First, the adjective is clearly restrictive. In the first case it identifies a person with the characteristic of being blonde, in the second the child and the adults are drawing whales of various sizes and the child says that he will make a bigger whale than the previous one, using a comparative to distinguish it. Additionally, the demonstrative is not used deictically, but is the pronominalized element (it is translatable as 'the blonde one', not 'that blonde one', since the referent is not present).

Thus, it is probable that the two null nominal constructions correspond to the adult ones. As the adjectives in these constructions are indirect modification ones, their availability implies that the reduced relative clause source is available to Raffaello at this stage. This is an important finding, because we do not have any other hint at the fact that postnominal adjectives might be IM ones (although, again, this cannot be entirely excluded given the ambiguity of the adjectives used).

Example (28)c shows a multiple occurrence of adjectives (the only one in Raffaello). If these were DM adjectives, the order would be the correct one in Italian, with the physical property term closer to the noun than the evaluative one. However, this structure parallels the one in (28)b, and therefore is more likely to have two IM adjectives, showing that the derivation of reduced relatives is recursive.

To summarize Raffaello's acquisition of adnominal adjectives, we find that adnominal modification emerges quite late in his speech compared to the other children; when it appears, however, it shows a variety of structures. Both pronominal and postnominal adjectives appear at age 2;05; at the same age, pronominal constructions with IM adjectives are produced.

How do adnominal adjectives relate to the DP they modify? Are determiners lexicalised? As mentioned in chapter 3, Raffaello only modifies count nouns, both singular (N=19) and plural (N=3). The determiner is almost always lexicalised; it is always a definite or an indefinite article.

- (29) a. faccio una balena grossa xxx ! (Raffaello 2;07.00)
do a whale big
'I'll make a big whale'
- b. ecco eccolo , qui questa è la balena grossa . (Raffaello 2;09.06)
there here this is the whale big
'there, here, this is the big whale'
- c. con [/] con i mulini bianchi , come questo vedi , vedi ? (Raffaello 2;11.20)
with the mills white like this see
'with the white mills, like this one, see?'

We find a very low number of bare nominals (N=4), which are reported in (30). Are they licit in the target grammar? Is there any clue that the omission might be due to the adjective? (30)a might not be a bare noun, because it is preceded by a vocalic element [a] which might be a placeholder for an article. (30)b is a completion of his mother's utterance. (30)c is the complement of a preposition, which, as seen, is a context that is prone to article omission independently from the presence of the adjective.

- (30) a. la foce [!] 0w va a@p draghetti grossi grossi . (Raffaello 2;05.13)
the estuary go dragons-DIM big big
'to the estuary, very big little dragons go'
- b. ++ draghetti sughi@n . (Raffaello 2;05.13)
dragons-DIM *sughi*
- c. e@p 0w con 0w bici grande . (Raffaello 2;06.13)
with bike big
'with the/a big bike'
- d. prendo 0w foio pulito eh ! (Raffaello 2;07.00)
take sheet clean
'I'll take a clean sheet of paper'

(30)d, instead, is a direct object singular count noun; therefore, the omission is ungrammatical in Italian. However, this is the only case in which this happen; in similar contexts the article is

lexicalised (see (29)a above). Belletti & Guasti (2015) report that, although less frequent than in subject position or in isolation, articles are omitted also when the DP is in object position. Therefore, there does not seem to be article omission due to the presence of the adjective in Raffaello’s speech, although the increased complexity caused by the adjective might favour it.

As concerns the type of noun, Raffaello only modifies count nouns, singular and plural. The latter are only three cases.

4.1.4 MARCO

Marco’s data is the most abundant; as reported, his recordings cover a year of his life (1;5-2;5). He was recorded every two weeks and the transcriptions last 45 minutes. For this reason, this corpus allows a more refined analysis and to draw more solid conclusions, which can be compared with the other children’s results.

Semantic acquisition

Marco’s transcriptions start when the child is at the one-word stage. At this stage we already find adjectives produced. Development of semantic classes production across age and of descriptive adjectives in particular are shown in Figure 4.21 and Figure 4.22 respectively.

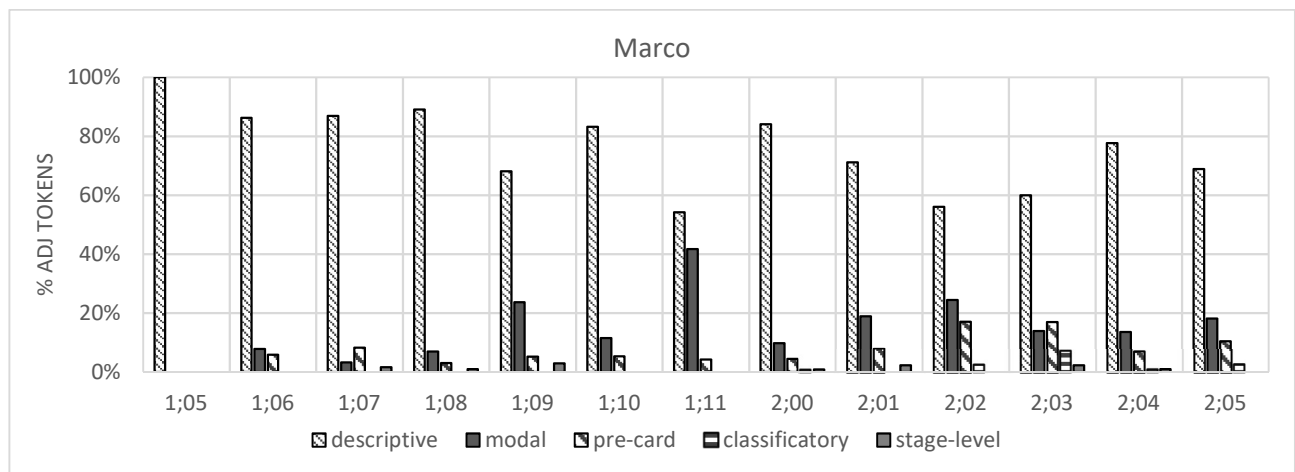


Figure 4.21 Semantic groups across age in the speech of Marco

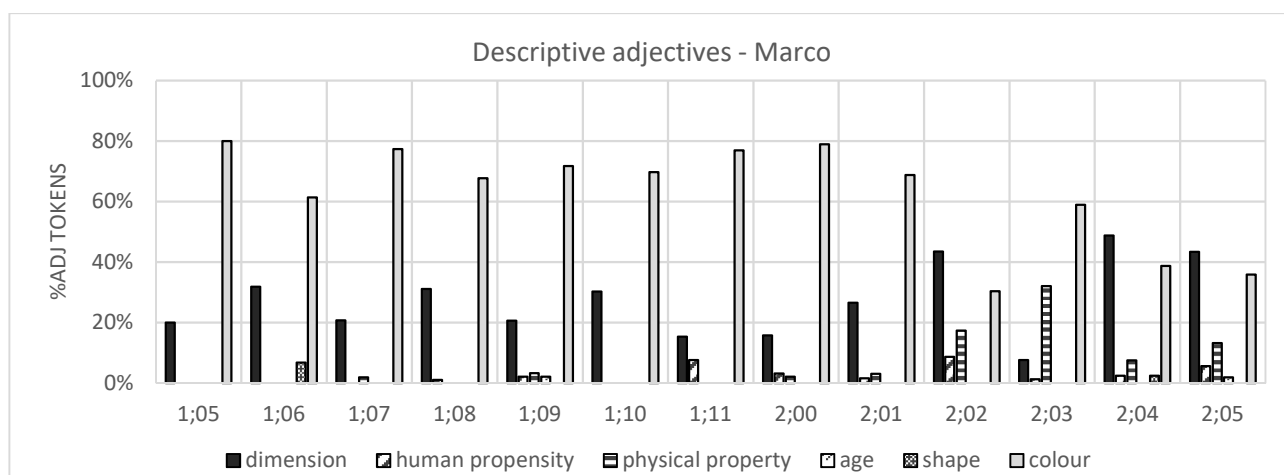


Figure 4.22 Descriptive adjectives across age in the speech of Marco

As mentioned in chapter 3, there is a high dominance of colour adjectives in Marco's speech (49% of his total token production), followed by dimension (21%) and value (12%). These three classes represent 82% of his token production. Development over time shows that Marco's production starts with only colour adjectives: in the first recording (at 1;05.04), the only adjective used productively is *rosso*, 'red' (17 tokens). It is often (but not exclusively) used to designate a specific referent, a 'red ball' (*la palla rossa*) and to express a request for it, as shown in (31). There are also two tokens of *verde* 'green' and *blu* 'blue', both as repetition of the mother's utterance; he does not seem to map the word to the correct colour. Conversely, he correctly identifies a cube as red (32). This example suggests that it is not the case that Marco has learnt *rossa* as a noun for the ball, because he can use the adjective in the masculine form when asked for the colour of an object.

- (31) MAR: (r)ossa [/] (r)ossa . (Marco 1;05.04)
 'Red'
 MOT: la pallina rossa ?
 MOT: è andata sotto (i)l tavolo .
 'The red ball? It went under the table'
- (32) MAR: oio [: rosso] . (Marco 1;05.04)
 'Red'
 MOT: questo è rosso bravo molto bene .
 'This one is red, good boy, well done'

Other categories appear gradually: first dimension adjectives (already in the second recording, 1;05.18), and later value, shape and pre-cardinal (1;06); stage-level and physical property adjectives appear at 1;07. Value and dimension adjectives appear as antonymic pairs: *grande* and *piccolo* together at 1;05, *bello* and *brutto* both at 1;06; additionally, colour terms seem to be grouped as

members of a contrasting set. This is consistent with the semantic hypothesis proposed by Tribushinina et al. (2015) and confirmed by Noccetti (2015) specifically for Italian. Besides, it confirms that adjectival terms are assigned to a class before their meaning is fully acquired.

These results suggest that, although Marco is still learning adjectives in a lexically-based fashion, he is already starting to group them together, in a way that is consistent with lexical-semantic classes. As we will see, his most frequent classes will also have a relevance in the acquisition of syntactic constructions.

Syntactic acquisition

In this subsection, I will analyse how Marco acquires the syntax of adjectives. Development of syntactic functions is shown in Figure 4.23.

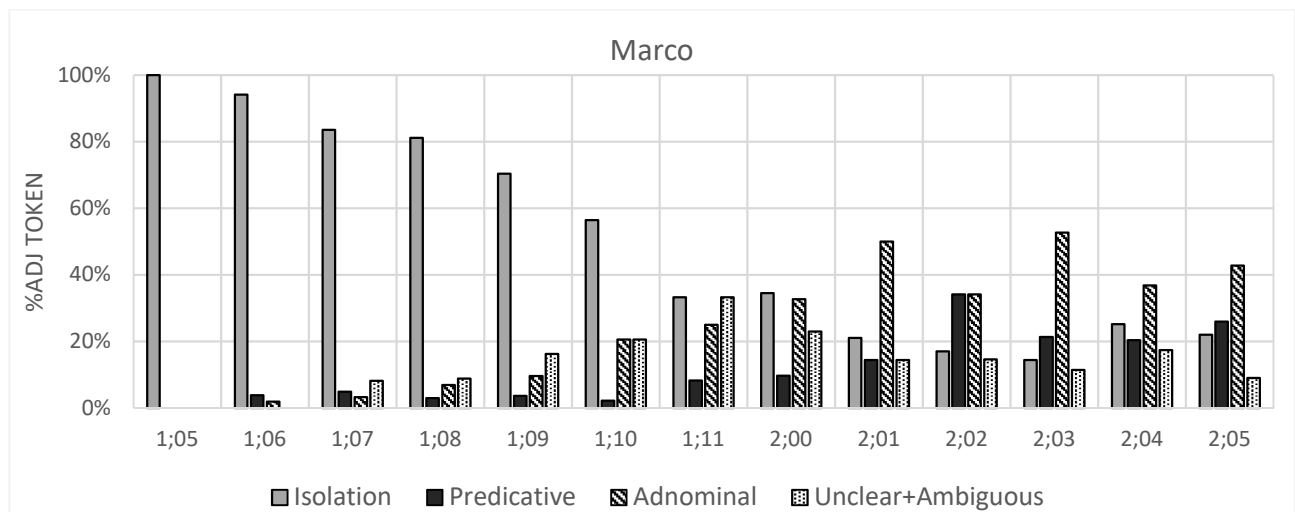


Figure 4.23 Adjective position across age in Marco's speech

His first adjectives are produced in isolation (they could be also predicative or used to identify a unique referent, see the example of the *red ball* above). At age 1;06 he starts producing adjectives in overt predicative position, i.e. he starts lexicalising the copula. Still, the high proportion of adjectives in isolation probably corresponds to predicative ones. The production of adnominal adjectives starts at 1;08. Once they appear, adnominal adjectives outnumber predicative ones; they progressively increase and after age 2;00 the majority of adjectives is adnominal. In what follows, I will first analyse predicative adjectives, and then I will turn to adnominal ones.

PREDICATIVE ADJECTIVES Predicative adjectives mainly occur with a third person singular copula. In the only plural case at age 1;06, (33)b, the copula is third person singular, thus there is no number agreement between the adjective and the null subject of the sentence. At 1;11, however, Marco

shows correct second person singular agreement. In the first months, when the adjective is predicative, the other member of the predication is never present; it starts to be sometimes lexicalised from age 2;01 (see (34)). Example (35) shows that adjectives are used as predicates not only in postcopular position, but also in other constructions. In this case, the adjective is in a small clause.

- (33) a. è bu [: blu] . [+ R] (Marco 1;06.22)
 is blue
 'it is blue'
- b. MOT: come sono le <fragoline> [>] ? (Marco 1;06.22)
 'how are the strawberries?'
 CHI: è grandi [<] .
 is big.PL 'they are big'
- c. sei brutto tu . (Marco 1;11.16)
 are ugly you
 'you're ugly/bad'
- (34) a. que(s)ti [//] que(s)to è giusto . [+ r] (Marco 2;01.11)
 this is right
- b. guarda , è rotto que(s)to pezzo ! [+ r] (Marco 2;01.11)
 look is broken this piece
 'look, this piece is broken'
- (35) penna [/] penna pedo [: prendo] grande . (Marco 1;10.12)
 pen take big
 'The pen, I take it big'

ADNOMINAL ADJECTIVES Figure 4.24 shows the development of adnominal adjectives. The first instances of adjective in a DP in the speech of Marco are found at age 1;06/7, but they are three occurrences of *solo* 'only', used as a focaliser of the pronominal *uno*. Although they show feminine infection, all the three occurrences are feminine. Thus, this might be an unanalysed form or a fixed expression.

- (36) una ola [//] sola [>] . (Marco 1;06.22)
 one only
 'only one'
- (37) (Marco and his mother are playing with cards) (Marco 1;07.06)
 MAR: ai una sola .
 have one only
 'you have only one'

The first adjectives appearing in a DP with a lexicalised noun only come two months later, at 1;08. I will consider this to be Marco's age of first production for adnominal adjectives.

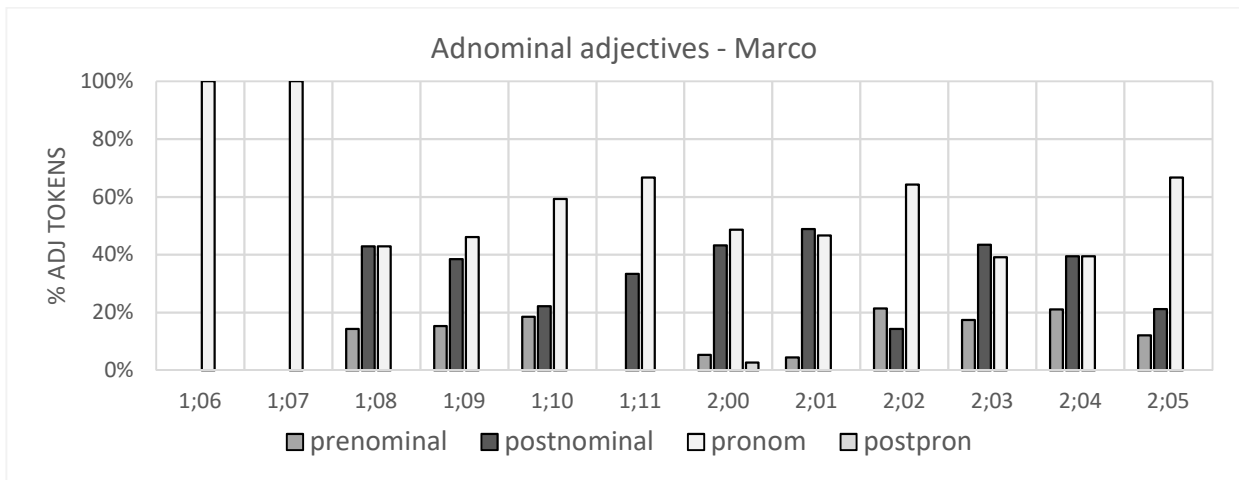


Figure 4.24 Adnominal adjectives across age in Marco's speech

Figure 4.24 shows that prenominal and postnominal adjectives appear together; additionally, also pronominal (non pre-cardinal) adjectives start being produced at this age. Adjectives in a pronominal construction are very frequent; in many cases more than postnominal ones, in other cases they are almost as much.

With reference to the syntax-semantics mapping, what adjectives are used adnominally by Marco? Is there an effect of semantic class? The answer to these questions is shown in Figure 4.25, Figure 4.26 and Figure 4.27 for prenominal, postnominal and pronominal adjectives respectively.

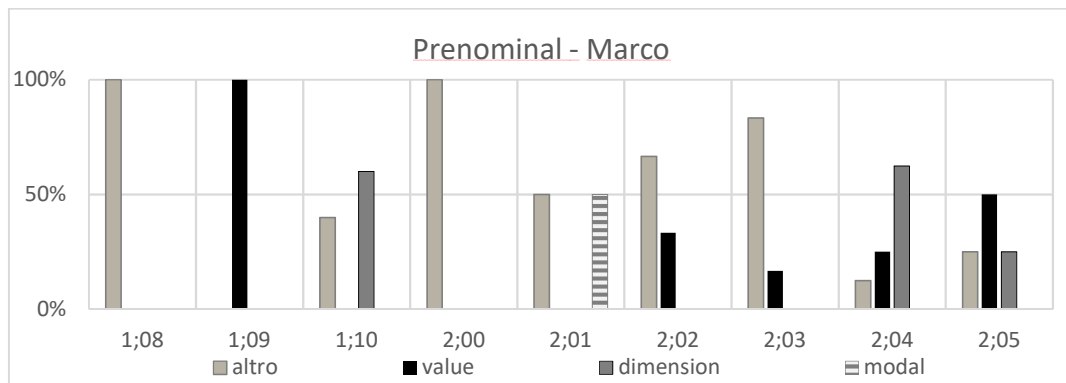


Figure 4.25 Prenominal adjectives - Marco

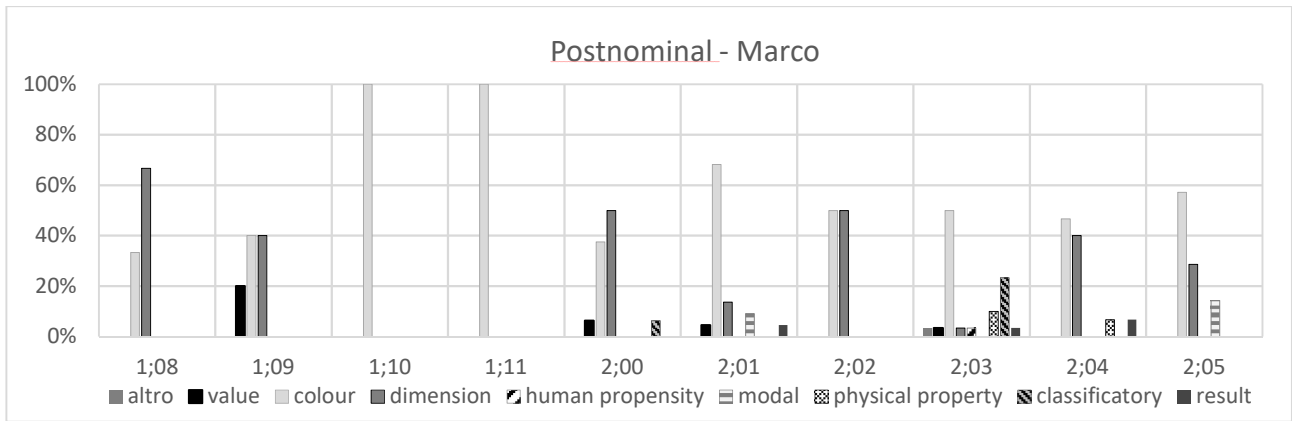


Figure 4.26 Postnominal adjectives - Marco

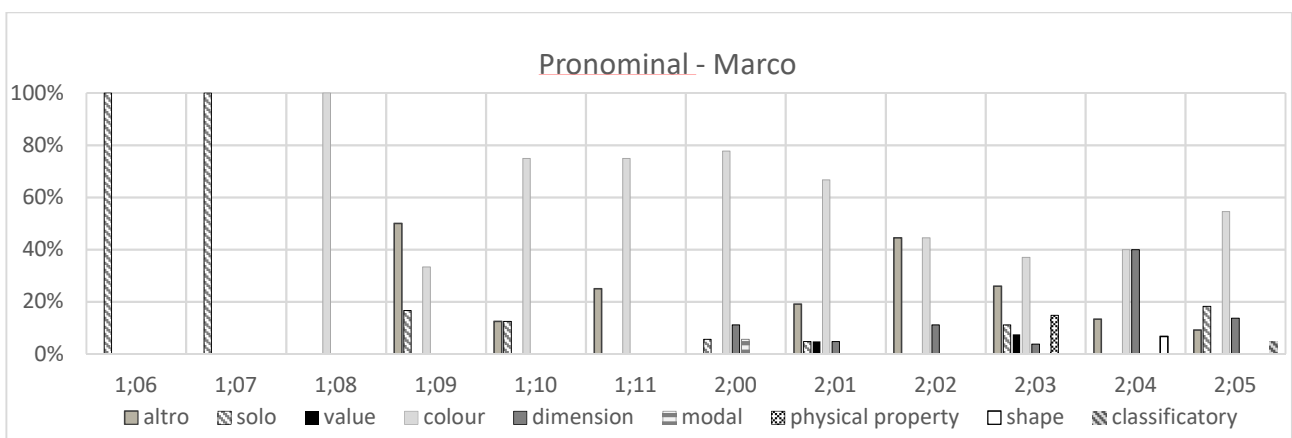


Figure 4.27 Pronominal adjectives - Marco

At 1;08, at their first appearance, adnominal adjectives consist of two tokens of size (as in (38)a) and one token of colour (as in (38)b) which are postnominal; one token of *altro*, pronominal (39), and some pronominal colour adjectives (40). Thus, at first, descriptive adjectives are only produced postnominally; the pronominal position is only realised by the pre-cardinal. At 1;09, instead, also value adjectives appear in adnominal position, pre- and postnominally.

(38) a. eh l' oca grande . [+ r] (Marco 1;08.03)
 eh the goose big
 'eh, the big goose'

b. pallina verde . (Marco 1;08.17)
 ball-DIM green

(39) un' altra badierina [: bandierina] . [+ r] (Marco 1;08.17)
 an other flag-DIM
 'another flag'

(40) <quattro gialli> [/] quattro gialli . [+ R] (Marco 1;08.17)
 four yellow

Few types are used in prenominal position. Among dimension adjectives, we only see the core size ones (*grande, grosso, piccolo*). Value adjectives are the core ones (*brutto* ‘ugly’, *bello* ‘pretty, beautiful’, *buono* ‘good’), plus *dolce* ‘sweet’ used evaluatively and the modal *vero* ‘real’. These are all target in their distribution; for instance, the adjective *dolce* ‘sweet’, used as an evaluative, is correctly placed prenominally, consistently with the adult language.

According to Cardinaletti & Giusti (2010), size adjectives, when prenominal, have an evaluative reading. This does not seem to fit our data: if example (41)a may be interpreted evaluatively, (41)b is more consistent with a size reading.

- (41) a. piccolo palcino [: pulcino] &cino . (Marco 1;10.12)
 little chick
- b. una grossa formiconna . [+ r] (Marco 2;04.26)
 a big ant.AUGM

Until 2;00, only colour, dimension and value adjectives appear postnominally (with the mentioned exception of an idiomatically combined adjective). *Dimension* are not limited to *size*, but include also the *length* adjective *lungo* ‘long’. At 2;01 also one result adjective is used (which will be analysed below) and at 2;02 again only colour and dimension. From 2;03 onwards, he uses a variety of classes, with different types of few tokens each.

A similar pattern is found for pronominal adjectives. Until age 1;11, only two classes of adjectives are used pronominally, pre-cardinal and colour. Pronominal constructions involving *solo* and *altro*, (like *uno solo* ‘only one’ and *un’altro* ‘another one’) are very frequent in the adult language. The only class of descriptive adjectives used pronominally at this stage is colour adjectives. From 2;00, also dimension and modal ones appear and from 2;01 value adjectives too. Notice that these are also the classes that are initially the only possible ones in postnominal position.

DIRECT MODIFICATION A clear pattern emerges at this point. At the onset of his production of adnominal adjectives, Marco only uses some classes with this function: value, colour and dimension. He starts at 1;08 with colour and dimension in postnominal position and at 1;09 with value in prenominal and postnominal position. Interestingly, these are also the classes that Gregorio uses as adnominal modifiers.

It is important to notice that, although Marco produces other categories in isolation or in predicative position at this stage (age, physical property, shape, human propensity), they are not used for nominal modification. This is an interesting point, and deserves further discussion. First of all, it

reveals that semantic classes have an import in the syntax of adnominal modification, as assumed by the theories examined in chapter 1; the presence of only some categories (not represented by only one or two types) and not others, although produced in other contexts, would be unaccounted for otherwise. The issue will be taken up again in section 4.2.3.

INDIRECT MODIFICATION Thus far, I have considered the development of direct modification. I consider now the acquisition of indirect modification. As for Elisa, adjectives that Marco produce in postnominal position are potentially ambiguous between a direct and indirect modification source, but there is no clue pointing to a probable restrictive reading.

The first clear piece of evidence that reduced relative clauses are operative in Marco's postnominal adjectives comes from example (42). *Comprata* 'bought' is a clear reduced relative: it has a result reading (the pistol that has been bought). This is likely not a participle used adjectivally, but a reduced passive relative. Even if this is the case, and it does not count as an adjective, it is important because it is an unambiguous example that reduced relatives have been acquired. Even more important is the fact that it co-occurs with both the determiner and a modal prenominal adjective, which is unambiguously a direct modifier. This example provides evidence that at 2;01 the order Det A N A has already been acquired; in Cinquian terms, both sources of modification are available at the same time in a DP.

- (42) que(s)ta è la vera pi(s)tola comprata [/] comprata ? (Marco 2;01.27)
 this is the real gun bought
 'Is this the real bought gun?'

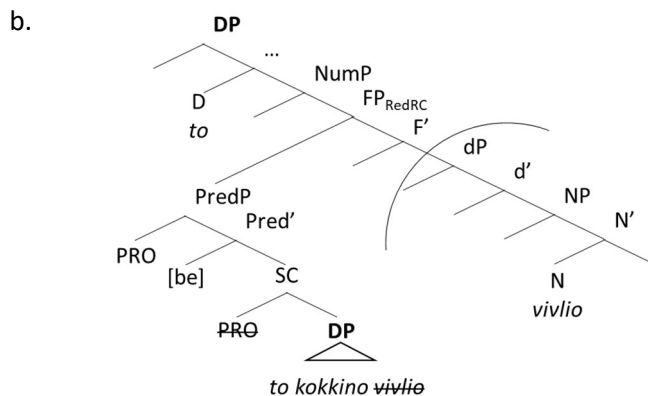
The example in (43) provides another clue to the presence of indirect modification. This production reminds of the Greek phenomenon of double definiteness (also called Determiner Spreading, cfr. Alexiadou et al., 2007; Marinis, 2003, a.o.). In this construction, the adjective is preceded by a definite determiner, as we see in (43): both the noun *palline* ('little balls') and the adjective *altre* 'others' are preceded by their own definite article.

- (43) dov' è [/] dov' è le palline l' altre . (Marco 2;03.02)
 where is the balls-DIM the others
 'where are the other balls?'

In Greek, this construction is only possible with indirect modification adjectives: *to vivlio to megalo* 'the book the big = the big book' has a restrictive, predicative interpretation. Therefore, the adjective should be the predicate of a reduced relative clause. However, *altro* in the example above

may not appear in predicative position in Italian. In Cinque (Cinque, 2010, par. A.5) we find a solution to this problem. He observes that also in Greek some adjectives that cannot be predicative are allowed in double definite constructions, and he proposes that the predicate of the reduced relative clause is the entire DP, with an elliptical noun, as in (44).

- (44) a. *to vivlio* [_{IP} I° [_{DP} *to kokkino VIVLIO*]]
 the book [_{IP} I° [_{DP} the red BOOK/ONE]]



In this way, also non-predicative adjectives may be merged as modifiers of the null noun in the reduced relatives if they can be used in pronominalized DPs. Under this analysis, Marco's production in (43) can be read as in (45).

- (45) *le palline* [_{PredP} Pred° [_{DP} *le altre PALLINE*]]
 the balls [_{PredP} Pred° [_{DP} the other BALLS/ONES]]

Thus far, we have seen two productions that prove the availability for Marco of RedRC modification, one at 2;01 and one at 2;03. Is there any evidence for the presence of reduced relatives before these crucial productions? We have seen, with Raffaello, that the presence of clear null nominal constructions at 2;05, when he starts producing adnominal adjectives, suggests that reduced relatives are available for him. Therefore, an analysis of pronominal adjectives might shed further light on this issue.

PRONOMINAL ADJECTIVES Adjectives in a pronominal DP are very frequent in the speech of Marco. In section 1.6.2, various types of pronominalizations were described: a) the indefinite null nominal construction, in which the pronominal *uno* 'one' occurs with an IM adjective, which often involves *ne* cliticization; b) the definite null nominal construction, with the demonstrative *questo* plus an IM adjective; c) pronominalization of *altro*, with a definite or indefinite determiner; d) DPs with DM adjectives and elision of the noun.

As regards the pronominalization of *altro*, we find some examples in Marco from age 1;09, see (46)a. *Altro* occurs with various determiners, such as the demonstrative (46)b and the definite article (46)c.

- (46) a. (u)n altro . (Marco 1;09.15)
 an other
- b. là quelle altre . (Marco 2;01.11)
 there those others
 ‘there, the other ones’
- c. son(o) là le altre . (Marco 2;01.11)
 are there the others

Marco also produces pronominal structures of the fourth type, with a DM adjective and an article. Some examples are in (47). Until 2;03, this construction only appears with colour adjectives; from 2;03 also with size adjectives. Following the analysis given for this phenomenon, they are non-restrictive, absolute adjectives which modify an elided noun.

- (47) a. rossi (.) i rossi . (Marco 1;08.17)
 red the red
- b. solo il verde e anche il blu . [+ r] (Marco 2;01.27)
 only the green and also the blue
- c. dentro c'è il piccolino . (Marco 2;04.13)
 inside there-is the little-DIM

Let us consider now the first two cases, those of null nominal constructions with a restrictive adjective. We find some examples with the indefinite pronominal *uno* early on:

- (48) a. uno giallo . (Marco 1;09.01)
 one yellow
 ‘a yellow one’
- b. [...] una rossa una blu . (Marco 1;10.26)
 one red one blue
- c. CHI: tante [/] tante una lalla [: gialla] . (Marco 1;10.26)
 many many one yellow
 CHI: una [/] una stella lalla [: gialla] .
 a star yellow

If these productions correspond to the adult one, they would indicate that indirect modification (i.e., reduced relatives) are available for Marco from age 1;09, four months in advance with respect to the evidence reviewed above. In support of this hypothesis is the fact that in (48)a *uno* is not reduced to the standard masculine form of the indefinite article *un* (notice that the child produces

this form with *altro* at the same age). However, it should not be accepted without further proof that a reduced relative is involved.

At age 1;10 we find the first example of pronominalization with *quello* ‘that’, as shown in (49)a. Again, the adult version of this construction would involve a reduced relative, but we cannot exclude the possibility that Marco is simply eliding a noun with a DM adjective, as he does in (47). However, the example in (49)b clearly points to a restrictive reading. This enhances the possibility that the construction corresponds to the adult one.

- (49) a. elo [: quello] ve(r)de . (Marco 1;10.12)
 b. MOT: c' ha anche dei +...
 ‘she has also some...’
 CHI: palloncini . [...] air balloons
 CHI: io quello vola [: viola] . (Marco 1;11.16)
 me that purple
 ‘I (want) the purple one’

If this is the case, and conservatively assuming that this is the first instance of a pronominal reduced relative clause, the availability for Marco of reduced relatives may be anticipated of at least two months.

LEXICALISATION OF THE DETERMINER Is the determiner lexicalised in Marco’s adjectivally-modified DPs? Table A.33 in the Appendix shows that, out of 278 DPs, only 50 (18%) are determiner-less; moreover, the determiner is lexicalised from the outset (age 1;08), both pre- and postnominally.

- (50) a. eh l' oca grande . [+ r] (Marco 1;08.17)
 eh the goose big
 ‘eh, the big goose’
 b. un' altra badierina [: bandierina] . [+ r] (Marco 1;08.17)
 an other flag-DIM
 ‘another flag’

This confirms what has been found for Gregorio, that the relevant DP positions are available, and determiners and adjectives are not mutually exclusive. I will now consider the cases of article omission, to see in which contexts articles are omitted, and to investigate more in general which properties of the Italian DP may be traced. Figure 4.28 shows in what syntactic position determiner-less articles are found.

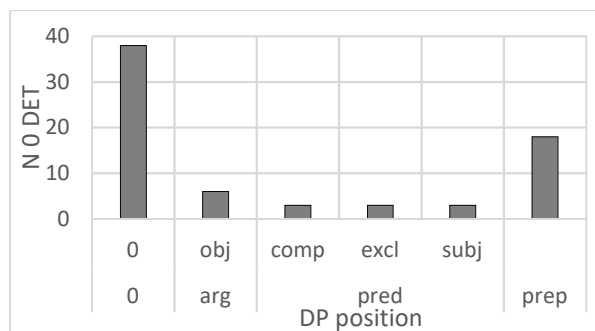


Figure 4.28 Number of determiner-less DPs per position of the DP in Marco's speech

The majority is in isolation, i.e., they are DPs that are not found in a definite syntactic construction. Some examples are in (51).

- (51) a. mone [: omone] tivo [: cattivo] . (Marco 1;09.29)
 man-AUGM bad
 'bad big man'
- b. piccolo palcino [: pulcino] &cino . (Marco 1;10.12)
 little chick

A higher number of article omission is also found when the DP is the complement of a preposition. As already noticed, this is a frequent environment also for non-modified DPs. In predicative and argumental contexts, the number of bare nominals is very low.

In predicative position we find various cases. In (52), some exclamative DPs are reported. In this case, the expression is target-like and does not need a determiner in the target language. (52)b is interesting because it shows the adjective following the personal pronoun *you*. According to Longobardi (1994), pronouns are merged directly in the DP (and not moved there, as proper names are). The fact that it is followed by an evaluative adjective supports the hypothesis that it is generated there, and thus further confirms that the DP is active for Marco at this stage.

- (52) a. beh@i che bel lettino . (Marco 1;09.29)
 well how nice bed-DIM
 'well, what a nice bed'
- b. oh te poerino [: poverino] . (Marco 1;10.12)
 oh you poor-DIM
 'oh, poor you!'

Some DPs are also bare when complement or subject of the predication. The subject cases are all with *dov'è*, the where-is construction, as in (53)a, and are non-target. The case in (53)b is interesting

because Marco is naming an object with the verb ‘to call’, which requires a non-referring nominal expression (thus a denotational one); however, he used one that is modified by an adjective.

- (53) a. *dov' è pitola [: pistola] gialla ?* (Marco 2;00.14)
 where-is gun yellow?
 ‘Where is the yellow gun?’
- b. *si chiama trattore piccolo .* (Marco 2;02.11)
 CL call tractor small
 ‘it’s called a small tractor’

Finally, I consider the cases of omission in argumental position. There are only four cases, and all are object DPs. Both cases in (54) are non-target, as a singular count noun may not be bare in argumental position. (54) b is a case of fronting, as discussed in Gallina (2018).

- (54) a. *no , guarda [: guarda] licotero [: elicottero] piccolo !⁵¹* (Marco 2;00.14)
 no look helicopter small
 ‘no, look at the small helicopter!’
- b. *voce fina [/] fina viene xxx se le mangia . [+ r]* (Marco 2;03.29)
 voice thin comes if CL eat
 ‘if he eats them, he’ll get a thin voice’

As concerns the type of noun that is modified, we find both mass and count nouns. Count nouns are both singular and plural, but the asymmetry that has been observed in chapter 3 (section 3.4.4) is also valid for Marco: plural nouns are only modified by postnominal adjectives. This has also been related to the fact that prenominal adjectives co-occur only with articles, while postnominal ones also co-occur with numerals, quantifiers, and a partitive article, which are all plural.

4.2 General findings

The results reviewed above are revealing in many aspects. In this section, I will address the research questions that I have posed in chapter 2 and propose some considerations on the acquisition of the syntax of adjectives and of the DP.

⁵¹ Notice that the child’s form for helicopter is *licottero*, without the initial vowel /e/. There is the possibility that the /l/ that begins the string is the pre-vocalic form of the definite article, such that Marco interprets it as *l’icottero*, where *l’* = the.

4.2.1 How do children acquire the semantics of adjectives?

The first question is whether children acquire adjectives in an item-based fashion or based on semantic class. A first stage in which acquisition is item-based is expected, but the interaction with semantic class should play a role quite early, based on Tribushinina et al. (2015) and Noccetti's (2015) predictions.

Gregorio's and Raffaello's earliest productions suggest an item-based early stage, at which single lexical items have been acquired. Furthermore, there is wide overlap between children's lexical items. Marco and Raffaello show that the overlap is higher at the outset and decreases over time, which suggests a strong initial correlation and a later differentiation. This result may be related to Tribushinina et al.'s (2014) finding that also the correlation between adjectives in CS and in CDS is initially strong and then decreases over time as children individualize their production; moreover, the adjective lexicon across languages is rather consistent.

At the same time, the clustering into semantic classes starts early. As observed for Marco and Raffaello, adjectives appear in antonymic pairs or as members of contrasting sets. Marco's use of colour terms is in line with Noccetti's findings that, although the meaning of an adjective has not been learnt yet, it is used as a member of its class.

A further observation concerns the most frequent adjectives, which are listed in section 3.4.1. The most frequent adjectives, which are the first to appear, are the core concepts of the value, size and colour classes (*brutto, bello, buono, grande, grosso, piccolo*, colour terms in Marco), plus *altro*. The combination of these factors suggests that the acquisition proceeds with the interplay of item- and class-based processes. It is plausible that children start producing some adjectives based on their single lexical acquisition, but base their productive use on these core concepts, around which they start forming the conceptual classes; class formation precedes the full understanding of the meaning of single adjectives. This process is already evident at age 1;08 in Gregorio, at 1;05 in Marco and partially at 1;07 in Raffaello.

Once children start acquiring adjectives in semantic classes, which classes do they produce? Tribushinina et al. (2014) found that, in the languages they investigated (English, French, Hebrew Turkish and Dutch), the most frequent were value, colour, dimension, physical property and physical state. This corresponds to the Italian productions (note that children are approximately of a corresponding age). The most frequent categories produced are value, colour, dimension and physical property. Physical state is grouped with human propensity here; a zoom in this category

reveals that physical state adjectives are the majority. Furthermore, *altro* has a relevance in the production of Italian children, as found also by Cardinaletti & Giusti (2010). Italian data do not include any temporal or epistemic adjectives, nor material or origin ones. C&G found no shape, nationality or classificatory adjectives, ascribing it to a lack of encyclopaedic knowledge; except for nationality (origin) adjectives, these classes are moderately present in my data. What is interesting here is that the classes that they do find are colour, size and value.

In general, the findings concerning the lexical-semantic acquisition of adjectives confirm what has been found in the studies mentioned above. Adjectives emerge towards the second year of life (here somewhat earlier) and are acquired at a high pace between two and three years of age. The most frequent classes denote concepts that are concrete and/or belong to the conceptual universe of the child, whereas abstract concepts are acquired later. As will be discussed later, this result is important for explaining the acquisition of nominal modification.

4.2.2 How do children acquire the syntax of adjectives?

The first questions I address are: In which position do adjectives appear? Is there a developmental sequence? Blackwell (2000) found stable proportions for her three English-speaking children: adjectives appear 20-30% of the times as copular predicates and 60-70% of the times as prenominal modifiers. These proportions hold across children and across age. Even considering prenominal modifiers as the equivalents of the Italian adnominal position, the Italian data in this study show a very different pattern.

First, the overall result is that adjectives are mainly in isolation⁵²; predicative and adnominal modifiers appear at a comparable rate. Second, differences among children are observed. For instance, Raffaello, Gregorio and Elisa produce more predicative than adnominal adjectives, while the opposite holds for Marco; isolated adjectives are a majority for Marco and Raffaello, but not for Elisa and Gregorio, etc. Third, individual development is observed for all children.

⁵² If adjectives are produced in isolation, the question arises whether they are produced by the child as adjectives or as other parts of speech (or even as uncategorised words). This hypothesis is unlikely. First, as observed, children use adjectives consistently with the communicative context. Second, the results of experimental studies show that children can distinguish adjectives from nouns in their syntactic form and in their core semantic function, i.e., denoting properties.

Although the proportions are different, a common developmental sequence is observed for Marco, Raffaello and Gregorio. At first, adjectives are produced in isolation, in the one-word/two-word stage. The following step is the optional lexicalisation of the copula. Thus, adjectives appear in predicative position before they do in adnominal position.

Adnominal adjectives appear later, they become a majority only in Marco's speech but not in Gregorio and Raffaello's. Postnominal adjectives show a precedence over prenominal ones. In Gregorio's speech, the first appear before the latter, while they are both present at the same time in Marco and Elisa's speech; Raffaello produces only postnominal ones. As a first approximation, this might be ascribed to the higher frequency of postnominal adjectives. The postnominal position is the preferred one in Italian, not only in terms of token frequency, but also because more adjective types are postnominal. However, as will be discussed below, this asymmetry might stem from a deeper structural difference between the prenominal and the postnominal position. The issue will be resumed later.

As concerns the syntax of adnominal adjectives, I will consider their relation to the syntax of the DP first. In chapter two, based on previous works on the acquisition of the DP (Eisenbeiss, 2000; Marinis, 2003; Gallina, 2018), the possibility has been presented that adjectives are in complementary distribution with determiners. This would happen if early determiners were not real ones, i.e., lexicalisation of the D° head in the case of articles, but were impostors, or if only one functional position above N were available to the child, as predicted by the Structure Building hypothesis. As seen in chapter 3 and 4, this is not supported by our data. Adjectives co-occur with articles in the speech of the four children as soon as they appear in adnominal modification. The examples observed in chapter 4 show that, for Marco, this happens both with post- and prenominal modifiers. If articles co-occurred only with postnominal modifiers, the possibility would be left open that the article forms an unanalysed unit with the noun, as in (55). Prenominal modifiers, instead, break up the potential unit of noun and determiner.

- (55) a. l' oca grande . = [l'oca][grande] ? (Marco 1;08.17)
 the goose big
- b. un' altra bandierina = [un [altra] bandierina] (Marco 1;08.17)
 an other flag-DIM
 'another flag'

Gregorio's adjectives, at first, are only postnominal, but independent evidence for the DP is given by the example of a proper name crossing over the adjective, a sign that the DP layer is active, and

that N-to-D movement has happened (at age 1;09). Elisa’s production is fully adult-like; she produced adjectives with determiners, diminutive and evaluative suffixes, etc. Raffaello shows a different pattern: he starts producing adnominal adjectives quite late, at age 2;05, although he produces adjectives in isolation or in predicative position at least from 1;07. He does not produce any prenominal adjectives, but his DPs are already formed when he starts producing adnominal ones. Furthermore, the children’s cases of determiner-less nouns may be independently explained with contexts of omission that have been independently described for the Italian DP (Belletti & Guasti, 2015; Gallina, 2018).

When compared to Greek and German, Italian shows a different behaviour. These languages show that articles are used in a lexically-based way for a certain period. In Marinis’s data, the transition happens towards the end of the second year of life; in Eisenbeiss’ data, it is even later. This is an important finding, because, however Greek and German data are analysed, these data are not universally generalisable. If early articles were indeed a sign that the DP is not active yet, as they interpret it, this would not be caused by a general unavailability of the DP for children at this age, but would be due to a language-specific characteristic of the target-languages.

The evidence reviewed so far suggests that the DP is already available to Italian children when they start producing adnominal adjectives. However, an asymmetry has been observed which allows a deeper analysis of the mechanisms involved in adnominal modification, namely the asymmetry between pre- and postnominal adjectives with plural nouns and determiners.

Singular count nouns are equally modified by pre- and postnominal adjectives (56). Conversely, plural nouns are only modified by postnominal adjectives (57). The only exception is *altro*, which appears preminally four times with a plural noun (58).

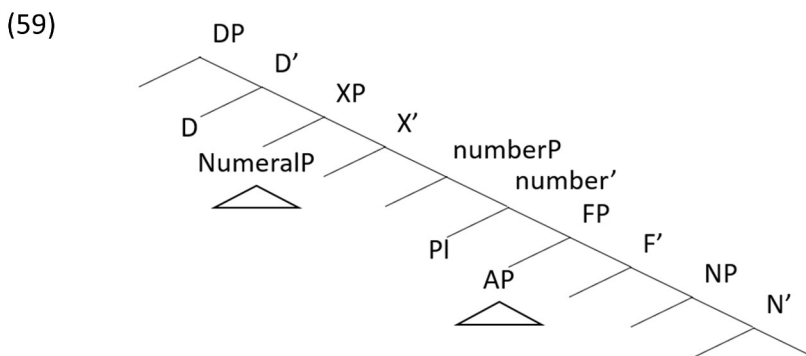
- | | | |
|---------|--|---------------------|
| (56) a. | no , guarda [: guarda] licotero [: elicottero] piccolo !
no look elicopter small
‘no, look at the small elicopter!’ | Marco (2;00.14) |
| b. | [...] guarda la grande cassetta .
look the big box | Elisa (1;10.04) |
| (57) a. | [...] le orecchie nere .
the ears black | Marco (2;03.02) |
| b. | con [/] con i mulini bianchi [...]?
with the mills white | Raffaello (2;11.20) |
| (58) a. | sono (a)ndati da [/] da [/] da altri bimbi ?
are gone to other children
‘are they gone to other children?’ | Marco (2;03.29) |

- b. le **a(l)tre** tazzine dove +...
 the other cups-DIM where ...
 'where (are) the other cups?'

Elisa (2;01.20)

Why this asymmetry? There are 26 nouns modified by a postnominal descriptive adjective, but none by a prenominal descriptive or modal one.

To seek a syntactic explanation of the phenomenon, we must start by defining how the plural is syntactically instantiated in the DP. The tree in (59) is taken from Cinque (2013). The number projection (hence the plural feature) is merged below the one hosting cardinal numerals but above the functional projection hosting DM adjectives. The same structure of merge is introduced by Svenonius (2008) with different labels: [_{UNIT P} NumP [_{PIP} [PI° [... AP ... N]]]]. I take the head of numberP to host the feature of [+plural] (hence PI°), and singular to be the default option in lack of this feature.

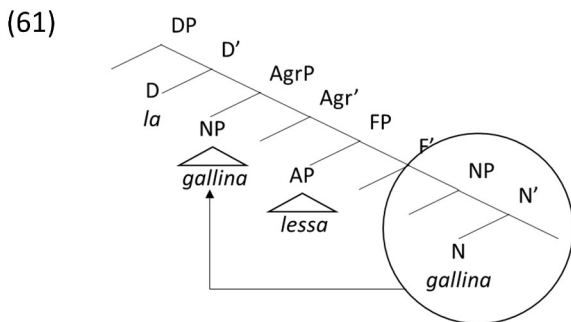


When the DP is plural, the noun must raise above the plural head to get plural morphology. How does this movement happen? According to the theory developed in (Cinque, 2017), it is not the NP itself that moves (at least in Italian), but the whole chunk of structure below PI, meaning that the NP has pied-piped the whole structure to raise with it. There are two possible types of pied-piping, *progressive* and *regressive* pied-piping. Progressive pied-piping is of the *whose-picture* type (*Whose pictures have you seen?*), in which the element that is responsible for the raising (NP in this case) has first moved to a specifier of a higher projection and raised with it. Conversely, regressive pied-piping is of the *picture-of-whom* type (*Pictures of whom have you seen?*); in this case, the pied-piping involves feature's percolation: the feature relevant for raising (here [+N]) percolates from its original projection to the higher projection that then gets moved.

Let us see some practical examples⁵³. First, I will examine the derivation of the singular through the two types of pied-piping; and then compare them with the plural. (60)-(61) show again how the postnominal position is derived. After merger of AP, the NP is attracted above it. Presumably, the reason for this movement is the sharing of some relevant feature, possibly the [+N] feature (cfr. Cinque, 2017, fn. 21).

(60) &m [//] la gallina lessa .
the chicken boiled

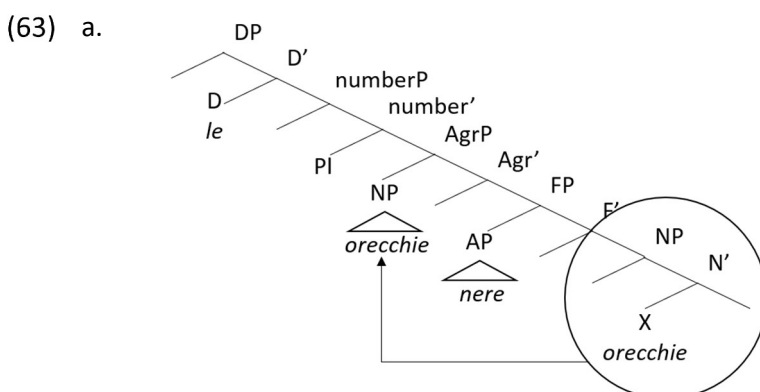
(Elisa 1;11.19)



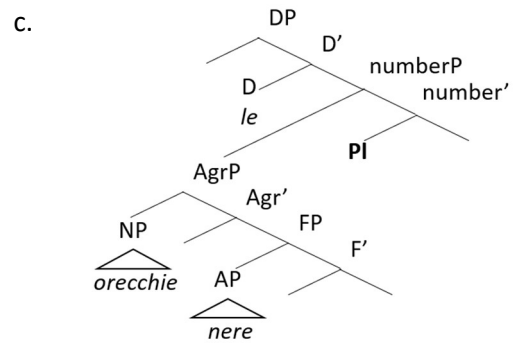
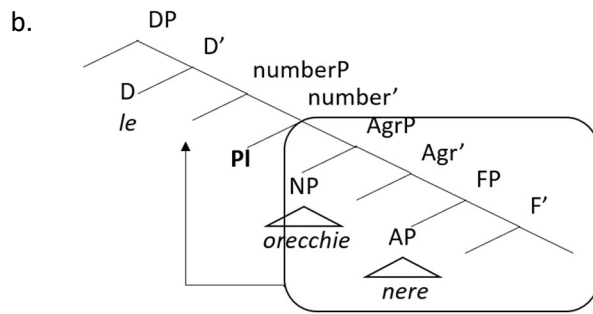
Given the example above, the derivation of a plural DP involves a further step. The utterance in (62) is produced by Marco at 2;03; the plural noun *orecchie* is followed by the adjective *nere*, black. The noun has raised past the adjective (63)a. To take plural morphology, the noun must now raise to Spec,numberP; to achieve this, the whole chunk of structure dominated by AgrP raises to that specifier (63)b. The final state is the one in (63)c.

(62) [...] le orecchie nere .
the ears black

Marco (2;03.02)



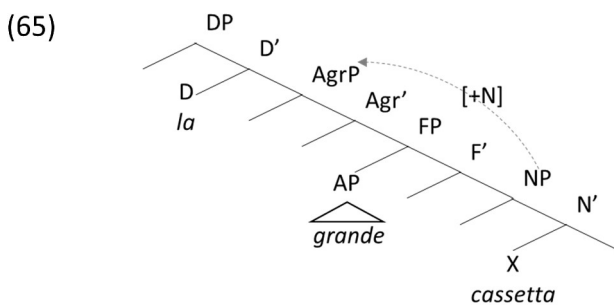
⁵³ The examples below are simplified; for a complete analysis of these derivations see Cinque (2017, pp. 14–22).



The derivation seen above is valid when the adjective is postnominal. Children do produce this kind of plural DPs. On the contrary, they do not produce any plural DPs with a prenominal DM adjective. With a prenominal adjective, the noun does not raise past the adjective; therefore, to share the relevant nominal feature another operation is needed, namely regressive pied-piping. In this case, the feature ‘percolates’ upwards.

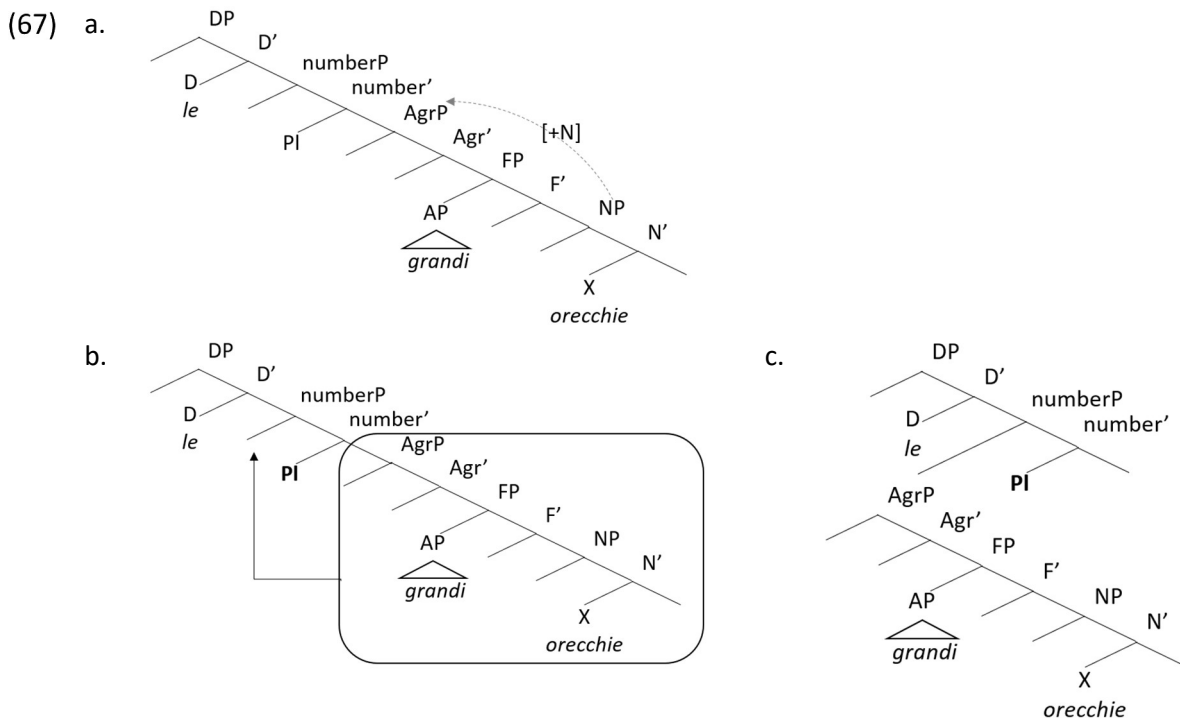
(64) [...] guarda la grande cassetta .

Elisa (1;10.04)



Let us now see the derivation of a plural DP (67). As before, since the adjective is prenominal, the noun does not raise past it, landing in the above specifier. The additional step is required by the merge of the plural feature in PI° . Because movement past the plural head is required, the pied-piping happens through the percolation of the nominal feature to AgrP (67)a, such that the whole chunk of structure containing the NP is raised to receive the number feature (67)b and the order between noun and adjective is preserved.

(66) le grandi orecchie
the big ears



As suggested by Cinque (2017, pp. 33–34), the relevant kind of pied-piping is driven by the adjective itself: postnominal adjectives are endowed with a [progressive pied-piping] feature, whereas prenominal adjectives are endowed with a [regressive pied-piping] feature. The pied-piping feature might be endowed to single adjectives (such as *medio* ‘average’ in Cinque’s example, which is always postnominal: *l’italiano medio* ‘the average Italian’) or to adjective classes (such as Origin, whose members are always postnominal).

The question now arises why children produce plural DPs with postnominal but not with prenominal adjectives. Since the two structures differ in the type of pied-piping they involve, it is possible that one structure is more difficult to produce for the child than the other. Indeed, Cinque notices that there is an asymmetry in the languages of the world with regards to word orders in that progressive pied-piping appears to be less marked than regressive pied-piping. A tentative account of this fact is given by Rizzi, who suggests that the structural cause for this asymmetry is that regressive pied piping involves a more complex upward percolation of features, whereas the pied-piping in the progressive type can be independently accounted for (e.g. through Spec-Head agreement) (Cinque, 2017, fn. 32).

Therefore, my proposal is that the derivation of prenominal adjectives in plural DPs is blocked because of the markedness of the derivation through regressive pied-piping. This proposal poses on several assumptions. First, children must have learnt that adjectives might be endowed with one or

the other feature. This is indeed the case: as we have seen, children behave in an adult-like way almost from the outset as far as adjective positioning is concerned (a result confirmed also by C&G), and respect the patterns for adjectives or adjective classes that are present in the target language. Second, the functional structure of the DP must be built and operative. This is also the case, as we have seen that determiners co-occur with adjectives (both pre- and postnominal) and that there is consistent agreement between adjectives, nouns and determiners.

Notice that the absence of prenominal adjectives in plural DPs cannot be ascribed to a difficulty with the plural feature itself, since adjectives do occur in plural DPs otherwise. Furthermore, the problem cannot be with prenominal modification, because a plural DP may be modified by *altro* (as in (68)).

- (68) a. [...] an(che) [//] anche altre palle . Marco (2;03.15)
 also also other balls
- b. le a(l)tre tazzine dove +... Elisa (2;01.20)
 the other cups-DIM where ...
 ‘where (are) the other cups?’

Indeed, *altro* of the additive type does not pose a problem for the derivation of the plural, because it is merged above the number projection, more precisely it selects the cardinal number’s projection (see Chapter 1, section 1.3.4). Therefore, it is not involved in the NP’s raising (69).

- (69) a. gli altri due libri
 the other two books
- b.
-

The fact that children produce DPs modified by *altro* and not DPs modified by any other prenominal adjective strongly supports the analysis outlined here. This, in turn, supports Cinque’s theory on the syntax of adjectives (the fact that all adjectives are merged prenominally and that postnominal position is derived through phrasal movement of the NP or a bigger constituent containing it), as this derivation directly accounts for the phenomenon examined above.

In sum, children show the ability to use both types of pied-piping, but they avoid using the more marked one, due to the excessive computational load when an additional operation, such as plural marking, is involved in the derivation. This gives us further insight on the general higher frequency of postnominal adjectives and the fact that there seems to be a sequence of acquisition: postnominal < prenominal. In this analysis, it would not be only due to a higher surface frequency, but to the preference for the unmarked order. Given that progressive pied-piping (postnominal position) is the default option in Italian, language-specific preference and structural markedness converge on the preference for the first option.

The result is important in suggesting that, at least in this case, children's non-adultlike behaviour is not due to a deficiency in the grammar, but to an avoidance due to performance⁵⁴.

4.2.3 How do children acquire the alleged syntax-semantics mapping?

Two orders of questions have been posed. The first concerns the two types of modification, direct and indirect modification. Is there any evidence of children's acquisition of the two types of adjectives (DM and IM ones)? Are the implicational scales DM<IM and Pred<IM respected? The second concerns the mapping of semantic classes onto the hierarchy.

We have found evidence that reduced RCs are available to Marco at age 2;01. Further, the target-like use of null nominal constructions in the speech of Raffaello suggests that IM is also available to him at age 2;05, when he starts producing adnominal adjectives. The same consideration might be applied to Marco to anticipate his acquisition. The prediction that IM entails the availability of adjectives in predicative position is borne out and it appears that also DM precedes IM.

The hypothesis has been advanced that IM is more complex than DM, semantically, as IM implies the combination of two properties, and syntactically, as it requires that the syntax of reduced relative clauses has been acquired. It might be tentatively argued that two strategies are employed for avoiding these complexities. Elisa, on the one hand, produces full relatives instead of reduced ones; Marco and Raffaello use null nominal constructions.

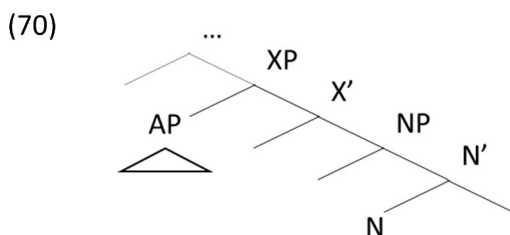
⁵⁴ Table 3.10 showed also that postnominal adjectives occur with demonstratives and prenominal ones do not. However, there is only one context of production in Elisa; the data are too scarce to draw any conclusion. Should this be confirmed with additional evidence, a further explanation should be sought for demonstrative determiners, perhaps along the same lines.

Thus, the two types of modification seem to play a role in acquisition and to be semantically and syntactically distinguished; children follow different acquisition paths, but they respect the implicational scales that have been individuated.

The second concerns the analysis of the direct modification hierarchy. How is DM acquired? Is there a relevance of semantic classes for adnominal modification? Which hypothesis best describes the data?

As seen in the individual analyses, DM is tied at first to some semantic classes: value, dimension and colour (and *altro*, which is not relevant here). These are the only categories that are produced by Gregorio, and by Marco for a period of five months⁵⁵; as noticed, this speaks for the relevance of semantic classes in the acquisition of adnominal modification, at a younger age than what would be predicted by Lee et al.

What does this tell us on the acquisition of nominal modification? A first hypothesis might be that at first a single adjective position is built (or activated) in the nominal extended projection (70), and expanded afterward to mirror the richer functional hierarchy in the target language.



Marco's data, however, do not support this hypothesis. If this single projection is underspecified for semantic features, any adjective should be able to be merged in its specifier, but only three classes appear instead. Alternatively, if this adjectival projection were specified for one semantic feature, we would expect only one adjective class to appear at first as adnominal modifier⁵⁶. This, again, is not what we find in Marco's production. The next possibility is that the whole hierarchy is already

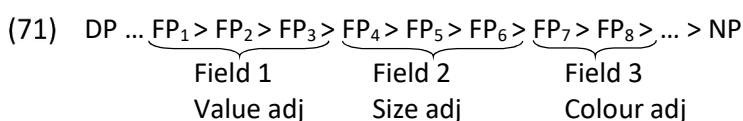
⁵⁵ Note that the possibility that in some cases the adjective is an IM one does not affect the analysis; the fact that only these are used and all other classes are excluded is relevant here.

⁵⁶ This possibility cannot be totally rejected. It might be a sampling fact that in our data two classes (colour and size) appear together. It is still possible that for a short period only one projection has been activated. However, such hypothetical first stage is not mirrored in the data. Besides, the stage in which only value, colour and size adjectives are adnominal is very long (five months); and sampled with a bi-weekly frequency. This makes it highly improbable that this trend is due to sampling error.

built. But this alone is not sufficient to account for the data; in this case, any adjective should enter the hierarchy.

A fundamental factor should be taken into account: to be merged as an adnominal modifier, an adjective needs to be endowed with the relevant feature. We have seen that, in the period of time that immediately precedes and overlaps with the first production of adnominal adjectives, the first evidence emerges that adjectives are being grouped as members of semantic classes based on some high frequency adjectives that denote the basic concepts of the class they belong to. These lexical items are also the ones that appear as the early adnominal adjectives. It is possible that through this process they be endowed with the features that allow them to be merged as direct modifiers. These features might be [colour], [value], [dimension], but also more specific or less specific ones. This suggests that there is a lexical-semantic side to the acquisition process. At this point, some adjectives are endowed with three core semantic features that allow them to be merged in the nominal projection.

Let us now recall the proposal made in chapter 1 that the DM hierarchy is not continuous, but is organised into DP-modification fields, in the sense of Benincà & Poletto (2004). The nature of the three core categories suggests that they may represent three different fields. In Svenonius (2008), colour is associated with one type of modification (the head nP) and size with another (the head SortP). A third field would be represented by value, which has been classified aside from descriptive adjectives and together with modal ones⁵⁷. Thus, the three core classes would be manifestations of these three fields.



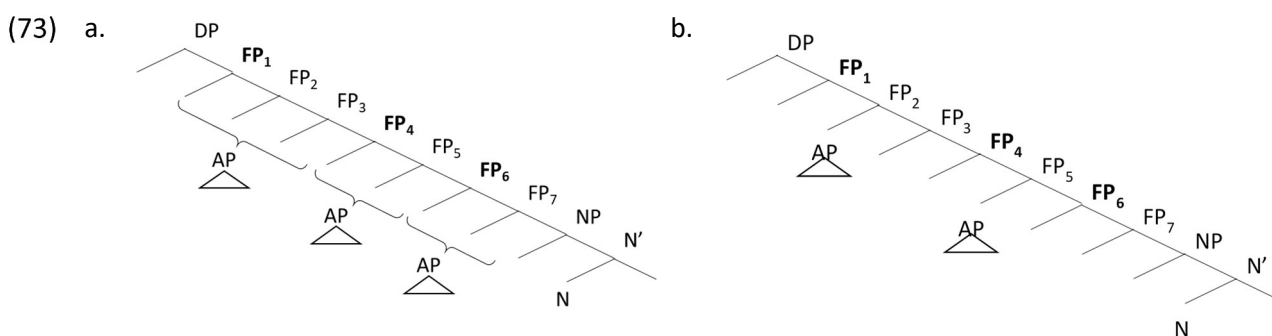
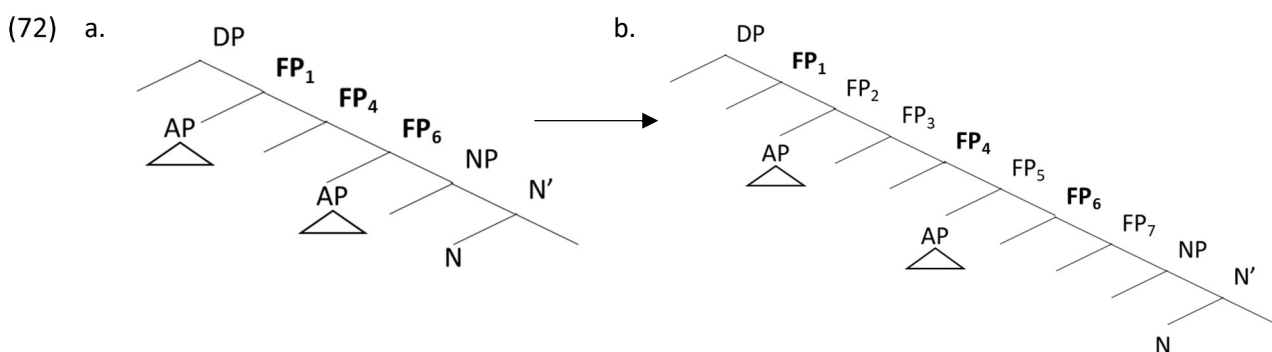
The logical continuation of this acquisition process is that Marco, as soon as he detects further features in the input, maps them onto the specific projection, thus ‘splitting’ the three fields.

In chapter 2, three hypotheses have been posed, making two different predictions. In the Full structure hypothesis, the structure is entirely available; it may be truncated, but all projections

⁵⁷ An indirect corroboration of the partition of dimension and value adjectives is found in Cinque (2015b), where the structural position of augmentative, pejorative, diminutive and endearing heads is placed between the value and the dimension projection.

below the truncation point should be active. The Revised structure building and the Splitting hypothesis, instead, predict that only some core projections are used for adnominal modification at first. The second prediction fits with the data seen so far: at least in the speech of Marco, three core categories (colour, value and dimension) are the ones employed at first for direct modification; after age 2;01 (but especially from 2;03) the possibility of modifying the noun is extended to other categories.

The data are not sufficient for discriminating between the Revised structure building and the Splitting hypotheses, as the predictions on this point coincide. On the one hand, the child may have discovered only these three features in the input and mapped them on the structure (72)a; the later split would depend on the discovery of further features in the input and their insertion in the tree (72)b. Alternatively, the structure may be all projected and the heads may be grouped together at first and then 'split', i.e., each head may merge its own modifier.



In both cases, what we observe is an initial limitation to the three core classes and then an expansion to other classes. In summary, the patterns of modification that are observed for some of the children may be tentatively seen to support the hypothesis that direct modification is organised into semantic fields.

Conclusions

The purpose of this study was to investigate how Italian-speaking children acquire the syntax of adjectives, in its interaction with the syntax of the DP. A review of the literature revealed also a possible interaction of direct modification with semantic classes; therefore, this aspect has also been taken into account. An attempt was made to compare the results of this investigation with some predictions for language acquisition made by a cartographic approach to syntax. For this purpose, a longitudinal spontaneous production study has been conducted on the speech of four children aged between 1;5 and 2;11. Some interesting conclusions that have emerged will be summarised here, together with some open questions that remain.

First, there is convincing evidence that children, after an initial period of lexically-based acquisition of adjectives, start to group them early into semantic classes, often based on the contrastive meaning of antonymic pairs or contrast sets; that the acquisition of their full meaning partially follows this operation and, for at least some of the children, is supported by contrastive comparisons. These results are in line with the findings of Tribushinina et al. (2015) and Nocetti (2015), and are relevant for the present study from a syntactic point of view: the very same adjectives that are involved in this grouping are the first used for direct modification.

As concerns the semantic classes produced, Italian children seem to conform to the cross-linguistic pattern individuated by Tribushinina et al. (2014). Two groups of semantic classes are identifiable. One is formed by classes which include adjectives denoting concrete concepts; they are distinguished by a high token and type frequency and, in the languages studied by Tribushinina et al., show a development in use over time. A second group is that of classes that denote more abstract concepts and are represented by only a few tokens and types and, in the cross-linguistic study, do not show a development. In this case, a cross-linguistic solid tendency emerges which is likely due to general principles of cognition: the adjective classes that are produced at first are characterised by the cognitive accessibility of the concepts they denote to young children.

Second, an acquisition sequence emerges in the syntactic positioning of adjectives: they are placed first as complements of a predicate, then as direct nominal modifiers and finally as indirect modifiers. Within direct modification, postnominal adjectives seem to precede prenominal ones. This sequence is in line with the predictions made in chapter 2: that indirect modification

presupposes the availability of the predicative position and that direct modification is semantically and syntactically simpler than indirect modification (IM). When compared to Cardinaletti & Giusti's (2010) study, this both confirms and enriches their results. They also found that the acquisition of DM precedes that of IM, although on a different basis. While I have reached this conclusion based on syntactic behaviour, C&G found that stage-level adjectives are acquired later than other typically non-restrictive classes (colour, value, dimension). I have chosen to be more cautious and to not identify any adjective as intrinsically stage-level; only those that had a clear restrictive, stage-level or result reading were coded as such. However, returning to the issue, it may be noticed that adjectives that are typically restrictive or stage-level are mainly found in the physical property and in the human propensity classes: adjective such as *sporco* 'dirty', *bagnato* 'wet', etc. This also corresponds with Blackwell's finding for English that adjectives in these two classes are tied to the predicative position; therefore, Cardinaletti & Giusti's interpretation should not be discarded. If these adjectives are *typically* used as stage-level, indirect modifiers, they are probably used more frequently with this function. A more refined analysis should be performed in order to determine, if possible, which adjectives are used as direct or indirect modifiers, in adult and in child speech.

Thirdly, adjectives have not been found to be in complementary distribution with determiners, as articles and adjectives co-occur from the first use of adnominal modification. This is important in suggesting that adjectives are inserted in a nominal extended projection in which the DP level is already built or active. Based on the predictions made in chapter 2, this result would support a Full structure hypothesis, in which the structure is already available to the child. However, caution is needed. Adjectives are optional modifiers; their use for adnominal modification may be preceded by a phase of structure building of the fundamental projections, in which optional elements are inserted only later. In any case, these results allow a comparison with the different ones in German and Modern Greek, in which articles are used as impostors until a later age (1;11 in Marinis; after age 2;00 later on). As pointed out by Marinis (2003), there is also a difference between these two languages: in German, indefinite determiners are acquired before definite ones, while the opposite holds for Greek. Marinis ascribes this difference to language-specific properties of definite articles in the two languages at the prosodic, lexical and semantic level (cfr. Marinis, 2003, par. 8.2). Definite articles are monosyllabic in Greek and are prosodically clitics. Indefinite articles, on the contrary, are disyllabic, and form a word of their own. Moreover, they consist of two lexemes for masculine and neuter (*enas, ena*) and for feminine (*mia*), and alternate with bare nominals to express indefiniteness. This may also be applied to Italian: the early manifestation of articles or of their

substitutes (monosyllabic placeholders, cfr. Belletti & Guasti, 2015) may rest on their phonological dependence on the following word and on other facilitating factors. In this perspective, articles occur very early with a functional use and are not merely prosodic or lexical items; adjectives are used in a developed DP. This means that the possibility of having an active DP is open earlier than would be expected by German and Greek data. Two conclusions may be drawn from this comparison. On the one hand, it is possible that also Greek and German early articles, although lexically-based, are expressions of a functional projection, possibly a DP. On the other, the grammatical representation may differ, and the DP level may be acquired later than in Italian.

Further insights on the functioning of the early DP are given by the prenominal-postnominal asymmetry of plural modified nouns. As discussed in chapter 4, this asymmetry reveals that non-adult productions (better, the avoidance of structures that are present in the target language) is not due to a deficiency in the child's grammar or lack of a relevant projection, but to a higher computational load in the derivation. Both plural modified DPs and prenominal modification are individually present in children's speech (although not all of them: Gregorio only modifies singular DPs; Raffaello produces only postnominal adjectives), but are not combined. This supports a view of acquisition in which the structure is formed but external factors influence performance.

A fourth result complicates the picture. The hypothesis that the structure is fully formed when adjectives are inserted in the DP is partially in contrast with the fact that only three core classes are projected at an early phase by two of the children. If the analysis attempted above is correct, namely that adjectival modification is organised in 'fields' that share a common semantic trait but can be split into more fine-grained separate projections headed each by a single feature, the syntax-semantics mapping would proceed in a step-wise fashion, first major core features and then more specific ones. This hypothesis receives support by the way in which semantic classes are built at this stage of acquisition, as discussed above. In a wider perspective, this also stresses the importance of the interaction with input and the importance of early lexical acquisition to initiate the mapping onto syntax. In order to acquire semantic classes, children learn first adjectives as single lexical items and start mapping them onto a meaning, but this process brings to an early grouping of adjectives that share a common feature. Through this process, adjectives receive the possibility of being merged in a projection headed by the same relevant feature.

This is not in contrast with a cartographic approach. Although the features are already available for the acquisition process, they need to be discovered from the input and mapped onto the correct

words or structures, and this cannot be achieved without a phase of lexical learning. This recalls precisely Eisenbeiss definition of the Lexical Learning approach, repeated here from chapter 2, par. 2.4.1: “children are equipped with an inventory of potential grammatical features” which “function as predispositions for the categorization of syntactic and morphological elements” (Eisenbeiss, 2000, p. 32). The main difference with the cartographic approach is that, in the latter, the features are already organised in a universal hierarchy, such that the child does not have to build the structure from scratch, but is either able to order the projections he discovers, or already able to project the entire structure. The fundamental interaction with the input remains, more specifically a first dependence on single lexical items and later their categorisation.

In the previous discussion, the hypothesis has been advanced that all features are already present in UG and are in some way available to the child. This corresponds to the strongest version of the cartographic approach. A weaker possibility is that not all features are universal, and that some are acquired as language-specific. Hypothetically, all children could be able to group adjectives based on colour, dimension and value, but other features such as length or speed would be present only in some languages and mapped only by children who acquire those languages. This question remains open, and speaks for the necessity of the cartographic approach to challenge its theory with predictions for language acquisition and the results of acquisition data, and to refine its theory accordingly.

It should be considered that this study has focused on the detailed analysis of a limited set of data from a small number of corpora. The results show some similarities between children, but also patterns of individual development. Similar behaviour is found in the production of semantic classes, which are the same in the four children, although with individual different rates. It is also observed in common patterns of development as concerns the syntactic positioning of adjectives, as discussed above. Individual differences in the syntactic development are also present. Marco shows an incremental acquisition of adnominal modification, whereas Raffaello starts producing adnominal adjectives late but in different forms simultaneously (DM, IM, pronominal). Gregorio produces only postnominal adjectives for the first period and prenominal ones in the last month recorded, whereas Marco has adjectives in both positions from the outset. Further research should be carried out to determine whether other children follow the developmental paths that have been outlined here and whether there are recurrent trends. Likewise, the hypothesis has been advanced that Elisa is at a stage in which she does not produce reduced relatives, but substitutes them with

full ones. This possibility would be reinforced if the same behaviour were observed for other children. Therefore, it would be appropriate to expand the analysis of individual aspects to other corpora. Furthermore, these results should be compared with an analysis of the same phenomena in the input.

Some questions remain open. A first aspect that has not been looked into is the internal syntax of the adjectival phrase. The four children modify adjectives with suffixes and adverbs, they produce them in coordination and modify their grade. Further research should be conducted to determine the development of these phenomena and their interaction with the placement of adjectives.

Further, the production of predicative adjectives has been described, but not thoroughly analysed. A comprehensive study should be carried out in order to better understand the interaction between copular predication and adjectives, and between adjectival and verbal use of participles.

Only the earliest phase of syntactic acquisition has been considered. The later development of some aspects should also be taken into account. Firstly, when do children start producing prenominal adjectives with plural nouns? If the avoidance is to be explained with derivational complexity, there should be a moment in which this difficulty is overcome. The four children studied here do not produce any eventive noun modified by an adjective. Since eventive nouns are modified by different categories of adjectives, such as thematic and modal (speaker-oriented, epistemic, subject-oriented...) ones, the question arises of when these adjectives start being produced.

In addition, spontaneous production data should be integrated with experimental methods. In many cases, elicited production studies show that children may produce structures that are avoided in spontaneous speech; moreover, production and comprehension of the same phenomenon are not always aligned. Experimental work would shed new light on the children's ability to produce complex DPs, on the mechanisms that underly adjective positioning and on the interaction with semantic classes.

To conclude, the results of this study support, in my view, a generative approach to language acquisition. The complex operations that are involved in the acquisition of the syntax of adjectives, although highlighting the role of input and lexical acquisition, could hardly rely exclusively on them, but would be better explained if the child were equipped with some tools to elaborate the input and to bootstrap the acquisition of syntax. Furthermore, the application of a cartographic approach to syntax has revealed that it can make interesting predictions, permitting a novel perspective on and a deeper analysis of acquisition data, but is also challenged in some respects. This states the

necessity for it, and for any theory of syntax, to prove and refine itself against the prediction that they make for language acquisition.

Postscript

The intrinsic limits of time, space and possibilities of a Master's thesis do not allow to excessively prolong the work. However, upon a further review of the data that have been analysed in chapter four, I have come to reconsider some lines of interpretation. Since a thorough readjustment of the whole thesis is not possible, I will report some considerations here.

Marco's use of adnominal adjectives may not fully support the splitting analysis that has been advanced. From age 2;00 onwards, excluding colour, dimension and value, most adjectives that he uses adnominally may be traced back to two cases:

A) Classificatory adjectives: not only adjectives that are classificatory or idiomatic in the target language, as in (1)a, but also expressions that may have been learnt as such, as in (1)b, which refers to the wolf's voice in a fairytale;

(1) a. sì, dov' è un di(s)co volante ? (Marco 2;03.15)
yes where is a disc flying
'yes, where is a flying saucer?'

b. voce fina [/] fina viene xxx se le mangia . [+ r] (Marco 2;03.29)
voice thin comes if them.CL eat
'if he eats them, he'll get a thin voice'

B) Clear reduced relatives, as in (2).

(2) gia(rd)ino coltiva(to) . (Marco 2;03.15)
garden cultivated
'cultivated garden'

The only cases that really stand out are the modal adjectives *vero* 'true' and *giusto* 'right', and one instance of double adjective that is however not really clear (4).

(3) a. dov' è soldino vero ? [+ r] (Marco 2;01.11)
where is coin-DIM true
'where is the real coin?'

b. con la parte giusta . (Marco 2;01.27)
with the side right
'with the right side'

(4) libruni [: libroni] drane@wp pesante . (Marco 2;04.26)

Therefore, there may not be a later split of projections after a period in which only value, dimension and colour are merged, but only the activation of a modal and a classificatory position.

In any case, although the Splitting hypothesis itself, which has been tentatively advanced, is challenged by lack of sufficient data, I believe that the main point concerning Marco's acquisition of adnominal modification is not much affected. The fact remains that, although producing adjectives from other semantic classes, for many months he only uses colour, dimension and value for adnominal modification. These classes are the most frequent and productive in his speech; thus, it is still possible that the process of feature mapping due to early semantic classification that has been examined based on Tribushinina et al.'s (2015) work underlies the possibility of merging only certain adjectives in the DP.

A second re-evaluation concerns Marco's early co-occurrence of determiners and adjectives. It has been argued that, since Marco, as all the other children, produces adjectives and articles together at the same time, there is not a phase of alternation between the two. It may be observed, however, that, at first, most DPs occur in isolation and without a determiner. The few cases of D+N followed by a postnominal adjective may be interpreted as a unitary word by the child, as [loca] in (5). Moreover, the only cases of prenominal adjectives with a determiner involve *altro*, as in (6).

- (5) eh l' oca grande . [+ r] (Marco 1;08.03)
 eh the goose big
 'eh, the big goose'
- (6) un' altra badierina [: bandierina] . [+ r] (Marco 1;08.17)
 an other flag-DIM
 'another flag'

Notice that the two cases with *altro* at age 1;08 are repetitions with an indefinite determiner of mother's utterances that employ the definite one. This may be due to the fact that Marco can only produce D(indef) + Adj as a formula, or on the contrary as a personal elaboration which shows that the grammar is already built. Although the first possibility cannot be discarded, I find the second to be more likely, and the lack of descriptive prenominal adjectives to be rather ascribed to the markedness of regressive pied-piping, as discussed for the derivation of the plural. If both objections hold, we may observe in Marco a brief period of complementary distribution of adjectives and determiners at age 1;08 (and perhaps 1;09).

Appendix

A.1 Classification of adjectives

Semantic Class	Type Adjective	Semantic Class	Type Adjective	
PRE-CARDINAL		DESCRIPTIVE		
Altro	<i>Altro</i> altro 'other'	Dimension	<i>Size</i> gigantesco 'huge', grande 'big', grosso 'big', piccolo 'small'	
Solo	<i>Foc</i> solo (foc) 'only'		<i>Height</i> alto 'high'	
Modal	<i>Comparison</i> diverso 'different', uguale 'same'		<i>Length</i> corto 'short', lungo 'long'	
	<i>Evidential</i> finto 'fake', vero 'true, real'		<i>Width</i> grasso 'fat', largo 'large', magro 'thin'	
	<i>Conformity</i> giusto 'right', sbagliato 'wrong'		<i>Speed</i> veloce 'fast'	
Value	<i>Value</i> Bello 'nice, pretty', bravo 'good', brutto 'ugly', buffo 'funny', buono 'good', carino 'pretty', caro 'dear', cattivo 'bad', dolce 'sweet', forte 'strong', ganzo 'cool' infame 'infamous', infernale 'infernal', interessante 'interesting', malandrino 'mischievous', mascalzone 'rascal', povero 'poor', santo 'holy', scemo 'dumb', sciocco 'dumb', tremendo 'terrible'		<i>Strength</i> forte 'strong'	
			<i>Position</i> lontano 'far'	
			<i>Quantitative</i> intero 'whole', pieno 'full' solo 'alone', vuoto 'empty'	
			Human Propensity	<i>Physical State</i> dritto 'straight', fermo 'still', forte 'strong', malato 'sick' pronto 'ready', risorto 'reborn', seduto 'seated', stanco 'tired', sveglio 'awake', zitto 'silent'
				<i>Behavioural</i> birichino 'naughty', coraggioso 'brave' feroce 'ferocious', ghiotto 'greedy'
		<i>Internal State</i> arrabbiato 'angry', attento 'careful', capace 'able', content 'glad', felice 'happy', matto 'crazy', pazzo 'crazy', sicuro 'sure'		

Table A.1 Semantic classification of the adjectives produced by Elisa, Gregorio, Raffaello and Marco

Semantic Class	Type Adjective
DESCRIPTIVE	
Age	<i>Age</i> nuovo 'new', Vecchio 'old'
Physical Property	<i>Surface</i> pulito 'clean', punteggiato 'dotted', sporcato 'dirty', sporco 'dirty'
	<i>Wetness</i> bagnato 'wet'
	<i>Consistency</i> duro 'hard', morbido 'soft'
	<i>Edibility</i> agro 'sour', buono 'good', cotto 'cooked', crudo 'raw', dolce 'sweet', lessato 'boiled', maturo 'ripe'
	<i>Configuration</i> aperto 'open', attorcigliato 'twisted', bruciato 'burnt', chiuso 'closed', ciucciato 'sucked', consumato 'consumed', coperto 'covered', gonfiato 'inflated', gonfio 'swollen', incartato 'wrapped', legato 'tied', nudo 'naked', rotto 'broken', rovinato 'ruined', sbucciato 'peeled', scritto 'written', sgonfiato 'deflated'
	<i>Weight</i> leggero 'light', pesante 'heavy'
	<i>Temperature</i> bollente 'boiling', caldo 'hot', freddo 'cold'
	<i>Sound</i> fino 'soft'
	<i>Light</i> buio 'dark'

Table A.1 (continues)

Semantic Class	Type Adjective
DESCRIPTIVE	
Shape	<i>Shape</i> tondo 'round'
Colour	<i>Colour</i> arancione 'orange', azzurro 'light blue', bianco 'white', biondo 'blonde', blu 'blue', giallo 'yellow', grigio 'grey', marrone 'brown', moro 'dark-haired', nero 'black', rosa 'pink', rosso 'red', verde 'green', verde_blu 'blue-and-green', viola 'purple'
CLASSIFICATORY	
Classificatory	<i>Classificatory</i> acceso 'on', avvelenato 'poisoned', sportivo 'sports', viaggiante 'travelling', volante 'flying'
	<i>Idiomatic</i> filante
	<i>Relational</i> pecorino
STAGE-LEVEL	
Result	<i>Result</i> acceso 'on', assicurato 'insured', colorato 'colourful', coltivato 'cultivated', comprato 'bought', disegnato 'drawn', imprigionato 'imprisoned', pitturato 'painted', sparato 'shot'
Stage-level	<i>Stage-level</i> finite 'finished', pronto 'ready'
OTHER	
Nonce	<i>Nonce words</i> barucca, sugo

A.2 Output per file

ELISA		
Age/file	Tokens	Types
1;10	13	7
011004.cha	9	6
011018.cha	4	3
1;11	30	13
011104.cha	2	2
011119.cha	28	12
2;01	29	15
020106.cha	5	3
020120.cha	10	5
020122.cha	8	4
020123.cha	6	4
Total	72	27

Table A.2 Total tokens and types produced by Elisa in each recording

GREGORIO		
Age/file	Tokens	Types
1;07	4	3
010717.cha	4	3
1;08	16	8
010807.cha	6	5
010822.cha	10	6
1;09	28	13
010924a.cha	19	7
010924b.cha	9	7
1;10	6	6
011009.cha	6	6
2;00	29	14
020010.cha	16	8
020029.cha	13	9
Total	83	23

Table A.3 Total tokens and types produced by Gregorio in each recording

RAFFAELLO		
Age/file	Tokens	Types
1;07	6	2
010707.cha	6	2
1;09	6	3
010907.cha	6	3
1;10	10	8
011020.cha	10	8
1;11	14	7
011100.cha	14	7
2;00	27	8
020010.cha	13	6
020028.cha	14	5
2;01	1	1
020115.cha	1	1
2;03	14	8
020314.cha	14	8

Table A.4 Total tokens and types produced by Gregorio in each recording

2;04	25	13
020429.cha	25	13
2;05	17	10
020513.cha	17	10
2;06	15	10
020613.cha	15	10
2;07	18	11
020700.cha	18	11
2;08	10	10
020800.cha	10	10
2;09	34	12
020906.cha	34	12
2;11	29	18
021109.cha	9	5
021114.cha	10	6
021120.cha	10	8
Total	226	59

MARCO		
Age/file	Tokens	Types
1;05	35	6
010504.cha	21	3
010518.cha	14	4
1;06	51	15
010602.cha	29	11
010622.cha	22	8
1;07	61	18
010706.cha	23	9
010719.cha	38	14
1;08	101	20
010803.cha	60	17
010817.cha	41	14
1;09	135	33
010901.cha	35	14
010915.cha	20	14
010929.cha	80	27
1;10	131	19
011012.cha	78	16
011026.cha	53	13

Table A.5 Total tokens and types produced by Marco in each recording

1;11	24	11
011116.cha	24	11
2;00	113	29
020000.cha	48	17
020014.cha	27	13
020027.cha	38	18
2;01	90	31
020111.cha	38	16
020127.cha	52	26
2;02	41	15
020211.cha	41	15
2;03	131	40
020302.cha	23	11
020315.cha	36	16
020329.cha	72	28
2;04	103	36
020413.cha	55	25
020426.cha	48	22
2;05	77	30
020510.cha	38	20
020524.cha	39	18
Total	1093	99

A.3 Adjective production

ELISA		Age of	Total
Adjective	Semantic type	first use	production
altro	altro	1;10	15
bello	value	1;10	12
malato	human propensity	1;10	1
moro	colour	1;10	1
piccolo	dimension	1;10	3
sporcato	physical property	1;10	1
uguale	modal	1;10	1
rosso	colour	1;11	1
bagnato	physical property	1;11	4
blu	colour	1;11	3
bravo	value	1;11	2
solo (foc)	solo	1;11	1
verde_blu	colour	1;11	1
verde	colour	1;11	3
grande	dimension	1;11	2
lesso	physical property	1;11	1
morbido	physical property	1;11	1

Table A.6 Adjectival lexical items in the speech of Elisa

		Age of	Total
Adjective	Semantic type	first use	production
bruciato	physical property	2;01	3
consumato	physical property	2;01	1
incartato	physical property	2;01	1
nuovo	age	2;01	2
pieno	dimension	2;01	1
pronto	stage-level	2;01	2
rotto	physical property	2;01	4
rovinato	physical property	2;01	2
stanco	human propensity	2;01	1
viola	colour	2;01	2
Types: 27			Tokens: 72

GREGORIO		Age of	Total
Adjective	Semantic type	first use	production
buono	value	1;07	4
brutto	value	1;07	10
sporco	physical property	1;07	2
alto	dimension	1;08	1
bello	value	1;08	21
finito	stage-level	1;08	1
grosso	dimension	1;08	2
rotto	physical property	1;08	2
acceso	classificatory, stage-level	1;09	3
altro	altro	1;09	8
bianco	colour	1;09	1

Table A.7 Adjectival lexical items in the speech of Gregorio

		Age of	Total
Adjective	Semantic type	first use	production
bravo	value	1;09	4
cattivo	value	1;09	2
coraggioso	human propensity	1;09	1
grande	dimension	1;09	3
malato	human propensity	1;09	3
forte	value	1;09	1
nero	colour	1;09	2
piccolo	dimension	1;10	3
rosso	colour	1;10	2
bagnato	physical property	1;10	4
morbido	physical property	2;00	1
povero	value	2;00	2

Types: 23

Tokens: 83

RAFFAELLO		Age of	Total
Adjective	Semantic type	first use	prod
bello	value	1;07	18
grande	dimension	1;07	10
brutto	value	1;09	32
duro	physical property	1;09	8
grosso	dimension	1;10	29
cattivo	value	1;10	17
fermo	human propensity	1;10	3
pronto	human, stage-level	1;10	2
zitto	human propensity	1;10	2
chiuso	physical property	1;10	1
ganzo	value	1;10	1
viaggiante	classificatory	1;10	1
altro	altro	1;11	7
rosso	colour	1;11	3
rotto	physical property	1;11	3
piccolo	dimension	2;00	10
freddo	physical property	2;00	5
lontano	dimension	2;03	1
scemo	value	2;03	1
lungo	dimension	2;04	7
bianco	colour	2;04	6
giallo	colour	2;04	5
alto	dimension	2;04	2
grigio	colour	2;04	2
scritto	physical property	2;04	2
colorato	result	2;04	1
dritto	human propensity	2;04	1
buono	physical property, value	2;05	3
biondo	colour	2;05	2
solo (foc)	solo	2;05	1

Table A.8 Adjectival lexical items in the speech of Raffaello

		Age of	Total
Adjective	Semantic type	first use	prod
pazzo	human propensity	2;05	1
sugo	nonce	2;05	1
arrabbiato	human propensity	2;06	2
ciucciato	physical property	2;06	1
stanco	human propensity	2;07	4
nero	colour	2;07	2
buio	physical property	2;07	1
cotto	physical property	2;07	1
pulito	physical property	2;07	1
avvelenato	classificatory	2;08	1
malato	human propensity	2;08	1
diverso	modal	2;08	1
felice	human propensity	2;08	1
mascalzone	value	2;08	1
agro	physical property	2;09	3
dolce	physical property, value	2;09	3
forte	human propensity	2;09	2
assicurato	result	2;09	1
attento	human propensity	2;09	1
blu	colour	2;11	2
contento	human propensity	2;11	1
coperto	physical property	2;11	1
ghiotto	human propensity	2;11	1
imprigionato	result	2;11	1
infame	value	2;11	1
malandrino	value	2;11	1
seduto	human propensity	2;11	1
tremenda	value	2;11	1
aperto	physical property	2;11	1

Types: 59

Tokens:

226

MARCO							
Adjective	Semantic type	Age of first use	Total prod	Adjective	Semantic type	Age of first use	Total prod
rosa	colour	1;05	23	pulito	physical property	2;00	1
verde	colour	1;05	57	scuro	colour	2;00	2
blu	colour	1;05	51	vero	value	2;00	4
rosso	colour	1;05	97	rotto	physical property	2;01	12
grande	dimension	1;05	116	attento	human propensity	2;01	1
piccolo	dimension	1;05	60	comprato	classificatory	2;01	2
brutto	value	1;06	49	disegnato	physical property	2;01	2
alto	dimension	1;06	6	giusto	value	2;01	2
bello	value	1;06	40	infernale	value	2;01	1
grosso	dimension	1;06	13	interessante	value	2;01	1
altro	altro	1;06	64	nudo	physical property	2;01	1
arancione	colour	1;06	44	sbagliato	value	2;01	1
giallo	colour	1;06	131	avvelenato	classificatory	2;02	1
solo (foc)	foc	1;06	18	buffo	value	2;02	5
tondo	shape	1;06	5	legato	physical property	2;02	3
grasso	dimension	1;06	1	aperto	stage-level	2;03	6
azzurro	colour	1;07	13	bagnato	physical property	2;03	1
carino	value	1;07	1	barucca	nonce	2;03	1
bianco	colour	1;07	44	bollente	physical property	2;03	2
nero	colour	1;07	40	chiuso	stage-level	2;03	5
leggero	physical property	1;07	1	coltivato	physical property	2;03	1
lontano	spatial	1;07	2	coperto	physical property	2;03	1
pronto	stage-level	1;07	6	crudo	physical property	2;03	1
sicuro	human propensity	1;08	1	duro	physical property	2;03	1
veloce	speed	1;08	4	fino	physical property	2;03	2
viola	colour	1;08	9	gonfiato	physical property	2;03	2
vuoto	dimension	1;08	2	gonfio	physical property	2;03	3
marrone	colour	1;08	19	risorto	physical property	2;03	1
buono	value	1;08	17	santo	value	2;03	1
lungo	dimension	1;09	9	sciocco	value	2;03	1
matto	human propensity	1;09	1	sgonfiato	physical property	2;03	1
maturo	physical property	1;09	1	sparato	result	2;03	1
nuovo	age	1;09	2	sportivo	classificatory	2;03	4
pieno	dimension	1;09	1	volante	classificatory	2;03	7
povero	value	1;09	4	corto	dimension	2;04	1
malato	physical property	1;09	1	gigantesco	dimension	2;04	2
sbucciato	physical property	1;09	1	intero	spatial	2;04	2
cattivo	value	1;09	15	magro	dimension	2;04	1
caldo	physical property	1;09	2	pesante	physical property	2;04	1
diverso	comparison	1;09	2	punteggiato	physical property	2;04	1
caro	value	1;09	1	solo	quantitative	2;04	1
dolce	value	1;09	3	stanco	physical property	2;04	2
bravo	value	1;10	3	forte	value	2;05	1
arrabbiato	human propensity	1;11	3	feroce	human propensity	2;05	1
attorcigliato	physical property	2;00	1	largo	dimension	2;05	2
birichino	value	2;00	2	seduto	stage-level	2;05	1
capace	human propensity	2;00	1	sveglio	stage-level	2;05	1
filante	classificatory	2;00	1	vecchio	age	2;05	1
finto	value	2;00	3	pecorino	classificatory	2;05	1
pitturato	physical property	2;00	1				
				Types: 99			
							Tokens: 1093

Table A.9 Adjectival lexical items in the speech of Marco

A.4 Semantic classes

ELISA					
Group	Semantic Class	1;10	1;11	2;01	Total
descriptive		4	15	20	39
	age			2	2
	colour	1	7	3	11
	dimension	1	2	3	6
	human propensity	1		1	2
	physical property	1	6	11	18
modal		4	10	1	15
	modal	1			1
	value	3	10	1	14
pre-card		5	5	6	16
	altro	5	4	6	15
	solo		1		1
stage-level				2	2
	stage-level			2	2
Total		13	30	29	72

Table A.10 Semantic classes per age in the speech of Elisa⁵⁸

GREGORIO							
Group	Semantic Class	1;07	1;08	1;09	1;10	2;00	Total
classificatory				2			2
	classificatory			2			2
descriptive		1	4	7	5	10	27
	colour			2	1	2	5
	dimension		2	2	2	3	9
	human propensity			3	1		4
	physical property	1	2		1	5	9
modal		3	11	13	1	16	44
	value	3	11	13	1	16	44
pre-card				5		3	8
	altro			5		3	8
stage-level			1	1			2
	Result			1			1
	stage-level		1				1
Total		4	16	28	6	29	83

Table A.11 Semantic classes per age in the speech of Gregorio⁵⁹

⁵⁸ Elisa produces 16 participles (7 types), all included in the *physical property* class. 1 at age 1;10, 4 at 1;11 and 11 at age 2;01.

⁵⁹ Gregorio produces 10 past participles, distributed in the following way: at age 1;08, 1 *physical property* and 1 *stage-level*; at 1;09, 2 *classificatory* and 1 *result* (all instances of the same lexical item: *acceso* 'on', which is classified in different ways due to contextual reasons); at 1;10, 1 *physical property*; at 2;00, 1 *physical property*.

RAFFAELLO																
Group	Semantic Class	1;07	1;09	1;10	1;11	2;00	2;01	2;03	2;04	2;05	2;06	2;07	2;08	2;09	2;11	Total
classificatory				1									1			2
	classificatory			1									1			2
descriptive		1	4	5	7	7		12	13	9	9	18	5	27	16	133
	colour				2				6	3	2	5			4	22
	dimension	1		1	2	1		10	3	4	4	9	1	20	3	59
	human propensity			3		2			1	1	1	1	4	3	6	22
	physical property		4	1	3	4		2	3	1	2	3		4	3	30
modal		5	2	3	6	20	1	2	11	6	4		4	2	12	78
	modal												1			1
	value	5	2	3	6	20	1	2	11	6	4		3	2	12	77
nonce										1						1
	nonce									1						1
pre-card					1					1	2			4		8
	altro				1							2		4		7
	solo									1						1
stage-level				1					1					1	1	4
	result								1					1	1	3
	stage-level			1												1
Total		6	6	10	14	27	1	14	25	17	15	18	10	34	29	226

Table A.12 Semantic classes per age in the speech of Raffaello⁶⁰

MARCO																
Group	Semantic Class	1;05	1;06	1;07	1;08	1;09	1;10	1;11	2;00	2;01	2;02	2;03	2;04	2;05	Total	
classificatory									1		1	9	1	2	14	
	classificatory								1		1	9	1	2	14	
descriptive		35	44	53	90	92	109	13	95	64	23	78	80	53	829	
	age					2								1	3	
	colour	28	27	41	61	66	76	10	75	44	7	46	31	19	531	
	dimension	7	14	11	28	19	33	2	15	17	10	6	39	23	224	
	human propensity				1	2		1	3	1	2	1	2	3	16	
	physical property			1		3			2	2	4	25	6	7	50	
	shape		3										2		5	
modal			4	2	7	32	15	10	11	17	10	18	14	14	154	
	modal					1			2	6		2		1	12	
	value		4	2	7	31	15	10	9	11	10	16	14	13	142	
nonce												1			1	
	nonce											1			1	
pre-card			3	5	3	7	7	1	5	7	7	22	7	8	82	
	altro		2	2	3	5	5	1	4	6	7	19	6	4	64	
	solo		1	3		2	2		1	1		3	1	4	18	
stage-level				1	1	4			1	2		3	1		13	
	result								1	2		3	1		7	
	stage-level			1	1	4									6	
Total		35	51	61	101	135	131	24	113	90	41	131	103	77	1093	

Table A.13 Semantic classes per age in the speech of Marco⁶¹

⁶⁰ Raffaello produces 16 past participles, distributed in the following way: at age 1;10, 1 *classificatory*; at 1;11, 1 *physical property*; at 2;04, 3 *physical property* and 1 *result*; at 2;05, 1 *physical property*; at 2;06, 1 *physical property* and 1 *human propensity*; at 2;07, 2 *physical property*; at 2;08, 1 *human propensity* and 1 *classificatory*; at 2;09, 1 *result*; at 2;11, 1 *human propensity*, 2 *physical property* and 1 *result*.

⁶¹ Marco produces 61 past participles, distributed in the following way: at age 1;09, 1 *physical property*; at 1;11, 1 *human propensity*, at 2;00, 2 *physical property*, 1 *classificatory* and 1 *result*; at 2;01, 1 *physical property*, 1 *modal*, 2 *result* and 1 *value*; at 2;02, 1 *physical property*, 1 *human propensity* and 1 *classificatory*; at 2;03, 1 *human propensity*, 18 *physical*

A.5 Syntactic position

ELISA					
Syntactic function	POSITION	1;10	1;11	2;01	Total
Isolation		3	7	1	11
	isolation	3	7	1	11
Predicative		3	12	16	31
	predicative	3	8	16	27
	exclamative		4		4
Adnominal		7	9	12	28
	prenominal	6	3	6	15
	postnominal	1	4	5	10
	pronominal		2	1	3
Unclear+Ambiguous			2		2
	unclear		2		2
Total		13	30	29	72

Table A.14 Syntactic positions of Elisa's adjectives⁶²

GREGORIO							
Syntactic function	POSITION	1;07	1;08	1;09	1;10	2;00	Total
Isolation		1	7	5	4	9	26
	isolation	1	7	5	4	9	26
Predicative			7	10	1	8	26
	predicative		6	10	1	3	20
	exclamative		1			5	6
Adnominal				9	1	7	17
	prenominal					3	3
	postnominal			4	1	2	7
	pronominal			5		2	7
Unclear+Ambiguous		3	2	4		5	14
	ambiguous	2	2	3		4	11
	unclear	1		1		1	3
Total		4	16	28	6	29	83

Table A.15 Syntactic positions of Gregorio's adjectives⁶³

property, 3 *result* and 1 *classificatory*; at 2;04, 6 *physical property* and 1 *result*; at 2;05, 1 *human propensity* and 3 *physical property*.

⁶² The past participles are found in the following positions: at age 1;10, 1 *predicative*; at 1;11, 1 *isolation* and 1 *predicative*; at 2;01, 11 *predicative*.

⁶³ The past participles are found in the following positions: at age 1;08, 2 *isolation* and 1 *predicative*; at 1;09, 2 *isolation* and 1 *ambiguous*; at 1;10, 1 *predicative*; at 2;00, 2 *isolation* and 1 *predicative*.

RAFFAELLO																
Syntactic function	POSITION	1;07	1;09	1;10	1;11	2;00	2;01	2;03	2;04	2;05	2;06	2;07	2;08	2;09	2;11	Total
Isolation		6	6	7	9	19	1	8	18	3	2	7	3	8	9	106
	isolation	6	6	7	9	19	1	8	18	3	2	7	3	8	9	106
Predicative				3	3	7		1	1	2	8	4	5	11	12	57
	predicative			3	3	7		1	1	2	8	4	5	11	12	57
Adnominal					1					11	4	7	2	12	7	44
	postnominal									7	1	5	1	4	4	22
	pronominal				1					4	3	2	1	8	3	22
Unclear+Ambiguous					1	1		5	6	1	1			3	1	19
	ambiguous				1	1		3	5						1	11
	unclear							2	1	1	1			3		8
Total		6	6	10	14	27	1	14	25	17	15	18	10	34	29	226

Table A.16 Syntactic positions of Raffaello's adjectives⁶⁴

MARCO																
Syntactic function	POSITION	1;05	1;06	1;07	1;08	1;09	1;10	1;11	2;00	2;01	2;02	2;03	2;04	2;05	Total	
Isolation		35	48	51	82	95	74	8	39	19	7	19	26	17	520	
	isolation	35	48	51	82	95	74	8	39	19	7	19	26	17	520	
Predicative			2	3	3	5	3	2	11	13	14	28	21	20	125	
	predicative		2	3	3	4	3	2	11	12	11	25	20	20	116	
	exclamative					1				1	3	3	1		9	
Adnominal			1	2	7	13	27	6	37	45	14	69	38	33	292	
	pronominal				1	2	5		2	2	3	12	8	4	39	
	postnominal				3	5	6	2	16	22	2	30	15	7	108	
	pronominal		1	2	3	6	16	4	18	21	9	27	15	22	144	
	postpronominal								1						1	
Unclear+Ambiguous				5	9	22	27	8	26	13	6	15	18	7	156	
	ambiguous			2	6	18	20	4	15	5	2	8	7	5	92	
	unclear			3	3	4	7	4	11	8	4	7	11	2	64	
Total		35	51	61	101	135	131	24	113	90	41	131	103	77	1093	

Table A.17 Syntactic positions of Marco's adjectives⁶⁵

⁶⁴ The past participles are found in the following positions: at age 1;10, 1 *isolation*; at 1;11, 1 *predicative*; at 2;04, 4 *isolation*; at 2;05, 1 *isolation*; at 2;06, 2 *predicative*; at 2;07, 1 *isolation* and 1 *postnominal*; at 2;08, 1 in *isolation*; at 2;09, 1 *isolation*; at 2;11 1 *isolation* and 3 *predicative*.

⁶⁵ The past participles are found in the following positions: at age 1,09, 1 *ambiguous*; at 1;11, 1 *isolation*; at 2;00, 2 *isolation*, 1 *predicative* and 1 *postnominal*; at 2;03, 13 *predicative*, 11 *postnominal*, 1 *pronominal*, 3 *ambiguous*, 1 *unclear*; at 2;04, 2 *isolation*, 2 *predicative* and 2 *postnominal*; at 2;05, 1 *isolation*, 6 *predicative* and 1 *unclear*.

A.6 Semantic class per position

ELISA AGE	POSITION	SEMANTIC CLASS										Total	
		altro	solo	modal	value	dimension	human propensity	physical property	age	colour	stage-level		
1;10	predicative			1			1	1				3	
	prenominal	5			1							6	
	postnominal					1						1	
1;11	predicative				4					4		8	
	exclamative				4							4	
	prenominal	3										3	
	postnominal					1			1		2	4	
	pronominal	1	1									2	
2;01	predicative					1	1		11		1	2	16
	prenominal	5				1							6
	postnominal					1				2	2		5
	pronominal	1											1
Total		15	1	1	9	5	2	17	2	5	2	59	

Table A.18 Semantic class of adjectives in predicative, exclamative, postnominal, prenominal and pronominal position in the speech of Elisa per month

GREGORIO AGE	POSITION	SEMANTIC CLASS							Total
		altro	value	dimension	human propensity	physical property	colour		
1;08	predicative		5					1	6
	exclamative		1						1
1;09	predicative		8				2		10
	postnominal		1	1				2	4
	pronominal	5							5
1;10	predicative							1	1
	postnominal								1
2;00	predicative		1					2	3
	exclamative		4					1	5
	prenominal	2	1						3
	postnominal			1					2
	pronominal	1	1						2
Total		8	22	2	2	5	4	43	

Table A.19 Semantic class of adjectives in predicative, exclamative, postnominal, prenominal and pronominal position in the speech of Gregorio per month

RAFFAELLO	AGE	POSITION	SEMANTIC CLASS				human propensity	physical			Total
			altro	solo	value	dimension		property	colour	nonce	
	1;10	predicative			1		2				3
	1;11	predicative						2	1		3
		pronominal	1								1
	2;00	predicative			6		1				7
	2;03	predicative				1					1
	2;04	predicative					1				1
	2;05	predicative			1	1					2
		postnominal			4	1	1			1	7
		pronominal		1	1				2		4
	2;06	predicative			3	2	1	2			8
		postnominal				1					1
		pronominal	2			1					3
	2;07	predicative				1	1	1	1		4
		postnominal				4		1			5
		pronominal				1			1		2
	2;08	predicative			2		3				5
		postnominal				1					1
		pronominal			1						1
	2;09	predicative				7	2	2			11
		postnominal				3	1				4
		pronominal	3		1	3		1			8
	2;11	predicative			2	1	5	2	1		12
		postnominal			1	1			2		4
		pronominal			3						3
	Total		6	1	26	29	18	11	8	1	101

Table A.20 Semantic class of adjectives in *predicative, exclamative, postnominal, prenominal* and *pronominal* position in the speech of Raffaello per month

MARCO	SEMANTIC CLASS														Total	
	AGE	POSITION	age	altro	value	colour	dimension	modal	human propensity	physical property	result	shape	solo	stage-level		classificatory
1;06	pred				1	1										2
	pronom											1				1
1;07	pred				2	1										3
	pronom											2				2
1;08	pred				1	2										3
	postnominal				1	2										3
	pronominal		1													1
1;09	pronom				3											3
	pred			1									3			4
	exclamative			1												1
	postnominal			1	2	2										5
1;10	pronominal			2												2
	pronom			2		12						2				16
	pred				2	1										3
	postnominal				6											6
1;11	pronominal			2												5
	pronom			2		3										6
	pred		1			3										4
2;00	pred			2	4	1		3	1							11
	postnominal			1	6	8									1	16
	pronominal		2													2
	pronom				14	2	1					1				18
2;01	pred			4	1	3	2		1	1						12
	exclamative			1												1
	postnominal			1	15	3	2			1						22
	pronominal		1				1									2
	pronom		4	1	14	1						1				21
2;02	pred			4		3		2	2							11
	exclamative			3												3
	postnominal				1	1										2
	pronominal		2	1												3
	pronom		4		4	1										9
2;03	pred			3	3	3	2		12	2						25
	exclamative			3												3
	postnominal		1	1	15	1		1	3	1					7	30
	pronominal		10	2												12
	pronom		7	2	10	1			4			3				27
2;04	pred			6	2	8		1	2							1
	exclamative			1												20
	postnominal				7	6			1	1						1
	pronominal		1	2		5										15
	pronom		2		6	6						1				8
2;05	pred	1		2	1	8		3	5							20
	postnominal				4	2	1									7
	pronominal		1	2		1										4
	pronom		2		12	3							4		1	22
	Total		1	46	49	156	79	9	10	31	6	1	15	3	10	416

Table A.21 Semantic class of adjectives in predicative, exclamative, postnominal, pronominal and pronominal position in the speech of Marco per month

The following tables show which lexical items appear in prenominal, postnominal and pronominal position in the speech of each child; they specify the age of first production and the total number of types in that position.

ELISA								
Prenominal adjectives	Age of first production	Total preN	Postnominal adjectives	Age of first production	Total postN	Pronominal adjectives	Age of first production	Total pronom
altro	1;10	13	piccolo	1;10	2	altro	1;11	2
bello	1;10	1	blu	1;11	1	solo (foc)	1;11	1
grande	2;01	1	lesso	1;11	1			
			verde	1;11	1			
			nuovo	2;01	2			
			pieno	2;01	1			
			viola	2;01	2			

Table A.22 Adnominal adjectives in the speech of Elisa.

GREGORIO								
Prenominal adjectives	Age of first production	Total preN	Postnominal adjectives	Age of first production	Total postN	Pronominal adjectives	Age of first production	Total pronom
altro	2;00	2	bello	1;09	1	altro	1;09	6
bello	2;00	1	bianco	1;09	1	bello	2;00	1
			grosso	1;09	1			
			nero	1;09	2			
			rosso	1;10	1			
			grande	2;00	1			

Table A.23 Adnominal adjectives in the speech of Gregorio.

RAFFAELLO								
Prenominal adjectives	Age of first production	Total preN	Postnominal adjectives	Age of first production	Total postN	Pronominal adjectives	Age of first production	Total pronom
-	-	-	cattivo	2;05	5	altro	1;11	6
			grosso	2;05	4	biondo	2;05	2
			pazzo	2;05	1	solo (foc)	2;05	1
			sugo	2;05	1	cattivo	2;05	2
			grande	2;06	2	piccolo	2;06	1
			alto	2;07	1	grosso	2;07	4
			piccolo	2;07	3	nero	2;07	1
			pulito	2;07	1	ganzo	2;08	1
			forte	2;09	1	buono	2;09	1
			lungo	2;09	1	dolce	2;09	1
			bianco	2;11	2	bello	2;11	1
						malandrino	2;11	1

Table A.24 Adnominal adjectives in the speech of Raffaello.

MARCO								
Prenominal adjectives	Age of first production	Total preN	Postnominal adjectives	Age of first production	Total postN	Pronominal adjectives	Age of first production	Total pronom
<u>altro</u>	1;08	20	<u>grande</u>	1;08	11	solo (foc)	1;06	15
dolce	1;09	2	<u>verde</u>	1;08	4	<u>giallo</u>	1;08	13
<u>piccolo</u>	1;10	3	<u>arancione</u>	1;09	7	<u>rosso</u>	1;08	14
<u>vero</u>	2;01	1	<u>bianco</u>	1;09	8	<u>altro</u>	1;09	25
brutto	2;02	1	cattivo	1;09	2	<u>nero</u>	1;09	7
<u>bello</u>	2;03	4	lungo	1;09	3	<u>verde</u>	1;10	11
santo	2;03	1	<u>blu</u>	1;10	1	<u>bianco</u>	1;10	6
<u>buono</u>	2;04	1	<u>giallo</u>	1;10	20	<u>blu</u>	1;10	11
<u>grosso</u>	2;04	5	<u>rosso</u>	1;10	6	marrone	1;10	3
<u>grande</u>	2;05	1	viola	1;11	1	<u>rosa</u>	1;10	2
			<u>piccolo</u>	2;00	5	viola	1;11	2
			filante	2;00	1	<u>piccolo</u>	2;00	5
			<u>nero</u>	2;00	8	<u>arancione</u>	2;00	9
			<u>vero</u>	2;01	2	<u>azzurro</u>	2;00	2
			alto	2;01	1	<u>vero</u>	2;00	1
			infernale	2;01	1	interessante	2;01	1
			<u>azzurro</u>	2;01	3	<u>grande</u>	2;01	9
			comprato	2;01	2	bagnato	2;03	1
			giusto	2;01	1	<u>bello</u>	2;03	1
			<u>grosso</u>	2;03	3	<u>buono</u>	2;03	1
			<u>altro</u>	2;03	1	gonfio	2;03	3
			<u>bello</u>	2;03	1	tondo	2;04	1
			bollente	2;03	2	sportivo	2;05	1
			coltivato	2;03	1			
			fino	2;03	1			
			volante	2;03	7			
			risorto	2;03	1			
			gigantesco	2;04	1			
			pesante	2;04	1			
			<u>rosa</u>	2;04	1			
			forte	2;05	1			

Table A.25 Adnominal adjectives in the speech of Marco

A.7 Type of noun

ELISA				
TYPE NOUN	1;10	1;11	2;01	Total
NCS	7	5	9	21
NCP		2	3	5
Total	7	7	12	26

Table A.26 Type of adjectivally-modified nouns across age (NCS=count singular, NCP=count plural) – Elisa

GREGORIO				
TYPE NOUN	1;09	1;10	2;00	Total
NCS	3	1	4	8
NM			1	1
NP	1			1
Total	4	1	5	10

Table A.27 Type of adjectivally-modified nouns across age (NCS=count singular, NM=mass, NP=proper name) – Gregorio

RAFFAELLO							
TYPE NOUN	2;05	2;06	2;07	2;08	2;09	2;11	Total
NCS	5	1	5	1	4	3	19
NCP	2					1	3
Total	7	1	5	1	4	4	22

Table A.28 Type of adjectivally-modified nouns across age (NCS=count singular, NCP=count plural) – Raffaello

MARCO											
TYPE NOUN	1;08	1;09	1;10	1;11	2;00	2;01	2;02	2;03	2;04	2;05	Total
NCS	4	7	10	1	15	15	3	31	16	8	110
NCP			1		3	5	2	7	4	3	25
NM				1		3		4	1		9
NP									1		1
Total	4	7	11	2	18	23	5	42	22	11	145

Table A.29 Type of adjectivally-modified nouns across age (NCS=count singular, NCP=count plural, NM=mass, NP=proper name) – Marco

A.8 Syntactic position of the DP

ELISA	DP position					Total
	arg		pred		prep	
	obj	adv	comp	subj	prep	
Age						
1;10	2	1	3	1		7
1;11			2		1	3
2;01	4		4	2		10
Total	6	1	9	3	1	20

Table A.26 Syntactic position of the DP – argumental, predicative and prepositional (Elisa)

GREGORIO	DP position			Total
	arg		pred	
	obj	PVsubj	comp	
Age				
1;09	1	1	2	4
2;00			2	2
Total	1	1	4	6

Table A.27 Syntactic position of the DP – argumental, predicative and prepositional (Gregorio)

RAFFAELLO	DP position					Total
	arg			pred	prep	
	obj	PVsubj	subj	comp	prep	
Age						
1;11				1		1
2;05		1	2			3
2;06	1				1	2
2;07	3			1	2	6
2;08				1		1
2;09	11			1		12
2;11	2		1	2	2	7
Total	17	1	3	6	5	32

Table A.28 Syntactic position of the DP – argumental, predicative and prepositional (Raffaello)

MARCO	DP position							Total
	arg				pred		prep	
	obj	PVsubj	subj	comp	excl	subj	prep	
Age								
1;08				1				1
1;09	2			1				3
1;10		1				1		2
1;11						1		1
2;00	6			1	1	2	6	16
2;01	7			2		7	4	20
2;02	2			3			2	7
2;03	8	2			2	9	5	26
2;04	8		1	3		1	4	17
2;05	2		1	5			6	14
Total	35	3	2	16	3	21	27	107

Table A.29 Syntactic position of the DP – argumental, predicative and prepositional (Marco)

A.9 Lexicalisation of the determiner

The following tables shows the lexicalisation of the determiner over age. LEX DET = lexicalised determiner, 0 DET = non-lexicalised determiner. The second-level rows show how many productions are *target* and *non-target* in the adult language.

ELISA DET	AGE			Total
	1;10	1;11	2;01	
LEX DET	7	9	12	28
target	7	9	12	28
Total	7	9	12	28

Table A.30 Lexicalisation of the determiner – Elisa

GREGORIO DET	AGE			Total
	1;09	1;10	2;00	
0 DET	3	1	2	6
non-target	1	1	1	3
target	2		1	3
LEX DET	6		5	11
target	6		5	11
Total	9	1	7	17

Table A.31 Lexicalisation of the determiner – Gregorio

RAFFAELLO DET	AGE							Total
	1;11	2;05	2;06	2;07	2;08	2;09	2;11	
0 DET		1	1	1			1	4
non-target		1	1	1				3
target							1	1
LEX DET	1	10	3	4	2	11	6	37
non-target		1						1
target	1	9	3	4	2	11	6	36
Total	1	11	4	5	2	11	7	41

Table A.32 Lexicalisation of the determiner – Raffaello

MARCO DET	AGE												Total
	1;06	1;07	1;08	1;09	1;10	1;11	2;00	2;01	2;02	2;03	2;04	2;05	
0 DET			2	4	8		7	3	4	13	6	3	50
non-target			2	4	8		6	1	2	8	3		34
target							1	2	2	5	3	3	16
LEX DET	1	2	5	8	19	4	25	42	9	54	29	30	228
non-target					1		2			3	1	1	8
target	1	2	5	8	18	4	23	42	9	51	28	29	220
Total	1	2	7	12	27	4	32	45	13	67	35	33	278

Table A.33 Lexicalisation of the determiner – Marco

References

- Abney, S. P. (1987). *The English noun phrase in its sentential aspect* (Doctoral Dissertation). Massachusetts Institute of Technology.
- Akhtar, N. (1999). Acquiring basic word order: Evidence for data-driving learning of syntactic structures. *Journal of Child Language*, 29, 677–686.
- Alexiadou, A. (2014). The syntax of adjectives. In A. Carnie, Y. Sato, & D. Siddiqi (Eds.), *The Routledge Handbook of Syntax* (pp. 107–125). New York: Routledge.
- Alexiadou, A., Haegeman, L., & Stavrou, M. (2007). *Noun phrase in the generative perspective*. Berlin, New York: Walter de Gruyter.
- Androutsopoulou, A., Español-Echevarría, M., & Prévost, P. (2008). On the Acquisition of the Prenominal Placement of Evaluative Adjectives in L2 Spanish. In J. Bruhn de Garavito & E. Valenzuela (Eds.), *Selected Proceedings of the 10th Hispanic Linguistics Symposium* (pp. 1–12). Retrieved from www.lingref.com, document #1781
- Antelmi, D. (1997). *La prima grammatica dell'italiano. Indagine longitudinale sull'acquisizione della morfosintassi italiana*. Bologna: Il Mulino.
- Barlassina, A. (2019). *The semantics of gradable adjectives in Italian: A study on their acquisition* (MA Thesis). University of Padua.
- Barner, D., Goodman, N. D., Schmidt, L., & Tenenbaum, J. B. (2009). *How Tall Is Tall? Compositionality, Statistics, and Gradable Adjectives*.
- Belletti, A., & Guasti, M. T. (2015). *The Acquisition of Italian: Morphosyntax and its interfaces in different modes of acquisition*. John Benjamins Publishing Company.

- Benincà, Paola, & Poletto, C. (2004). Topic, Focus, and V2: Defining the CP Sublayers. In *The Cartography of Syntactic Structures: Vol. 2. The structure of CP and IP* (pp. 52–75). New York: Oxford University Press.
- Berlin, B., & Kay, P. (1969). *Basic colour terms*. Berkeley and Los Angeles: University of California Press.
- Bernstein, J. B. (1993). *Topics in the Syntax of Nominal Structure across Romance* (Doctoral Dissertation). City University of New York.
- Bianchi, V. (1999). *Consequences of Antisymmetry: Headed Relative Clauses*. Berlin, New York: Walter de Gruyter.
- Blackwell, A. A. (2000). On the Acquisition of the Syntax of English Adjectives. *The Proceedings from the Panels of the Chicago Linguistics Society's Thirty-Sixth Meeting*, 36(2), 361–375.
- Blackwell, A. A. (2005). Acquiring the English adjective lexicon: Relationships with input properties and adjectival semantic typology. *Journal of Child Language*, 32(03), 535. <https://doi.org/10.1017/S0305000905006938>
- Boleda, G., Badia, T., & Batlle. (2004). Acquisition of Semantic Classes for Adjectives from Distributional Evidence. In *Proceedings of the 20th international conference on Computational Linguistics* (p. 1119). Association for Computational Linguistics.
- Cardinaletti, A., & Giusti, G. (2010). The Acquisition of Adjectival Ordering in Italian. In M. Anderssen, K. Bentzen, & M. Westergaard (Eds.), *Variation in the Input. Studies in the Acquisition of Word Order* (pp. 65–93). Dordrecht: Springer.
- Cardinaletti, A., & Giusti, G. (2015). Cartography and optional feature realization in the nominal expression. In U. Shlonsky (Ed.), *Beyond Functional Sequence*. New York: Oxford University Press.
- Cinque, G. (1994). On the evidence for partial N-movement in the Romance DP. *Paths towards Universal Grammar*, 85–110.

- Cinque, G. (Ed.). (2002). *Functional structure in DP and IP: The cartography of syntactic structures*. Oxford: Oxford Univ. Press.
- Cinque, G. (2005). Deriving Greenberg's Universal 20 and Its Exceptions. *Linguistic Inquiry*, 36(3), 315–332. <https://doi.org/10.1162/0024389054396917>
- Cinque, G. (2008). More on the indefinite character of the Head of restrictive relatives. In P. Benincà, F. Damonte, & N. Penello (Eds.), *Selected Proceedings of the 34th Incontro di Grammatica Generativa*. Padua: Unipress.
- Cinque, G. (2010). *The syntax of adjectives: A comparative study* (Vol. 57). Cambridge, Mass. - London, Eng: MIT press.
- Cinque, G. (2012). A generalization concerning DP--internal ellipsis. *IBERIA: An International Journal of Theoretical Linguistics*, 4(1), 174-193–193.
- Cinque, G. (2013). Word-Order Typology: A Change of Perspective. In T. Biberauer & M. Sheehan (Eds.), *Theoretical approaches to disharmonic word order* (pp. 47–73). Oxford: Oxford University Press.
- Cinque, G. (2014). The semantic classification of adjectives: A view from syntax. *Studies in Chinese Linguistics*, 35(1), 1–30.
- Cinque, G. (2015a). A note on 'other'. In *Charting the Landscape of Linguistics. Webschrift for Josef Bayer* (pp. 22–27). Retrieved from <https://iris.unive.it/handle/10278/3676173#.XPU2dYgzbIU>
- Cinque, G. (2015b). Augmentative, pejorative, diminutive and endearing heads in the extended nominal projection. In E. Di Domenico, C. Hamann, & S. Matteini (Eds.), *Structures, strategies and beyond. Studies in honour of Adriana Belletti*. John Benjamins Publishing Company.
- Cinque, G. (2017). A Microparametric Approach to the Head-Initial/Head-Final Parameter. *Linguistic Analysis*, 41, 309–366.

- Cinque, G., & Rizzi, L. (2010). The Cartography of Syntactic Structures. In B. Heine & H. Narrog (Eds.), *The Oxford Handbook of Linguistic Analysis* (pp. 51–65). Oxford: Oxford University Press.
- Cipriani, P., Pfanner, P., Chilosi, A., Cittadoni, L., Ciuti, A., Maccari, A., ... Veneziano, E. (1989). *Protocolli diagnostici e terapeutici nello sviluppo e nella patologia del linguaggio*. (1/84 Italian Ministry of Health): Stella Maris Foundation.
- Contemori, C., & Belletti, A. (2014). Relatives and passive object relatives in Italian-speaking children and adults: Intervention in production and comprehension. *Applied Psycholinguistics*, 35(6), 1021–1053.
- Corver, N. (1997). The internal syntax of the Dutch extended adjectival projection. *Natural Language & Linguistic Theory*, 15(2), 289–368.
- Culbertson, J., & Adger, D. (2014). Language learners privilege structured meaning over surface frequency. *Proceedings of the National Academy of Sciences*, 111(16), 5842–5847. <https://doi.org/10.1073/pnas.1320525111>
- Demonte, V. (2008). Meaning-form correlations and adjective position in Spanish. In L. McNally & C. Kennedy (Eds.), *Adjectives and adverbs: Syntax, semantics, and discourse* (pp. 71–100). Oxford ; New York: Oxford University Press.
- Dixon, R. M. W. (1982). Where have all the adjectives gone? In *Where have all the adjectives gone? And other essays in semantics and syntax*. Berlin, New York, Amsterdam: Mouton.
- Dixon, R. M. W. (2004). Adjective classes in typological perspective. In A. Y. Aikhenvald & R. M. W. Dixon (Eds.), *Adjective classes: A cross-linguistic typology* (pp. 1–49).
- Eisenbeiss, S. (2000). The acquisition of the Determiner Phrase in German child language. In M.-A. Friedemann & L. Rizzi (Eds.), *Acquisition of Syntax. Issues in comparative developmental linguistics*. London: Longman.

- Gallina, C. (2018). *L'acquisizione dell'articolo in bambini monolingui italiani studio di CHILDES* (Tesi di Laurea). Università degli studi di Padova.
- Gil, L. A., Eichler, N., Jansen, V., Patuto, M., & Müller, N. (n.d.). *The Syntax of Mixed DPs Containing an Adjective: Evidence from Bilingual German-Romance (French, Italian, Spanish) Children*. 17.
- Guasti, M. T. (2001). Il sintagma aggettivale. In L. Renzi, G. Salvi, & A. Cardinaletti (Eds.), *Grande grammatica italiana di consultazione: Vol. II. I sintagmi verbale, aggettivale, avverbiale. La subordinazione*. Bologna: Il Mulino.
- Hajek, J. (2004). Adjective classes: What can we conclude? In A. Y. Aikhenvald & R. M. W. Dixon (Eds.), *Adjective classes: A cross-linguistic typology* (pp. 348–361).
- Kayne, R. S. (1994). *The antisymmetry of syntax*. Cambridge, Mass.: Mit Press.
- Laenzlinger, C. (2005a). French adjective ordering: Perspectives on DP-internal movement types. *Lingua*, 115(5), 645–689. <https://doi.org/10.1016/j.lingua.2003.11.003>
- Laenzlinger, C. (2005b). Some notes on DP-internal movement. *GG@G*, 4, 227–260.
- Lee, R., Scontras, G., & Pearl, L. (2018). *How adjective ordering preferences develop in children*. Retrieved from www.socsci.uci.edu
- Longobardi, G. (1994). Reference and proper names: A theory of N-movement in syntax and logical form. *Linguistic Inquiry*, 609–665.
- MacWhinney, B. (2000). *The CHILDES Project: Tools for analyzing talk. Third Edition*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Marinis, T. (2003). *The Acquisition of the DP in Modern Greek*. In *Language Acquisition and Language Disorders: Vol. 31*. Amsterdam: John Benjamins Publishing Company.
- Marušič, F. L. (2011). *Reviewâ The Syntax of Adjectives: A Comparative Study*.

- Nicoladis, E., & Rhemtulla, M. (2006). Factors that Influence Children's Acquisition of Adjective-Noun Order. *Proceedings of the Annual Meeting of the Cognitive Science Society*, (28).
- Nicoladis, E., & Rhemtulla, M. (n.d.). Children's acquisition of word order depends on syntactic/semantic role: Evidence from adjective-noun order. *First Language*, 32(4), 479–493.
- Nocetti, S. (2015). Adjective Learning in English and Italian Children: A Comparison. In E. Tribushinina, M. D. Voeikova, & S. Nocetti (Eds.), *Semantics and Morphology of Early Adjectives in First Language Acquisition*. Newcastle upon Tyne: Cambridge Scholars Publishing.
- Panayidou, F. (2013). *(In)flexibility in Adjective Ordering* (Doctoral Dissertation). Queen Mary University of London, London.
- Ramaglia, F. (2008). Monadic vs. Polydefinite Modification: The case of Greek. *Stefano Canalis*, 162.
- Ramaglia, F. (2014). The syntax and semantics of attributive adjectives in Romance. *Lingue e Linguaggio*, (2/2014). <https://doi.org/10.1418/78405>
- Ramchand, G. (2018). Alternating adjectives. *The Linguistic Review*, 35(2), 283–306.
- Rizzi, L. (1993). Some notes on linguistic theory and language development: The case of root infinitives. *Language Acquisition*, 3, 371–393.
- Rizzi, L. (1997). The Fine Structure of the Left Periphery. In L. Haegeman (Ed.), *Elements of Grammar: Handbook of Generative Syntax* (pp. 281–337). Dordrecht: Kluwer.
- Rizzi, L. (2004a). Locality and Left Periphery. In A. Belletti (Ed.), *Structures and Beyond* (pp. 223–251). New York: Oxford University Press.
- Rizzi, L. (2004b). On the Cartography of Syntactic Structures. In L. Rizzi (Ed.), *The structure of CP and IP* (pp. 3–15). New York: Oxford University Press.

- Scontras, G., Degen, J., & Goodman, N. D. (2017). Subjectivity Predicts Adjective Ordering Preferences. *Open Mind: Discoveries in Cognitive Science*, 1(1), 53–65.
- Scott, G.-J. (2002). Stacked Adjectival Modification and the Structure of Nominal Phrases. In G. Cinque (Ed.), *Functional structure in DP and IP* (pp. 91–120). Oxford: Oxford Univ. Press.
- Sproat, R., & Shih, C. (1988). Prenominal adjectival ordering in English and Mandarin. *Proceedings of NELS*, 18, 465–489.
- Sproat, R., & Shih, C. (1991). The Cross-Linguistic Distribution of Adjective Ordering Restrictions. In C. Georgopoulos & R. Ishihara (Eds.), *Interdisciplinary Approaches to Language* (pp. 565–593).
- Svenonius, P. (1994). The structural location of the attributive adjective. *Proceedings of the 12th West Coast Conference on Formal Linguistics*, 439–454. CSLI Publications Stanford, CA.
- Svenonius, P. (2008). The position of adjectives and other phrasal modifiers in the decomposition of DP. In L. McNally & C. Kennedy (Eds.), *Adjectives and adverbs: Syntax, semantics, and discourse* (pp. 16–42). Oxford ; New York: Oxford University Press.
- Teodorescu, A. (2006). *Adjective Ordering Restrictions Revisited*. 399–407.
- Tomasello, M. (2000). Do young children have adult syntactic competence? *Cognition*, 74, 209–253.
- Tonelli, L., De Marco, A., Vollmann, R., & Dressler, W. U. (1998). Le prime fasi dell'acquisizione della morfologia. *Parallela* 6, 281–301.
- Tribushinina, E., van den Bergh, H., Ravid, D., Aksu-Koç, A., Kilani-Schoch, M., Korecky-Kröll, K., ... Gillis, S. (2014). Development of adjective frequencies across semantic classes: A growth curve analysis of child speech and child-directed speech. *Language, Interaction and Acquisition*, 5(2), 185–226. <https://doi.org/10.1075/lia.5.2.02tri>
- Tribushinina, E., Voelikova, M. D., & Noccetti, S. (2015). *Semantics and Morphology of Early Adjectives in First Language Acquisition*. Cambridge Scholars Publishing.

- Waxman, S. R., & Booth, A. E. (2001). Seeing Pink Elephants: Fourteen-Month-Olds' Interpretations of Novel Nouns and Adjectives. *Cognitive Psychology*, 43(3), 217–242. <https://doi.org/10.1006/cogp.2001.0764>
- Waxman, S. R., & Guasti, M. T. (2009). Nouns, Adjectives, and the Acquisition of Meaning: New Evidence from Italian-Acquiring Children. *Language Learning and Development*, 5(1), 50–68. <https://doi.org/10.1080/15475440802347528>
- Waxman, S. R., Senghas, A., & Benveniste, S. (1997). A cross-linguistic examination of the noun-category bias: Its existence and specificity in French- and Spanish-speaking preschool-aged children. *Cognitive Psychology*, 32(3), 183–218.