ABSTRACT

Title of Dissertation: WHAT DO CHILDREN HAVE IN THEIR HEADS? FUNCTIONAL HEADS AND PARAMETER SETTING IN CHILD LANGUAGE

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The aim of the present study is to revisit the old debate between rationalists and empiricists in relation to language development with new longitudinal data in hand. I show that when it comes to the development of a specific piece of linguistic knowledge, namely the distribution of the third person singular morpheme *–s* in child English, the generativist approach can satisfactorily account for the quirks observed in the longitudinal data presented herein. First, I argue that children are not conservative learners in the sense of Tomasello (2003), but they set parameters in the sense of Crain (1991). That is to say, child grammars may vary from the adult –significantly-, but the variation is conservatively limited by the hard-wired principles and parameters of Universal Grammar. I conclude that a parameter setting account of the development of functional categories is preferred as it attains explanatory adequacy with a minimal set of assumptions.

I then adopt Lasnik's (1995a) parametric account of verbal morphology, which distinguishes two types of Infl(ectional) items: affixal Infl and featural Infl. Furthermore, I use the same distinction to account for the development of sentential Neg(ation), as well, arguing that there are two parametric values associated with the Neg(ation) category: affixal Neg and featural Neg. In natural languages, the intersection of these values defines different grammars (e.g. Swedish vs. English, Middle English vs. Modern English). Based on the Principles and Parameter theory, I show that at any given point in development, innately hard-wired UG principles and parameters can accurately define child grammars the same way they define any natural language. I argue that longitudinal evidence suggests that these parametric values are hard wired as those options are explored by four different English-speaking 2-year-old children. Thus, I conclude that language development is better understood as language change driven by parameter setting and *re*-setting.

WHAT DO CHILDREN HAVE IN THEIR HEADS? FUNCTIONAL HEADS AND PARAMETER SETTING IN CHILD LANGUAGE

By

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To my two heroes: my Mom Velia and my Dad Mario (who left, with a piece of my heart).

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> *It is a curiosity of our intellectual history that cognitive structures developed by the mind are generally regarded and studied very differently from physical structures developed by the body.*
>
> Noam Chomsky, 1980a: 37

1.1 Introduction

At first, babies seem to be relative quiet people (as long as they are not crying). They do make some noises from time to time, but most of the time, they keep to themselves. Then, for a reason that still eludes people and linguists, they start talking. That is the end of the quieter time of childhood (and parenthood) and the beginning of this thesis.

One of the first things that strike people and linguists about children's earliest multi-word utterances is that these are not parroted versions of the adults' futile attempts to make them eat broccoli. Instead –and every caretaker would agree-, children's utterances show some systematic characteristics of the target, for instance, they are *semantically* coherent units, even though they are realized by *structurally* incomplete utterances. This observation and many other properties of child language make linguists and psychologists wonder whether children know more about their language than what they say or they know less. The answer varies. Substantially.

1.2 Generativism and Constructivism: theoretical claims

Children drop things. They drop food, their toys, and morphological items. English-speaking children tend to drop functional elements, generating (1) instead of (2); in (1) the morpheme –s is not produced. In the adult language, this morpheme carries agreement and tense information in the adult language; the verb agrees in person and number with the 3rd person singular subject. However, its absence from (1) cannot inform us whether children know what the element is or not. Especially, when (1) and (2) are produced alongside. Hence, the question here is whether children who produce (2) alongside (1) actually know that the morpheme –s is an instance of an inflectional category.

(1) The bear like the pizza

(2) The bear likes the pizza

There are two different views. Within the rationalist tradition, the Chomskyan view claims that children bring a considerable part of linguistic knowledge (or Universal Grammar) hard wired in their genetic code. In this view, the answer to the above is *yes*: children know the function and properties of inflectional items, from the start; something else makes them produce (1) along with (2).

A second approach to human cognition, framed within the Empiricist tradition, claims that children initially lack any formal linguistic knowledge, including knowledge of what constitutes a linguistic category. In this view, the

answer to the above is *no*: children do not know the properties of inflectional morphemes, because they need to build that knowledge first; (1) and (2) are the output of a system which is being built by means of generalized learning mechanisms.

1.3 The need to revise the theoretical models

The picture quickly gets complicated when we consider elicited production data that suggests that although children know the formal function of the morpheme *–s* (i.e. agreement), they do not know *where* it should be placed. For instance, 2 of the 4 children who participated in the study we conducted, produced sentences as in (3) in contexts where an adult would say (2). Here, the morpheme *–s* is dissociated from the lexical verb *like* and it surfaces in a higher position, between the subject and the verb[1].

(3) The bear s like the pizza

This morpheme also is found in negative sentences, as in (4), and in questions as in (5).

(4) The bear s not like the pizza

[1] Similar findings have been reported by Stromswold (1990) and Dye, Foley, Blumea, and Lust (2003).

(5) What s the puppet eat?

At first sight, one can observe that some of these children are capable of isolating the morpheme *–s* from the verb form and move it in predictable ways: the dissociated morpheme has a similar distribution as *does*/*do* in interrogatives and negative declaratives. Even in (6) below, we observe an unusual pattern, with an inflected verb form following the negative marker *not*.

(6) The bear not likes the pizza

We will see that while all these apparently random options are being used by the child, inflected *does* is conspicuously lacking from their sentences. Empiricists would consider all these examples as natural consequence of a gradually developing system that first chunks away communicatively symbolic units, and later grammaticalizes a pattern, giving rise to a (adult) grammar. The effects of this sophisticated pattern finding underlie the production of the non-adult examples, as well as the adult-like example. Initially, the child produces utterances that are based only on what the child hears and abstracts as a relevant *communicative* unit. That is, the examples above produced by a 2 year old possesses little linguistic abstraction. They can be considered as unanalyzed communicative units. Eventually, it will lead to the systematization of those initial patterns into a grammar, which can generalize patterns from previously unknown items and create novel messages. On this view, no latent principle waiting to mature is invoked to explain why children produce the non-adult

examples, they produce non-adult utterances because they have not yet learned all the patterns of use of the adult grammar.

Another way to interpret these new data is as supporting evidence for an underlying grammar; that is for a system of representations that determines the particular structures that children use. However, these data are unexpected under a Maturational account (Wexler 1994, 1998). The Maturational account argues that the inflectional category (i.e. IP) is innately specified, and it argues that not all the innate linguistic aspects are necessarily available to the child in the earliest stages. As a biological system, the linguistic component is also subject to maturation. That a certain innate principle is not mature (and thus accessible to the child) before age 3 would yield (1) alongside (2). In particular, Wexler (1998) argues for the early knowledge of the morphosyntactic properties of inflectional items and for a principle that needs to be relaxed. Eventually, the system will mature and that principle will go away. [2] However, the odd distribution of the morpheme in examples (3) through (5) cannot be accounted for in these terms: if children have the necessary inflectional knowledge, the affix *–s* should be an affix!

Another way to interpret these data is to consider the non-adult variations to reflect a different set of parametric values from the set that defines the adult English language. That is to say, we can take children's initial uncertainties to transpire from an underlying system that is ruled by universal principles that are

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[2] A detailed discussion of this particular approach will be presented in Chapter 2.

innately specified as well as *innately specified parametric choices* that have been fixed differently from the target language. The result is distinctive grammars that are very similar to English (at least vocabulary wise) but that differ from it parametrically (Chomsky 1993; Crain 1991; Crain and Pietroski 2002). One could argue that the presence of equivocal data (e.g. two different verb types: auxiliaries and lexical verbs with different morphosyntactic requirements) takes children down a parametric option that is partially compatible with the data, yet not quite (adult) Modern English. In this view, children have to flip parametric switches until they get the (nearest to) proper combination (cf. Hyams 1984, Chomsky 1965, 1981).

Maybe, children's mistakes are dialectal differences.

1.4 Dissertation aims and objectives

The general aim of the present study is to revisit the old debate between rationalists and empiricists in relation to language development with new longitudinal data in hand. I will show that when it comes to the development of a specific piece of linguistic knowledge, namely the distribution of the third person singular morpheme *–s* in child English, the generativist approach can satisfactorily account for the quirks observed in the longitudinal data presented herein. I will show that children are not *conservative learners* in the sense of Tomasello (2003), but they are *conservative parameter setters* in the sense of Crain (1991). That is to say, child grammars may vary from the adult –significantly-, but the variation is conservatively limited by the hard-wired principles and

parameters of Universal Grammar. Crucially, these children's hypotheses are not shaped by the input.

Furthermore, I will show that neither a maturation account nor a performance deficit can explain this set of data without invoking further conditions. Thus, I will conclude that a parameter setting account of the development of functional categories is preferred as it attains explanatory adequacy with a minimal set of assumptions.

I adopt Lasnik's (1995a) parametric account of verbal morphology, which distinguishes two types of Infl(ectional) items: affixal Infl and featural Infl. I will use the same distinction to account for the development of sentential Neg(ation), as well, arguing that there are two parametric values associated with the Neg(ation) category: affixal Neg and featural Neg. In natural languages, the intersection of these values defines different grammars (e.g. Swedish vs. English, Middle English vs. Modern English). Based on the Principles and Parameter theory, I will show that at any given point in development, innately hard-wired UG principles and parameters can accurately define child grammars the same way they define any natural language. Thus, I will conclude that language development is better understood as language change driven by parameter setting and *re*-setting. I will argue that longitudinal evidence suggests that these parametric values are hard wired as those options are explored by four different English-speaking 2-year-old children. Hopefully, by the end of this dissertation, I will make the reader aware that a child grammar is a unique synthesis of principles and parameters.

1.5 Organization of the study

I first discuss the main tenets of two opposing views of language acquisition: Generativism and Constructivism are presented in Chapter 2. Anticipating the results of the longitudinal study, I briefly evaluate the predictions of each account in the light of a new data set. In Chapter 3, I review some of the main proposals about the nature and mechanisms of inflectional merging that have led to Lasnik's (1995a) parametric account, namely, Chomsky 1993; Emonds 1976; Halle and Marantz 1993; Lasnik 1995a and Pollock 1989. Furthermore, I apply the parameter model of Infl to the properties of negation and propose a different way of looking at the properties of the negative markers *not* and *n't*, based in Lasnik's (1995a) hybrid analysis of Infl and which can be extended to other natural languages.

In Chapter 4, I present the data collected in a longitudinal study that studied the development of inflectional items in simple present tense contexts. I discuss the technical aspects of the longitudinal study and each child's individual linguistic profiles. I focus on two child grammar characteristics that the constructivist and the maturation approach to acquisition predicts: conservativity and early (adult) knowledge of morphological knowledge and show that the grammatical hypotheses children initially assume do not closely match the input or demonstrate early adult knowledge of the morphological associated with Neg and Infl.

In Chapters 5 and 6, I adopt the continuity approach (Crain 1991; Pinker 1984) and show that children's non-adult forms are consistent with properties

found in other natural languages. Finally, in Chapter 7, I suggest an alternative explanation for the OI stage, based on a parameter setting model. The chapter closes with a summary of this thesis.

2 Generativism vs. Constructivism

2.1 Introduction

In this chapter, I lay out the theoretical framework for my analysis of a new set of inflectional data collected longitudinally. The goal of this chapter is to provide a summary of what has been done towards the understanding of inflectional knowledge in child language, from the generativist and constructivist perspectives. The framework I lay out here is necessary to attain one of the goals of this dissertation: to provide further evidence for a parameter setting approach to language development as proposed in Chomsky 1993; Crain 1991; Crain and Thornton 1998; Hyams 1986).

In §2.2, I start by introducing the main issues to be discussed in the following chapters. Then, I look into two broad approaches to language and language acquisition: Generativism and Constructivism. In 2.3, I proceed to discuss the generativist approach to language acquisition, and in §2.3.6, three different models of language acquisition that are relevant for my study (namely, Wexler (1998), Phillips (1995) and Hyams (1984). For the Constructivist approach, I will discuss Tomasello's (2003) proposal of a constructivist model[3] in §2.4, and

[3] Tomasello (2003) uses the term *usage-based model*. But for the sake of consistency I will refer to the model as the constructivist model throughout.

in §2.4.5, I present two constructivist studies of inflectional knowledge in child language (namely, Theakston, Lieven and Tomasello (2003) and Wilson (2003)).

Towards the end of this chapter, in §2.6, I briefly anticipate the results of a longitudinal study, and I evaluate the predictions of each account in the light of a new data set. I will conclude that the current explanations for the development of inflectional knowledge are not sufficient to account for the results found in this new longitudinal study without further assumptions. I will tentatively claim that a parameter setting perspective offers an optimal and natural explanation for the early knowledge of functional categories (Infl and Neg), as opposed to the maturation and performance approaches, or the constructivist view.

2.2 Optional infinitives in child language

Wexler (1994) observes that English children go through the optional infinitive (OI) stage in which morphological items (e.g. 3rd person singular verbal morpheme –s and past tense –ed) are sometimes omitted from child representations, resulting in matrix sentences with uninflected verbs. In English, simple present and past tense is realized by a reduced number of morphemes, *-s* for present third person singular[4] and *-ed* for past tense. When multi-word

[4] It is open to debate whether the 3rd person singular –s is a tense morpheme, an agreement morpheme or both. Different theories have been formulated in this regard. I will review them briefly in the next chapter. I will assume that –s is exclusively an agreement morpheme, with present tense being realized exclusively by a zero or null morpheme. This distinction is not crucial for this discussion and so I will ignore the issue for now.

utterances containing verbs are first produced, around age 2 and until age 3, these morphemes are not consistently produced by English-speaking children. Children optionally omit –s and –ed, uttering (7) instead.

(7) Daddy drink milk

The issue is obscured in English by the scarcity of morphology: unlike other Germanic languages in which the finite/non-finite distinction is reflected not only structurally but also morphologically, English shows very reduced morphological contrasts. Thus, it is not clear when a child utters (7)whether the verb form is inflected or not. If it is inflected, the child is using the wrong morphology suggesting that she might be randomly using one of two forms (one with *-s* and one without). If it is not inflected, then the child lacks the requirement that would render (7) ungrammatical (as it is in the adult grammar).

Several studies on inflectional development in English-speaking children have confirmed that children's morphological knowledge, when it is realized, is *adult-like*. Notably, Poeppel and Wexler (1993) showed that the number of omissions is much higher than agreement mistakes, which are almost non-existent. If children did not know the function and distribution of verb markers, incorrect agreement use should also be expected. Harris and Wexler (1996) also showed that English-speaking children exhibited early morphological knowledge by looking at the production of sentential negation in child English. Assuming that children knew the morphosyntactic distribution of agreement and tense, they hypothesized that the agreement morpheme would never follow the

negative marker *not* (8)a. On the assumption that verbs with weak features move covertly to I at LF, raising *fits* would violated the Head Movement Constraint (Travis 1984), or the Empty Category Principle. The ECP requires that a trace be properly governed. However,in (8)a, negation blocks antecedent government for t_i.

(8) a. *He not fits

b. *He $fits_I$ not t_I (at LF)

They studied the files of 10 children from the CHILDES database, with ages ranging from 1;6 to 4;1 and from a total number of 1428 simple tense utterances, they found that of the 52 negative utterances produced with no or not, only 5 were inflected verbs following a negative marker.

Thus, quantitative studies show that children demonstrate early knowledge of the distribution of certain morphological items. When children produce morphology, they use it correctly. But what causes children to *not* produce morphology? That is the missing piece of the puzzle. As we are going to see next, many models can provide a piece to fit.

2.3 The Innatist Approach to Language Acquisition

To know a language is to know the (complex system of) *rules* of the grammar that generate all and only all the sentences of that language. The task of a language learner is to determine the set of rules of her linguistic community.

2.3.1 Modularity

The common sense answer is to say that the system of rules arises by an associative procedure as the child interacts with external stimuli (cf. Skinner, 1957). We hear a string of words, we repeat them, the connection is strengthened, and so we learn. In these terms, knowledge of language directly reflects our experience with language.

This common sense view has been repeatedly questioned by the Chomskyan generativist approach to language (see Chomsky (1964) for a detailed criticism of Skinner's theory of language behavior). The systematic study of language systems started by Chomsky (1955) has demonstrated that knowledge of language is more than a reflection of experience, and has advanced the idea that language is an encapsulated cognitive module (Fodor 1983) with its own system of rules and representations.

One of the central characteristics of the innatist enterprise is the adoption of Fodor's (1983) modularity of the mind. According to Fodor (1983), the various areas of human cognition are encapsulated domains (a theory which can also be extended to animal cognition). Each module or domain computes only certain stimuli or data, and it is impenetrable to data that do not pertain to its inner representations, "even if those data are relevant to the task" (see Gallistel (1990) for a perspective on animal and human cognition).

The language module can be described as an encapsulated module, only sensitive to linguistic data and ready to process linguistic stimuli[5] according to its own inner computations. Then, the task of acquiring a language can be understood as the process by which this module tunes in to the linguistic input.

2.3.2 Innateness and Universality

Every child that grows in normal conditions comes to speak the language of her linguistic community, quickly and successfully, without formal teaching or drilling. The effortlessness and faultlessness of the acquisition process does not match up to the characteristics of other skills that do require some drilling (e.g. basic arithmetic, playing a piano, learning your manners at the table, etc.), but it matches up to the determinacy of many encapsulated cognitive modules such as the visual system, the circulatory system or navigation systems.

It is largely undisputed that the visual, circulatory or navigational systems are genetically determined. Generativists argue that language acquisition proceeds rapidly and in a (relatively) error-free manner because many of the abstract linguistic properties attributed to human grammars are hard wired in the human genetic make up. Moreover, they are hard wired in just one cognitive module: the language module. Besides language specific points (associated with

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[5] This view does not deny the interaction of this module with other cognitive modules including, *a pragmatic module, motor-sensory* and *intentional/conceptual modules.* See Crain and Thornton's (1998) the Modularity Matching Model for an account framed within Fodor's (1983) Modularity.

aspects that vary parametrically from language to language), the language mental organ is fully in place by the time we are born. Thus, any human child is expected to acquire a language, guided by her language module.

2.3.3 Domain Specificity and the poverty of the stimulus

Assuming the UG theory (e.g. Chomsky, 1993) with its full range of abstract, and (hopefully) optimal properties, we cannot deny that there is a gap between what experience, i.e. positive linguistic data, makes available to the speaker and what the speaker needs to know in order to speak a language. This problem is known as the poverty of the stimulus argument. To acquire a language, a speaker cannot rely solely on experience.

Consider, for a moment, that language acquisition is a cumulative process of hypothesizing the best possible description for a given set of data. Children need information to confirm or discard a given hypothesis. Now imagine that a language L that can generate sentences {a, b, c} but not {d}, and that a child learning L hypothesizes a rule, which generates {a, b, c, and d}. Obviously, in this situation, the child's hypothesis is wrong. Can the child eliminate hypothesis A from her grammar? No, for the child has no reason to think that A is wrong, since she will be able to generate the set of the adult sentences. The child cannot eliminate hypothesis A unless she has a counter that makes note of the non-

production of {d}[6] or the child is corrected if she pronounces {d} (see Marcus 1993 for more on the absence of negative data).

Positive data can confirm a hypothesis but they cannot rule out incorrect hypotheses that are compatible with a subset of the data[7]. Take for instance, the derivation of a yes/no question as in (9)a: its derivation requires referring to the constituent structure of the utterance: the "auxiliary of the matrix sentence moves to the first position" as glossed in (10)a. This is known as *constituency dependency*, a constraint that human grammars abide by. But we could also think of a rule that does not refer to the structure of the sentence (hence structure-independent) as in (10)b, and avoid abstract and theory-internal complications. Both formulation types –structure-dependent as in (10)a, and structure-independent as in (10)b- can derive (9)a. However, (10)b can derive the ungrammatical (9)b. That is, formulating a description of the English grammar by using a structure-independent rule as (10)b fails to generate all and only all the permissible sentences. It overgenerates[8].

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[6] Adding a counter does not necessarily solves the problem for the child, as the child may then hypothesize B, which can generate {a, b, c, and e}, where {e} is ungrammatical in L. It is clear that by age 3 or 4 children pretty much know what type of rules they can formulate, see footnote 8.

[7] See Lasnik and Uriagereka's (2002) reply to Pullum and Scholz's (2002) paper for a detailed, simple and well-addressed argument in favor of the Poverty of the Stimulus. See also Chomsky (1980, 1986) for more discussion of the Poverty of the Stimulus argument.

[8] Crain and Nakayama (1987) conducted an elicited-production study to elicit yes/no questions from 3 to 5 year old children. Their objective was to test if children could use a structure-independent operation, and produce something like (9b) above. The results were compatible with the UG hypothesis, children never tried to apply a structure independent operation.

(9) a. Is the girl __ eating her cereal?

b. * Is the girl who __ eating her cereal is your sister?

(10) Formation rules (from Lasnik and Uriagereka 2002)

a. Front the matrix auxiliary

b. Front the first auxiliary

Not hearing (9)b cannot confirm or disconfirm either formulation. More importantly, not even *hearing* (9)a can confirm (10)a. Experience cannot inform a child of which linguistic hypotheses are not correct and which ones *are* correct. If the linguistic input does not provide sufficient evidence, how is the child to get an insight into the language specific properties? Learning to associate inputs can only drive the child to overgeneration in the syntactic domain, a property that child grammars lack. Thus, it can be reasonably concluded that advantage is given by an innate grammar module.

In conclusion, in the absence of negative data, or fully informative positive data, the knowledge necessary to bridge the gap between experience and the complexity of language must be innate and specific to language (in the sense that its principles must make reference to properties exclusive of that module, e.g. structure-dependency).

2.3.4 Principles and Parameters

Universal grammar is the theory of the initial state S^0 of human linguistic knowledge, which is described as a set of *principles* and *parameters*. Principles are usually understood in terms of constraints or negative statements about how human language is organized (Lasnik 1991). For instance, take the *structure dependency* principle. It bans movement in a fashion that ignores the phrasal structure of the sentence. This principle restricts the way operations transform the structure of one sentence to derive another: transformations can only move X to a position immediately dominated by X.

Parameters, on the other hand, are those properties that vary from language to language. Following Borer (1984), parameters are limited options that refer to what formal features make up functional categories (Tense, Agreement, Complementizer, Determiners, etc.) and how those features are realized in every language (morphological properties). For instance, all languages have wh-elements that are involved in the formation of wh-questions. However, languages vary on the position they realized wh-elements. English moves wh-elements in the syntax (thus, movement is overt), whereas Chinese does it at LF (thus, movement is covert), (see Huang, 1982). Thus, one can say that English and Chinese differ with respect to the value assigned to the functional category (i.e., Q) that triggers wh-movement: if it is strong, it will move in the syntax, otherwise it will move at LF (Chomsky 1991, 1993).

2.3.5 The Continuity hypothesis

Language development happens. Children go from babbling to asking where babies come from. Clearly, children are not born with their community's language specifics, even if we assume that much of the mental gymnastics needed to unveil the particular language code is innately specified, for children are not born speaking English, Japanese, or French. They need to acquire the specific parameters of their language. To capture the process of language change in childhood, generativists have proposed different models, placing the reason for development in the initial nature of UG itself, or in the properties of performance systems involved in language use, or in the process of parameter setting.

Several models of language acquisition subscribe to the Continuity assumption as in Crain (1991) and Pinker (1984):

> "Any rule system posited as a description of child language (…) should be the intermediate product of an acquisition mechanism that eventually converts that rule system into the adult system on the basis of parental input. Additional non-grammatical mechanisms should be independently motivated by the study of adults' and children's cognitive abilities (Pinker 1984:10)."

This is a strong assumption, which imposes stringent restrictions on the type of arguments we can use to explain child grammars, but which, at the end

of the day, may be explanatory satisfactory. As the reader may have anticipated, I embrace this view and argue that the evidence under consideration suggests that a theory that assumes the fewer differences between adults and children can successfully explain language change in early childhood.

2.3.6 Three models and one UG to rule them all

Of those models that adopt the continuity premise, one can distinguish between models that ascribe the developing nature of child grammars to: (a) the *maturation* of grammar principles according to a genetically-driven program, as discussed in Wexler (1994, 1998), (b) *performance* factors as in Phillips (1995) and (c) *parametric* choices (Hyams 1986).

2.3.6.1 Maturation of grammatical principles

The most recent theoretical account of the Optional Infinitive (OI) stage by Wexler is articulated in terms of the genetically driven maturation of some aspects of UG principles (Borer and Wexler 198x). To understand the production of infinitive verb forms in root clauses, he assumes (a) knowledge of morphological properties of INFL early on, (b) early parameter setting and, (c) a stringent constraint on feature checking (that allows the checking of only one D-feature on a functional category). That is, although children know the inflectional

properties and requirements of the INFL (i.e. Agr and Tns) category in English, an OI grammar can only license one functional category: Tns or Agr[9]. Consequently, one of these needs to delete, resulting in root sentences with an uninflected verb form.

However, children also produce (and interpret) finite sentences. As stated, the application of Unique Checking Constraint only results in the production of nonfinite root sentences. Something *else* allows OI grammars to generate a finite sentence. To give OI grammars their *optional* characteristic, Wexler (1998) proposes a computational principle: *Minimize Violations.* When UCC applies, either Tns or Agr have to delete in order to avoid a syntactic violation. On the other hand, the absence of a (deleted) Tns or Agr is a violation of the interpretative/conceptual component. Thus, (11) violates a syntactic constraint, while (12) violates an interpretative/conceptual property. Given *Minimize Violations,* these derivations are equal in that both have one violation: either one will be allowed in OI grammars.

(11) She eats cookies

(12) She eat cookies

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[9] Wexler's (1998) formulation of the Unique Checking Constraint is as follows:

(i) A D-feature on a DP can only check one D-feature on functional categories.

While UCC is active, the DP subject of a derivation, which contains Tns and Agr, both categories having an (uninterpretable) D feature respectively, can only check *one* of those D features on the functional categories. If the uninterpretable D feature of Tns or Agr is not checked, the deletion of that category ensues. The Unique Checking Constraint is a constraint only active in OI grammars. Eventually, child grammars grow and allow the derivation of adult-like representations: with UCC no longer active, both D features on Agr and Tns can be checked.

Although UCC generates representations that violate (adult) English grammar, OI English child grammars are still UG grammars, according to Wexler, since they function with a subset of UG principles, thus producing *convergent* derivations (see also Borer and Wexler 1992). However, UCC compatible representations carry the implication that OI grammars must find alternative ways of interpreting their derivations at LF. As argued in Enç (1987), tense[10] needs to be anchored by a proper binder *before* reaching LF. That is to say, to be able to receive an interpretation in LF, tense must find its binder. Wexler (1998), however, foresees this inconvenience but dismisses the possibility that a derivation with an unanchored tense is not convergent. For Wexler (1998), context fills the missing tense argument in OI grammars. At some point in children's development, the UCC matures, which in this case means that it becomes obsolete, and at this point, the child's grammar becomes adult-like. Hence, this approach expects the early knowledge of the morpho-phonological properties of inflectional items. As we will observe, data from our longitudinal study raises some doubts about this prediction.

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[10] According to Enç (1987), tense (located in INFL) is defined as a referential expression that denotes intervals. As for its anchoring conditions, in matrix sentences, tense must be bound by the matrix Comp, which denotes speech time.

2.3.6.2 Morphological access

A second type of model for the OI stage is represented in Phillips' (1995) careful analysis of a wide number of OI grammars. He presents a crosslinguistic analysis of the OI stage, using data the CHILDES database (McWhinney 2000), examining a wide range of child languages (German, Italian, Russian, French, English, Dutch, Swedish, Spanish and Hebrew). His analysis provides an account of root infinitives that rests on a competence-performance distinction and it goes as follows.

As in Poeppel & Wexler (1993) and Wexler (1994), Phillips(1995) also investigated children's morphological knowledge. Again, the conclusion is that their use of agreement, tense and case morphology is almost faultless. Across all those languages, children on occasion *omit* certain inflectional morphemes, but they do not *substitute*, for instance, a plural form for a singular form (and the observation extends to tense and case considerations as well).

Thus, Phillips (1995) suggests that the correct use of morphology is an indicator that children's morphological knowledge *is* adult-like, but that the use of morphological knowledge may be influenced by other factors, namely, the cost of accessing that knowledge component. He also points out that the decline in the use of nonfinite forms in matrix sentences is gradual and that the proportions of omissions vary according to the complexity of the paradigms in each language. Thus, for instance, Italian-speaking children (Italian being a morphologically rich language) produce a much lower number of matrix infinitives (Guasti 1992). English-speaking and Swedish-speaking children

(Platzack 1990), on the other hand, produce a higher proportion of matrix infinitives.

His explanation for OI grammars rests on a number of premises. First, he assumes that children have early morphological knowledge, a claim that has repeatedly been made (Poeppel and Wexler 1993; Harris and Wexler 1996; Stromswold 1992; see Phillips (1995) and references within). Second, he assumes that the syntactic component *can* be influenced by output components (see Crain and Thornton 1998 for arguments against this possibility). Knowledge of morphology and the invariant principles of grammar is granted by UG, but the access to (at least) morphological knowledge may be delayed by a lack of automatization in the process. That is, children's processing capacities determine whether the morphological spell out of inflectional features (which involves accessing the morphological items) is going to be more expensive that the avoidance of movement (e.g. V-to-I or V-to-C). For OI derivations, accessing morphology is more expensive than avoiding one derivational step.

Assuming that children's morphological access is not fully automatic, derivations that lack V-to-I movement are preferred as "the cost of spelling out inflectional features attached to verbs must be weighed against the cost involved in accessing the morphological spell-out of the inflectional process." For adults, access is costless since they have reached full automatization of morphological access. When the system automatizes morphological accessing, children *gradually* start realizing morphological endings more consistently.

To sum up, under Phillips' account, children's knowledge is adult-like (hence UG-based). UG and its parameters are available to the child from the

start, but performance factors conceal the underlying UG knowledge. This approach also expects children's morphological knowledge to be adult like when inflectional morphology is produced. In addition, as automatization of access increases gradually, the realization of morphological items consistently increases as well.

2.3.6.3 The parameter-setting model

Finally, let us discuss a third view on language development, which subscribes to the continuity assumption. The parameter-setting model takes forward the idea that UG is a system of invariant principles and parameters (Chomsky 1980, 1981, 1991, 1993, 1995) and applies it to language development. This approach to language variation is particularly interesting to the theory of acquisition. With variation restricted to the formal features of (a subset) of lexical items, the input does not need to be *too* informative, but simply sufficient.

Child grammars already have a specification of the invariant principles of UG; they just need information in the form of positive data to determine which set of parameters is operative in the adult system. To acquire a grammar, then, is to determine what parametric values are selected in the given language. The task of a child reduces to determining the "degree of variation in the PF component (…) Saussurean arbitrariness (association of concepts with phonological matrices), properties of grammatical formatives (inflection, etc.), and readily detectable properties that hold of lexical items generally (e.g., the head parameter) (Chomsky 1995b: 169)."

In many instances, however, the scarcity of the input will force children to select a hypothesis (or a parametric value) that will later be discarded based on further positive data (Hyams 1986, 1992; Crain and Thornton 1998). This implies that on occasion, children are not going to behave as conservative learners; on the contrary, the dynamics of parameter setting may lead children to adopt a hypothesis that is not a match with the adult grammar.

The empirical validity of this model rests on two predictions: that early grammars abide to the invariant principles of UG (Crain 1991, Crain and Pietroski 2002, Crain and Thornton 1998, Thornton 1990), and that early grammars can be accounted for in terms of those parameters defined in the UG theory. Some studies have concentrated in the study of the invariant principles of grammar (see Crain and Pietroski 2001 for an overview). Other studies have looked at the differences between adult and child grammars with respect to particular parameters. One of the first studies of parametric variation in child English was completed by Hyams (1986). There, she pursued parameter setting as an explanation for subject omission in child English. She suggested that the optionality in the realization of subjects in child English shared many characteristics with pro-drop languages (e.g. Italian). Hyams thus tied omission of subjects to the pro-drop option of the parameter in question. With this proposal, Hyams (1986) was able to capture other apparently unrelated characteristics of the early stages of child English: the absence of expletive subjects (i.e. *it*, *there*) and the absence of auxiliary *be*. Both properties can be explained under the parameter-setting model adopted in by Hyams (1986). Expletives are unavailable in adult pro-drop languages like Italian. This property

has been related to the nature of the agreement element in the Infl category in pro-drop languages: Agr is pronominal, excluding the possibility of overt lexical material appearing in [spec, IP]. Thus, it was argued that both properties were to be expected if children initially selected a pro-drop option.[11]

Thus, on this view, children mistakes are expected to fall within the delimited range of parametric variation postulated for other natural languages. Change is triggered by positive data. Of course, we need to leave room for some extrinsic conditions such as memory, attention and even paucity of the input that may delay the process of resetting.

I have reviewed three generativist models that assume the innateness of grammatical knowledge, and discussed how children can get from an initial –superficially incomplete- grammar to a full-fledged grammar. Independently of the model used to explain the developmental patterns attested in child speech, the hypothesis that the same system of knowledge, contained in the language module, is responsible for the verbal behavior in children and adults is confirmed by child data.

Next, I will review the constructivist model of language acquisition and review two recent constructivist studies of inflectional knowledge in child English.

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[11] See Hyams (1992) for reanalysis of her original proposal. Although she abandons the pro-drop parameter, she still frames her explanation in terms of the parameter-setting model.

2.4 The Constructivist approach to language acquisition

Constructivism (Culicover1999; Goldberg 1995) is an attempt to describe our knowledge of language by adopting a different set of linguistic primitives. Rather than appealing to abstract conditions (e.g. structure dependency), constructionists argue that grammars can be better described as a list of pairings between form (the linguistic input) and function (its communicative value). The way we combine a specific form with a specific communicative function gives rise to our knowledge of language, which is understood to be nothing else but a network of constructions.

From a developmental point of view, this approach argues that general learning mechanisms are sufficient to form abstract generalized patterns of language usage. Conceived as a list of constructions that range from a simple word to a complex sentence, a grammar is a collection of such constructions (in particular see Goldberg 2003 and Tomasello 2003) and so, they may all be acquired with a unique set of general learning techniques.

Embracing the assumption that there is no grammar beyond a list of language-particular structures, Tomasello (2003) suggests that the need of language particular rules is eliminated and with that, the poverty of the stimulus argument becomes moot. With no hard-wired UG, the ontogeny of language in children does not follow a genetically predetermined path. Instead, language is built by the application of innate general skills with children's particular experiences. Child languages thus gradually grow in the number of constructions and in the level of abstraction.

2.4.1 Constructions

The constructivist approach defines linguistic patterns as constructions whose form or function cannot be "strictly predictable from its component parts or from other constructions recognized to exist (Goldberg 2003: 219)." Each of the 'recognized' constructs is a grammatical primitive, whose linguistic meaning arises as the expressions that make them up are paired with specific semantic and discourse functions.

Syntactic structures can take different shapes and reach different levels of complexity; they include morphemes (*-ing*, *-ed*, *-s*, etc.), simple and complex words (*teach*, *blackboard*, etc.), idioms, phrasal patterns (VPs, NPs, etc.) and sentence types (intransitive sentences, transitive sentences, passive sentences, etc.).

Linguistic expressions can be complex in form. For instance, an intransitive expression, exemplified in (13), is a construct resulting from the combination of the simpler concrete constructs in (14) and the more abstract general patterns in (15), which -in turn- are made up of smaller constructs.

(13) [The bear is sleeping]

(14) *sleep*, *-ing*, *is*, *the*, *bear*

(15) [aux_{sg} V -ing], [det N_{sg}]

Another difference between generativist models and constructionist models is that the latter do not postulate levels of syntactic representation. For

generativists, a grammar is an algorithm that takes certain type of information (syntactic/formal features, or semantic features, or morphological features, or phonological features) and cycles it through different levels of representation, each of them yielding a different output that serves as input for the next level. Thus, generativists identify levels of representation that are sensitive to syntactic, semantic, morphological or phonological information. A derivation goes through a series of subsequent steps, each of them concerned with one of these levels of information. Each of them specifies their own constraints and thus each of them is sealed off from one another. Yet, there is a degree of interaction between these modules. To derive a phrase, each module generates an output that can serve as the input of the next one; before proceeding to the next step, the particular operations and constraints of each module can modify the input of the previous one and deliver it to the next module.

But for constructivism, there is a single level of representation, where phonological, syntactic and semantic constraints determine form and meaning. The structural description of a sentence arises from establishing a correspondence relation between forms and meanings.

2.4.2 Constructivism and language acquisition

For constructivist approaches to language acquisition, language is considered an emergent skill, as one of the multiple human specializations, and as the result of *cultural* learning. The same social and cognitive skills that are found to have role in developing other social behavior are called upon to

construct a grammar. Using a set of cognitive and social learning skills, a structured inventory of linguistic constructions emerges as their end-grammar. In this way, child language development is explained without resorting to innately specified conditions.

Tomasello (2003) lists the following socio-cognitive processes that aid the child to acquire not only a language, but also myriad of other social processes.

2.4.2.1 Intention-reading and cultural learning

Children need the ability to imitate the actions of others to be successfully integrated in the social activities. To able to communicate, children also need the ability to interpret and direct the intentions of others. These skills help the child to figure out the functional role of linguistic units: by trying to understand the communicative intention of certain behaviors (in our case, the uttering of a phrase to call somebody's attention), children learn to identify the functional components of a given structure.

2.4.2.2 Schematization

The initial regularities in children's speech involve the formation of semi-abstract schemas such as *I'm gonna X, he's gonna X, It X-s, what's X?* These schemas are strongly semantic in the sense that the constant elements are defined in terms of semantic roles such as the speaker's intention to do something. Thus,

in a schema such as *I'm gonna*, there is no *syntactic subject*, *verbal complement, inflectional head* or any other second order (metalinguistic) symbol.

2.4.2.3 Distributional analysis

This fundamental mechanism groups together lexical items (including phrases and sentences) with the same communicative function, to form the different linguistic categories.

2.4.2.4 Analogy

This ability helps children to categorize constructions according to the relation functions — syntactic roles— established in the situation. For instance, in a variety of syntactic constructions based on the schemas for *x love y* and *c loves m*, the same syntactic role can be identified: x is the lover, c is the lover and *love* represents that activity. And the same goes for any construction of the form X V-s Y: X and Y are the actors in the event or activity and V represents the event or activity.

2.4.2.5 Entrenchment and Preemption

In language development, the mechanisms described above allow children to generalize different degrees of patterns, but to avoid overgeneralization, we need other mechanisms to keep them in check. Thus, entrenchment and preemption work in tandem to prevent children from

overgeneralizing. On the one hand, via entrenchment, the more frequent constructions the child hears can easily become automatized: the more an item is heard the more it becomes habitual, and less likely to be eradicated from the system.

On the other hand, preemption works to subvert any overgeneralization that does not match the input. That is, if a child hears the construction X when she has hypothesized and expected to hear construction Y, construction X preempts construction Y. An unexpected construction "motivates the listener to search for that reason and so to distinguish the two forms [the child's hypothesis and the heard construction] and their appropriate communicative contexts (Tomasello 2003: 300)."

2.4.3 Conservative learners

For constructivists, constructing a grammar involves *learning* (i.e. committing the item to long term memory), *categorizing* the different elements that make up the language inventory, and *generalizing* this knowledge, in order to understand and generate novel structures. But it also requires that the child arrive at the *correct* set of generalizations that is shared with the rest of her linguistic community.

Early child English closely resembles adult English more than anything else (of course with some deviance). Word order is usually head first, their vocabulary items refer to more or less the same things as in the adult, etc. Obviously, children must be doing something correctly to become closer with the

surrounding grammar while not getting closer to Japanese or Burmese. With no internal metric (i.e. with nothing like an innate UG) to determine whether a generalization is permissible, the reliance on the input becomes fundamental in order not to get astray from the target grammar.

Thus, in addition to *preemption*, which blocks a hypothesized generalization when it encounters an input that contradicts the initial generalization, it is argued that children are initially *conservative* learners. As a hypothesis-testing tactic, children initially avoid making generalizations that are not granted by the input. Being a conservative learner in this perspective implies that the initial hypothesis will be very simple and tightly tied to the input. As Tomasello (2003: 176) puts it:

> "In the usage-based view, children mostly begin as conservative learners and gradually build up abstraction, so we should expect few overgeneralization errors early; such errors should begin only after a certain age –in the domain of syntax perhaps age 3 or so because that is when children show productivity with nonce verb experiments."

Thus, it should be expected that children's utterances will be as faithful to the input as possible (and giving out the false idea that they are regulated by underlying knowledge of grammar).

2.4.4 The role of input, and frequency of the input

According to constructionists, two characteristics of the input have an impact in the way children's representations appear to be structured: its frequency and its complexity.

As a consequence of the close dependency of children's utterances to the linguistic input, the most frequent items should facilitate the acquisition of the more complex structures as many of the more complex structures are made up of smaller items. For instance, a study by Cameron-Faulkner, Lieven and Tomasello (2003) reports that the most frequent items in the mother's speech of 12 English-speaking 2-year-old children were also those used by the children, in some cases almost at the same rate. Among the most frequent items mothers start their sentences, Cameron-Faulkner et al., 2003:863 found the following words: *What* (8.6%), *That* (5.3%), *It* (4.2%), *You* (3.1%), *Are*/*Aren't* (3.0%), *I* (2.9%), *Do*/*Does*/*Did*/*Don't* (2.9%), *Is* (2.3%), *Shall* (2.1%), *A* (1.7%), *Can*/*Can't* (1.7%), *Where* (1.6%), *There* (1.5%), *Who* (1.4%), *Come* (1.0%), *Look* (1.0%), and *Let's* (1.0%).

Once the child begins to categorize and automatize her earliest constructions (cf. Analogy and Distributional analysis above), preemption will further restrict potential hypotheses by allowing only those that match the input. Hence, rather than viewing the initial utterances as a reflex of a generative mechanism that is structuring the experience by imposing its pre-specified structure, the form of the input impinges its own structure on the learners' representations and generalizations aided by the several cognitive processes that are at work.

Several studies reported in Tomasello (1992, 2003) argue that around age 1 children start using intention-reading skills to engage in social interactions, which –in some cases- are mediated by language. Little by little, children discover the symbolic function of language and its pragmatic conditions and discover that certain linguistic symbols have certain effects on other's states of mind. These are the first pieces of their growing language knowledge, exemplified by one-word utterances or holophrases –unparsed adult expressions such as "Daddy", "all-gone", "wawa", "night-night", "where-it-go?" etc.-, pieces that do not have any internal structure as of yet. Over time, these linguistic representations "grow in strength and abstractness –on the basis of both the type and the token frequency (Tomasello 2003: 317)."

From the beginning, children may produce sentences that contain morphology, but as we said before, the earliest sentences are only produced as holophrases, with no internal syntax or meaningful morphological marking. However, at this stage children do not generalize across person types or other item-based frames. Thus, the utterances of a 2-year-old 'He eats cookies', and 'they eat cookies' are interpreted as deriving from two different frames, with no generalization across person, tense or modality types. Around the third year of age, children may start using word order and morphological cues more consistently in order to mark the participant's role in the event children want to describe. Moreover, they may begin to extend the frames to novel verbs (see Theakston, Lieven and Tomasello 2003 and discussion below). These signs of *productivity* and *flexibility* are interpreted by these constructivist analyses as the beginnings of the formation of functional categories such as agreement, tense,

etc. The important point is that emergence of language is to be understood as the gradual emergence of a skill, which starts off with very rudimentary tools and slowly but surely builds towards levels of complexity.

To sum up, functional categories like agreement, tense, etc. emerge gradually over time. Children's first linguistic generalizations are built around particular items (usually the most frequent lexical items), and not around morphemes. Once the socio-cognitive skills are in place (around children's first birthday), the learner's immediate task is to identify different kinds of constructs. They need to identify concrete expressions (words, word combinations, fixed phrases) and their semantic and discourse functions. With this as a base, children –active pattern-seekers- start extracting patterns from the input. With the constant influences of entrenchment and preemption processes, children's representation grow in strength and abstractness, until reaching the level of abstraction that allows them to learn, assimilate and adapt to new, novel structures.

2.4.5 Functionalist studies on inflectional development

2.4.5.1 Modeling the input in conservative learners

To demonstrate how *conservative* child grammars are, Theakston, Lieven and Tomasello (2003) investigated whether children's responses can be influenced by the type of input that children are exposed to. They suggest that the production of inflectional morphology reflects a verb-by-verb learning and not the underlying knowledge of the Infl category.

Theakston et al. argued that children's use of agreement marking (i.e. *–s*) with novel verbs was tied to individual verbs and dependent on the modeled input for that verb. They predicted that the use of the marker *–s* would be higher or lower depending on the type of input they received. That is, the authors reasoned that after hearing an unmarked verb, children would tend to produce the unmarked form, as it was the only model they received and that after hearing a marked form they would tend to produce the marked form.

They succeeded in showing that children were willing to generalize the use of the unmarked forms to contexts that required *marked* forms, supporting the idea that children generalize from the input and not from underlying knowledge. Interestingly, children did not do the reverse: they did not generalize the marked form to contexts that required an *unmarked* form (e.g. in questions).[12] That is to say, their data were also compatible with the generativist approach: children know the syntactic conditions for the distribution of inflected and uninflected verbs.

2.4.5.2 Gradual emergence of Infl

Wilson (2003) investigates if children 'learn inflection' by learning specific constructions. He argues that "children learn inflection (and by hypothesis, other functional categories) not by filling in language-particular information in pre-

[12] At this point, they considered the possibility that those children had already begun to form some sort of pivot construction

specified slots in an innate structure, but by learning some specific constructions involving particular lexical items (Wilson 2003:75)." On this view, inflectional knowledge reflected in the early constructions does not depend on an underlying *unitary* category (e.g. IP or TP, etc.), but it is constructed piecemeal. He wants to challenge the generativist conclusion that Infl, among other things, is hard wired in the human brain. He argues that if Infl is innately specified, then its emergence should be guaranteed in all the structures that require the projection of this category, more or less at the same time.

In his analysis of 5 CHILDES children's rates of realization of Infl in relation to the copula, auxiliary and simple present contexts, Wilson (2003) argues that INFL did not emerge as a unitary phenomenon. He analyzed three inflectional contexts: copula *be* (16), auxiliary *be* (17) and 3rd singular agreement *–s*, as in (18). If children have access to the properties of INFL from the start, their utterances should show similar rates of inflected forms across all the conditions.

(16) He is a doctor

(17) He is eating a cookie

(18) He eats cookies

However, the rate of inflection used by these 5 children were shown to vary significantly across those contexts. In line with the constructivist approach (Tomasello 1992, 2003; Cullicover 1999; Goldberg 1995), Wilson (2003) argues that INFL was not be used consistently across contexts in the early stages, the rates of production varied along the different contexts. Thus, he concludes that

children produced independent item-based constructions, which *happened to* contain a piece of inflection, but which for the child had no *syntactic* function.

On this view, omissions of inflectional morphology are explained as a "pared-down version of the adult model", where children have failed to apply the learned schema[13]. For instance, after hearing a large number of sentences like (18), a child learns a schema like in (19). Once she has that schema, then she can use it to produce (20), where the slot represented by NP_{obj} is filled. Out of all those utterances that the child hears, including yes/no questions, she may also learn the chunk of structure in (21) with the lexical item 'eat' (as opposed to the inflected form *eats*). Thus, according to this model, OI children learn two different item-specific schemata; one with the verb *eats* as the pivot and the other with the verb *eat*, yielding (20), (22) respectively.

(19) NP_{subj} EATS NP_{obj}

(20) He eats carrots

(21) NP_{subj} EAT NP_{obj}

(22) He eat cookies

(23) NP_{3psg} V-s_{3psg} NP_{obj}

[13]Wilson (2003) mainly focuses on the production and development of copula morpheme 'be' and the progressive auxiliary 'be'. Because of the topic of this thesis, I extend his proposals and predictions to 3rd singular present contexts, based on his discussion.

Although the representational structure of these schemata is different, (20) and (22) have similar *tense* meanings. For a period of time these constructions overlap in the child's speech; only later, does the child update these representations to include second order symbols such as agreement and inflectional information as in (23).

2.5 Summary: Continuity or Preemption?

In the preceding sections, I summarized two alternative explanations for the development of language in children. First, I presented the Generativist view, which offers a nativist solution: given the complexities of the human language knowledge, which are not directly derivable from the linguistic input, it is reasonable to conclude that language knowledge –i.e. Universal Grammar- is innately specified. Second, I discussed the Constructivist view, which argues that language knowledge is best described as an inventory of different construction types –with different degrees of abstraction- and that learning of these structures can proceed via general cognitive processes (such as analogy, categorization, distributional analysis, etc.).

At the early stages of language acquisition, the generativist approach considers that any child production reflects syntactic knowledge of some sort. But where generativists see syntactic knowledge (Hyams 1986; Phillips 1995; Wexler 1998), constructivists see item-based knowledge (Theakston et al. 2003; Wilson 2003).

One of the generativist examples put forward in favor of early (i.e. innate) functional categories in child language comes from the distribution of the inflected and uninflected verbs in child German. Poeppel and Wexler (1993) argued that children used of agreement, tense and case morphology almost faultlessly. Similarly, English-speaking children initially omit (some) of the morphological elements that realize inflectional information. For instance, the third person singular agreement morpheme *–s* in simple present sentences is frequently omitted by 2 year-old children in declarative sentences. Therefore, along with inflected verbs, children allow uninflected verbs to appear in declarative sentences as in (24).

Around age 3, children finally converge on the peculiarities of the English inflectional system and they reach adult-like performance, exclusively producing (25) (see Harris and Wexler 1996 for more details). What exactly gives (structural) convergence in the face of morphological omissions is a debatable question, even within the generativist camp.

(24) John eat apples every morning

(25) John eats apples every morning

On the other hand, recent studies within the constructivist approach (cf. Theakston, Lieven, and Tomasello, 2003; Wilson 2003) argue that the initial production of inflected forms do not necessarily reflect innate knowledge of a functional category, rather the data support the constructivists claims. They argue that the production of morphological items represents an *atomicized*

knowledge of item-specified frames. Although–to some extent- these frames have some *abstracted components* (e.g. [NP eats X] or [I eat X]) (with X representing a variable slot that can be replace by concrete items), the elements of the frame are not organized in terms of *abstract categories* (e.g. $[_{IP}\,[XP]_{subj}\,[_{I}\,\ldots[_{VP}\,V][YP]]]$) (where X, V and Y represent lexical categories).

As supporting evidence for their claims, constructivists argue that the production of novel verbal forms is conditioned by the type of input to which children are exposed. Thus, children tend to produce higher rates of inflected verbs after hearing an inflected form, and higher rates of uninflected verbs after hearing uninflected forms modeled in the input. It is argued that children's matching responses suggest the lack of inflectional knowledge (as understood in the generativist view). As children are conservative learners, they cannot extend whatever knowledge they have collected (i.e. their item-based knowledge) to new instances during the initial stages of grammar formation. Children keep their generalizations close to the input, and thus avoid overgeneralizations that would lead them astray. Older children, on the other hand, can extend their frames and generalizations to novel verbs and produce inflected forms –even when they are not exposed to the inflected form- given that they have reached the necessary level of abstraction. With the help of the preemption process, overgeneralizations are claimed to be kept in check.

2.6 New data from a longitudinal study

However, the data I introduce hereafter suggest quite the contrary. In the next sections, I present data that suggests that (a) children are *not conservative* learners, (b) children have non-adult knowledge of the morphological properties of inflectional items, (c) children's hypotheses reflect their *innate* linguistic knowledge which can be described in terms of the Principles and Parameter model of language (Chomsky 1995b, and references within).

Most of the studies on inflectional development are based on spontaneous production studies (e.g. CHILDES project, McWhinney 2000). Although they may extend over a large period of time, their disadvantage is that the data are not collected with a particular structure or hypothesis in mind. The problem with such naturalistic data is that if a given structure does not occur in the sample, it is often difficult to determine the cause of its absence. And even if it does occur, it is difficult to determine whether it is a productive construction type in the language of the child. The study reported in this thesis seeks to overcome the methodological shortcomings of studies that have relied on spontaneous production databases. Most of the studies on inflectional development that deal with the development of inflectional items have found that there is not a robust data set of the agreement morpheme *–s*.

Wilson (2003), for instance, investigated the production of overt inflection in present tense copular, present progressive and 3PSg agreement contexts in the speech files of five English-speaking children from the CHILDES database: Adam, Eve and Sarah (Brown 1973), Nina (Suppes 1974) and Naomi (Sachs 1983).

From the transcripts of these children, he reports a total number of 97,906 child utterances. Of those utterances, only 294 utterances contained the 3PSg agreement morpheme, which roughly represents a 0.3% of the total amount of utterances produced by these children.

One can take that small number of utterances with agreement to support the constructivist argument: since some inflectional items take longer to acquire than others, inflection is not necessarily innate. However, one can also wonder whether the (almost) absence of the morpheme derives from a methodological artifact. The pragmatic conditions for children to use this particular construction might have been rare, and consequently it was not properly sampled. This is not to deny that linguistic competence *is* the reason for the absence of this construction; the claim here is that nothing can be concluded until these methodological considerations are addressed.

Harris and Wexler (1996) faced a similar problem. The numbers seem to support Harris and Wexler's claim; only 9% of the utterances they studied had an inflected verb following a negative marker. But then again, one wonders whether that number is representative given that the instances of negation are low to begin with. The total number of negative sentences (inflected and uninflected), reported by Harris and Wexler, represents only 3% of the total number (the number of negative sentences with do-support are not reported in the study, however it is reasonable to think that the numbers may be low as well).

Two factors influence the production of negative sentences. One important methodological consideration comes from the pragmatic conditioning that regulates the use of negation in general. According to Russell (1948), a

positive statement has to be under consideration for a negative statement to be pragmatically appropriate. That is, one does not negate a statement, unless the positive counterpart is under consideration first. This pragmatic condition restricts the contexts in which a negative sentence can be produced. To elicit a negative sentence from a child, then it is necessary to submit to consideration a positive statement to provide the child with a pragmatic context to which the negative sentence can be anchored.

A second factor in the production of negative sentences is related to the reasons why a person negates a statement. Two reasons come to mind: the hearer disagrees with the speaker and second, the hearer wants to correct the statement made by the speaker. Thus, for a child to produce a negative sentence, the child needs to assume that the adult/speaker is somehow mistaken. These factors may induce a higher number of positive statements (if anything), as children may not want to correct adults in an experimental situation (even if it is just free play).

In the longitudinal study conducted in the Language Acquisition Lab at the University of Maryland, College Park, we combined the usual spontaneous production methodology with elicited production techniques. We tested 4 English-speaking toddlers from around their second birthday up to their third birthday. The addition of elicited production methodology resulted in a reliable longitudinal data set of affirmative and negative sentences in 3Psg contexts. Overall, the results do not confirm the constructivist predictions, or the maturational predictions.

The study includes data spanning over approximately a year for each child, starting at age 2. These children participated in experimental sessions in

which various elicited production techniques were used to elicit the structures under study.

Non-adult patterns are reliably attested in our data set. In (26), the verbal element carries a morpheme that indicates agreement between the subject and the predicate; adult grammars obligatorily produce this morpheme in this context. However, two of the subjects of our longitudinal study *consistently* produce utterances like (27) in the same contexts as (26), what an adult would say. Here, children produced an agreement morpheme in a non-canonical (i.e. non-adult) position, to no apparent communicative advantage or following any possible adult model.

(26) John likes these cookies

(27) John s like these cookies

In addition to declarative affirmative sentences, I analyze the distribution of this element in negative and interrogative contexts as well. Challenging previous generativist accounts, a great number of utterances with an inflected verb following a negative marker (e.g. (28)) were attested to different degrees in three out of four children. I also find another non-adult form that realizes the inflectional item in a dislocated position, and preceding negation as in (29) and (30) (in this case, these forms were produced to a lesser extent than the above form because only one child produces this form).

(28) The bear not fits in the train

(29) The bear s not fit in the train

(30) The bear s don't fit in the train

Regardless of the particular details that lie behind the production of these utterances, one thing is certain: neither the constructivist nor the maturation predictions can explain these examples. On the constructivist approach, children's productions should be close to the input, but as we can see in (27) through (30), they are not. On the Generativist approach, children's overgeneralizations should not violate principles of Universal Grammar. However, according to Harris and Wexler (1996), utterances (28), clearly violate the principle that regulates the distribution of traces in syntactic derivations.

2.7 Conclusions

We discussed the main tenets of two opposing views. The innatist view expects a certain continuity between the initial state of grammatical development and its final state as the module maps its own rules of organization onto the experience, resulting in a specialized linguistic module. On the other hand, the functionalist view expects a gradual development of linguistic knowledge. This knowledge gradually emerges from rudimentary item-based utterances with very few overgeneralization errors and eventually develops into a complex and sophisticated adult behavior with the help of entrenchment and preemption.

Towards the end of this chapter, I introduced child data on the development of inflectional items, and negative markers, obtained in a

longitudinal study of 4 English-speaking children. This study targeted the production of affirmative and negative utterances in the simple present and with 3rd person singular subjects. On the functionalist view, child utterances are expected to be closely tied to the input. However, we observe that some children can generate utterances that are slightly different from what the positive data makes available to the child. We found non-adult forms such as *he s fit*/*he fits* and *he s not fit*/ *he not fits*, along the grammatical adult forms *he fits*/*he doesn't fit* and the well-known Optional infinitive utterances that lack an agreement marker.

Although the implementation of more rigorous experimental techniques seems to bring up more problems than satisfactory results, I believe that the combination of elicited production techniques together with controlled elicited production experiments have the effect of opening up a bigger window into children's grammatical competence than when these techniques are used independently. My thesis is a first approach to understanding what we see through these children's windows.

In this thesis, I will seek to understand these child variations in generativist terms. More precisely, I will couch them in terms of the Principles and Parameter approach (Chomsky 1991, 1993; Chomsky and Lasnik 1993; Lasnik 1995a). I will argue that each of the variations attested in OI English child utterances are parametric variants of adult English; nothing more, nothing else. To that end, I next discuss the theoretical framework that I will use to describe early child English

3 Parametric Syntax: INFL and NEG

The task is now to show how the phenomena derived by the rule system can be deduced from the invariant principles of UG with parameters set in one of the permissible ways.
Noam Chomsky and Howard Lasnik, 1993.

3.1 Introduction

Agreement in natural languages is a complex phenomenon that establishes some sort a relation between two elements that match person, number, and gender. It is usually realized together with other inflectional morphology (tense, aspect, modality) in the Inflectional (Infl) head of the sentence. In English, subject-verb agreement is morphologically impoverished in that it is overtly realized by morphology in very few situations: Auxiliary (Aux) *be (am, are, is, was, were)*, Aux *have (has, have),* and the 3PSg morpheme *–s*.

Broadly speaking, the 3PSg agreement affix *–s* is one of the few *overt* inflectional verbal morphemes in the English language. It marks the presence of the subject of sentence that has third person singular features. The affix *–s* is a verbal suffix, it appears attached to a bare verb form in simple matrix sentences. It is phonologically realized by three different allophones, [–s], [–z] or [–ez], depending on the particular morphophonemic context.

The presence of negation markers disrupts the affix-verb relation and in this case the affix surfaces attached to the verbal element *do*. The verbal *do* form has no semantic specifications or any other function besides providing the affix with a host.

The agreement morpheme can appear in three different positions (a) attached to a verbal suffix within VP, (b) attached to an external host outside of VP position, and (c) attached to an external host in a verb-second (V2) position in interrogative contexts (Vikner 1995).[14]

Although there are many different accounts to explain the distribution and realization of this morpheme, all the accounts within the generative framework share Chomsky's (1957) insight that the morpheme *–s* (and this observations extends to past tense marker *–ed*) is a distinct syntactic unit in the deep structure, belonging to a category altogether different from verbs. The structural discontinuity of these two categories (viz. Agr and V) needs a theory for the triggering conditions of the operation that brings them together (i.e. merge).[15] In §3.2, I will review some of the main proposals about the nature and mechanisms involved in inflectional merging that have led to Lasnik's (1995a) parametric account, which I will adopt (Chomsky 1993; Emonds 1976; Halle and Marantz 1993; Lasnik 1995a; Pollock 1989). In §3.3, I will apply the parameter model of Infl to the properties of negation, another functional category which intervenes with the triggering conditions on merging, as briefly described in the

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[14] I will put aside any further discussion of interrogative contexts and other V2 contexts, and any developmental patterns in our data. However, the findings about the development of inflection and negation parametric properties are inherent to to the understanding of those involved in the V2 contexts I hereby set aside.

[15] Here, I am using the term *merge* to refer to whatever operation brings these two units together. At this point in the discussion, *merge* is used to refer to *syntactic* movement (Chomsky 1991; Emonds 1976; Pollock 1989) as well as *morphological* movement (Chomsky and Lasnik 1993; Lasnik 1995a; Embick and Noyer 2001; Halle and Marantz 1993). In the following subsections, I will address the differences between *morphological merge* and *syntactic movement* in detail.

introduction. I will propose a different way of looking at the properties of the negative markers *not* and *n't*, that is based on Lasnik's (1995a) hybrid analysis of Infl[16].

3.2 The syntax of Infl

The expression of agreement is mediated by the functional head Infl, the locus of agreement features and tense.[17] In this section, I will review the main theories that have been postulated to explain how the features contained in the Infl head relate to the lexical verb (or not, as in the case of negative contexts, where the affix does not attach to the verb stem).

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[16] The analysis I will present is not very different from Boskovic (2001). However, my analysis is not framed within Phase theory (Chomsky 2001), as is Boskovic's. I leave the possibility open for future research.

[17] Bobaljik and Thráinsson (1998) distinguish between languages that have a single Infl node (English, Mainland Scandinavian and one of two Faroese dialects) and languages that have a split Infl node, with Agr and Tns heading their own projections (e.g. Icelandic, Yiddish, Romance languages). The availability of extra structural positions predicts that Split-IP (SIP) languages may allow transitive expletive constructions, two object positions or two subject positions, verb movement in non-V2 contexts and the possibility of co-occurrence of tense and agreement morphemes. Thus, according to these criteria, English is a non-SIP language: Infl is a single node that contains Agr and Tns features. In turn, this classification implies that in English, Agr and Tns compete for the same position. Thus, I will assume that the morpheme *–s* is exclusively an agreement morpheme. I limit my discussion to this morpheme, leaving the study of the acquisition of the Tns morpheme *–ed* for future research).

3.2.1 Standard Theory: standard description

Emonds (1976) identifies the morpheme *–s* as a member of the category AUX (*C* in Chomsky (1957)). As an AUX (or –equally- Infl), the category has the following characteristics:

(a) It undergoes inversion in questions
(b) It is involved in the formation of tag questions
(c) It is involved in the reduction of *not* to *n't*
(d) It does not undergo deletion in VP ellipsis contexts

With these characteristics in mind, the other elements that belong to this category are easily identified: the past-tense affix *–ed*, auxiliaries (*be* and *have*) and modals (*can, could, shall,* etc.). According to Emonds (1976), then, AUX has two *deep structure* realizations: [+AUX, -TENSE] for *modals* and [+AUX, +TENSE] for *–s* and *–ed*. That is, *–s* is a *present* tense morpheme, as opposed to *–ed*, the *past* tense morpheme. Depending on the context (viz. interrogative, emphatic and negative contexts), the auxiliary form *do* is inserted (via a transformational operation), otherwise *–s* (or *–ed*) moves to the V position via affix movement, a transformational operation as well.

3.2.2 Split Inflection: Pollock (1989)

Late in the 1980's, crosslinguistic research resulted in an important shift from rules that refer to specific structures -e.g. *Wh*-fronting, Subject-Aux

inversion (Emonds 1976; Chomsky 1957; Jackendoff 1972, to name a few)- to simpler, and explanatory-adequate principles that are associated with parameters of variation (e.g. Move-α, where α is *wh*-). Verbal morphology, the usual suspect, was the target of Pollock's (1989) reanalysis of the nature of the verb-raising and the affix-movement operations proposed within the Standard Theory.

Pollock (1989) recasts the rule of verb raising (or the lack thereof) in questions and negative sentences as an instance of the UG general rule Move-α (Lasnik and Saito 1984), triggered by the need of licensing the morphology and binding a tense variable. He proposes that agreement and tense each head their own projection (the Split Infl Hypothesis). In his analysis, verb movement is mediated by the properties of the syntactic features of Agr(eement). He assumes that Agr is a category universally associated with one of two values: *transparent* Agr (e.g. French) or *opaque* Agr (e.g. English).

A *transparent* Agr allows the theta grid of the moved verbal element to be visible by the foot of the chain, an *opaque* Agr does not: a verb that moves to an opaque Agr cannot assign theta roles. Therefore, only verbs that lack a theta grid can move through an opaque Agr, without incurring in a violation of the Theta Criterion. This distinction permits the word order differences between auxiliary *be* and *have,* and lexical verbs to be parametrically explained too. Auxiliaries which lack a theta grid are free to move to an opaque Agr, whereas lexical verbs cannot.

For the tense operator to bind its variable in declarative sentences containing a lexical verb, an overt *do* (in the case of negative sentences) or a null *do* -∅ (in the case of affirmative sentences) is generated under Agr. Thus, it is *do* that moves from Agr to T and not the lexical verb. The raising operation yields the surface structure in (32). However, (32) is not the correct PF output. The amalgamate [T[Agr[-∅]] needs to move to its "lexical prop" –the verb *run–*, via Affix movement.

The presence of the NegP prevents the use of null *do* in negative sentences (which would yield ungrammatical *inflected medial negation*); Neg acts as a barrier for the proper government of the trace of Agr, which is required to be bound by a Tense operator. The application of verb raising is thus a consequence of a universal requirement that Tense is an operator that needs to bind an event-type variable (Pollock 1989: 392), "and the lexical content of the verb defining [the variable's] range of variation." Thus, in (31), +T binds a variable: the trace of the verb and Agr.

(31) [John [$_{T}$[$_{Agr}$[hav-$_{i}$]Agr] +T] [$_{NEGP}$ not [$_{AGRP}$ e$_{i}$ [$_{VP}$e$_{i}$ [$_{VP}$ decided yet]]]

(32) [John [$_{T}$[$_{Agr}$[-∅$_{i}$] Agr]T][$_{AgrP}$ e$_{i}$ [$_{VP}$ run daily]]]

(33) [John [$_{T}$[$_{Agr}$[*do$_{i}$*] Agr]T] [$_{NegP}$ not [$_{AgrP}$ e$_{i}$ [$_{VP}$ run daily]]]]

Pollock (1989) implements a division of work between *morphological* morphemes (i.e. affixes) and *abstract* morphemes (syntactic features), with a one to one correspondence. In this framework, the abstract morphemes undergo

syntactic operations to form a complex head; the resulting complex head –if properly abiding to UG principles– is overtly realized in the PF component. As the verb (i.e. *do* or *null do*) moves through the Agr head, it *amalgamates* with the agreement features in order to become overt. In other words, verbal morphology drives syntactic derivation by moving corresponding syntactic features. The result of this *syntactic* merge is realized by *–s* in 3rd present singular contexts, and as -∅ (zero morpheme) for the other person contrasts. Therefore, the *distribution* is determined by moving the corresponding pieces: verb movement (moving overt *do* in negative sentences) or affix movement (moving null *do* in affirmative declarative sentences). Hence, Affix movement is looked on as a well-formedness transformation, which applies in order to generate a morphologically correct verb form (cf. Lasnik's (1981) ban on stranded affixes).

3.2.3 Strong Lexicalism: Chomsky (1993)

A third way of looking at the derivation of verbal morphology is elaborated in Chomsky (1993), where it is claimed that inflectional morphology is not derived by transformations in the syntax (as in Chomsky 1955, 1965, 1991). Instead, the verb is inserted in the derivation with all the inflectional morphology already attached to the verb. In the derivation, the verb *checks* its morphology against the abstract features that project the corresponding functional categories. The morpheme *–s* is no longer an autonomous syntactic entity (AUX) as initially proposed in Chomsky (1957); the formal abstract features are autonomous entities, with morphological requirements of their own. For Chomsky, the

abstract morphemes are morphological properties that trigger syntactic movement as a way of satisfying those properties. Thus, the question is no longer how the verb comes to bear inflectional morphology in English as opposed to French or, say, Catalan. The question now is *when* in the derivation the morphological requirements of the functional heads are satisfied. On this approach, the features that are carried by the verb are checked against the features of the inflectional heads at some point in the derivation, with LF movement (i.e. movement that applies post-syntactically) being preferred over overt movement (i.e. movement that applies in the syntax).

For English, Chomsky argues that verbal features are weak, and as such, they are invisible to PF. Consequently, checking these features can be postponed until LF (Procrastinate) because the unchecked weak features do not make the derivation crash at PF.

Chomsky's approach to inflectional morphology differs from the standard theory analysis in that agreement features (person, number and –optionally- gender or phi-features) have two different loci: (a) the features carried by the already inflected verb, (b) the (attracting) features of the functional heads (Agr, Tense)[18]. It takes a step further the division of labor implemented by Pollock (1989). Pollock distinguishes between abstract morphemes heading their own projections and the actual agreement morpheme *–s*. While still maintaining the

[18] Of course, there is a third locus of agreement information as the subject also carries agreement features, which will enter in a relation with the verbal features. I leave this relation aside.

syntactic independence of the overt morpheme as in Chomsky (1957), the presence of the abstract features is determined by virtue of the presence of the morpheme. Chomsky (1993), on the other hand, adopts a stricter lexicalist view, giving up the independence of the overt morpheme, but conferring on abstract features the status of fully-fledged grammatical entities. In this case, the presence of the abstract features is determined by UG as units independent of the actual inflectional morphemes: Agr is just a bundle of abstract features that check against features of a fully inflected verb that rises to them. However, this account raises some problems for the analysis of (34). As discussed in Lasnik (1995a) at length, Chomsky's analysis does not provide an account for (34), where the verb has raised to Infl at LF.

(34) *George not reads foreign newspapers

3.2.4 Distributed Morphology: Halle and Marantz (1993)

Another way of analyzing inflectional morphology and how the verb comes to be inflected is proposed by Halle and Marantz (1993) who argue that agreement in natural languages is a post-syntactic phenomenon, related to well-formedness conditions rather than to syntactic requirements. Different points separate this view from the various transformational accounts discussed previously.

Contrary to the model presented in Chomsky (1993), for Halle and Marantz, word formation processes (i.e. derivational and inflectional processes)

apply at distinct syntactic, morphological and phonological levels. Whereas in Chomsky's feature checking model the verb checks its inflectional features against abstract inflectional items, Distributed Morphology assembles words (understood as "complex syntactic heads" (Halle and Marantz 1993:112) throughout different stages including the syntactic component, MS and the phonological component. The syntactic component works with bundles of syntactic and semantic features, with morpho-phonological information only added in the Morphological Structure (MS), an independent level of representation, with its own principles and constraints.

Morpho-syntactically, a word consists of a root and a set of formal features. For instance, the inflected verb *working* is a complex word that consists of two elements (cf. (35)): a root $\sqrt{F}_{[+...]}$, which consists in a bundle of semantic features (e.g [+ activity]) that define its lexical meaning, and the morpheme [+progressive], which identifies a set of formal features. √F is an atomic unit, unspecified for category, which needs to be combined with bundles of functional features to yield either a verb or a noun.[19]

[19] Lexical categories (e.g. Verb, Noun) are derivative. In essence, the category of a lexical item is determined by the grammatical features that are eventually merged to the root. For instance, the root √WORK combines with the feature [+progressive] in our example above; this particular context identifies the root as a verb.

(35) a. $[_{VP}[\sqrt{F}_{+activity,+etc.}]$ [+ progressive]…] D-Structure

b. $[_{VP}[\sqrt{F}_{+activity,+etc.}]$ <*merge*> [+ progressive]…] Merge

c. $[_{VP}[\sqrt{F}_{+activity,+etc.}]$ [+progressive] S-Structure

d. /working/ vocabulary insertion at MS

The syntactic component applies different grammatical operations that include head-to-head movement (e.g auxiliary raising), merger of syntactic heads, etc. (cf. (35) b). At MS, further operations re-arrange the distribution of the morphosyntactic pieces[20] and vocabulary insertion proceeds (i.e., the insertion of phonological features).

Most important to this study, subject-verb agreement is a condition on word formation that applies exclusively at a post-syntactic level, the MS. This level takes as input the output representations of the syntactic component (e.g. (35) c above) and introduces the morpho-phonological information that will feed the phonological form (e.g. ((35) d). Halle and Marantz (1993) propose that an Agr morpheme (e.g. *–s*) is inserted into the syntactic complex head V+Tense[21], as

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[20] See Embick and Noyer (1999 2001), for a detailed discussion of which operations apply at which level.

[21] Following Marantz (1989), Halle and Marantz assume that verbs do not raise to T in English. Rather, T *merges* with the verb under adjacency, forming a complex syntactic head. On the other hand, auxiliary verbs raise to T, yielding the correct word order, cf. (i) where the verb follows the adverb *definitely* with (ii) where the auxiliary precedes the adverb.

i. John definitely <u>lost</u> the election.
ii. John <u>has</u> definitely lost the election.

This proposal differs from the previous approaches to verbal morphology, as the operations that bring the verb together with its tense features, are not syntactically driven (e.g. feature checking

shown in (36)c. This morpheme serves as a link through which the features from the subject are copied to the verb, to obtain (36)d after vocabulary insertion applies.

(36)

a. $[_{IP}\ [_{DP}\ 3^{rd}\ [+sg]]\ [_{I}\ [+pres][_{VP}\sqrt{F}\ ]]]$ syntax

b. $[_{IP}\ [[_{DP}\ 3^{rd}\ [+sg]]]\ [_{I}\ [_{VP}\sqrt{F}\ [+pres]]]]$ syntactic merger

c. $[_{IP}\ [[_{DP}\ 3^{rd}\ [+sg]]]\ [_{I}\ [_{VP}\sqrt{F}\ [+pres]\ [_{agr}3^{rd}\ [+sg]]]]$ agreement insertion at MS

d. [HE] [WORKS] vocabulary insertion

Therefore, on this view, there is no *syntactic* operation involved in the realization of subject-verb agreement in English: "Specifically, an Agr morpheme is added to [-participle] INFL node at MS, and the Agr morpheme is fused with the INFL morpheme into a single node (Halle and Marantz 1993:125)." Thus, agreement is completely a post-syntactic operation.

3.2.5 The Hybrid approach: Lasnik (1995a)

Finally let us consider the *Hybrid* approach to verbal morphology. Lasnik (1995a) proposes another way of explaining how the verb comes to bear inflectional morphology. We have seen that Chomsky (1993) departs from the

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in Chomsky (1993) or quantification for Pollock (1989). It is reminiscent of Chomsky (1957) and Edmonds' (1976) transformational proposal that lowers AUX to V.

standard theory by assuming that the verb is inserted in the derivation with all its morphemes, while Halle and Marantz propose that agreement is a postsyntactic operation Lasnik (1995a) adopts a hybrid approach to verbal morphology. He proposes, contra Chomsky, that lexical verbs are not inflected in the lexicon, but he assumes Chomsky's lexicalist approach for auxiliaries *be* and *have*.

Adapting Chomsky's (1993) proposal that inflected verbs need to check their features against the morphological features of functional categories, INFL –the potential target for feature checking– can be "freely an affix, or a set of abstract features. (Lasnik 1995a: 105)" Accordingly, a featural value triggers verb-movement to INFL, whereas an affixal value does not establish a relationship with the verb syntactically but morphologically by means of affix hopping. The first type of INFL can be characterized as a bundle of uninterpretable features that once inserted in the derivation triggers verb movement. An affixal inflectional is inserted directly under INFL, with no further syntactic requirement.

Thus, if an auxiliary is selected in a derivation, it needs to check its morphology against an INFL that bears the relevant abstract features. On the other hand, an affixal INFL could not serve as the host of movement, as it does not bear the relevant features that can check the verbal features. Thus, in English, affixal INFL can only be selected when a lexical –uninflected- verb is introduced in the derivation. Given the affixal nature of INFL, INFL eventually lowers to the verb. This operation, based on Chomsky (1957) also adopted in Halle and Marantz (1993) and Bobalijk (1995), is similar to affix hopping rule in Chomsky

(1957), but in this case, rather than being a syntactic operation, Lasnik proposes that Affix Hopping is a "PF process (different from head movement) demanding adjacency."

The difference in the featural composition of auxiliaries and lexical verbs gives rise to a crucial distinction in English. Although most languages select only one value for INFL (for instance, Spanish and Italian verbs uniformly project featural INFL and therefore display verb movement in matrix sentences), the English INFL category appears to be 'hybrid' (Lasnik, 1995a). That is, two different inflectional elements coexist in the system: a featural INFL (F) that triggers pure feature movement in the case of auxiliaries and modals, and an affixal INFL (Aff), which is only morphologically realized in third person singular contexts by the morpheme [–s]. In all other present tense contexts, it is realized by a zero morpheme or by [-ed] in past tense contexts. As we will argue, this 'hybrid' property of English is at the heart of children's difficulty in acquiring English morphology.

The first inflectional item [$_{INFL}$ F] is selected when modals and auxiliaries are inserted in the derivation (37), and the second element [$_{INFL}$ –s$_{Aff}$] is selected along with lexical verbs (38). Any other combination would result in a formal feature that is not checked off, and consequently, in a derivation that does not converge for interpretative purposes (see Lasnik 1995a for details).

(37) a. The bear [$_{INFL}$ F] [$_{VP}$ can jump the fence]

b. The bear [$_{INFL}$ can$_i$] [$_{VP}$ t$_i$ jump the fence]

(38) a. The bear [$_{INFL}$ –s$_{Aff}$] [$_{VP}$ jump the fence]

b. The bear [$_{INFL}$ -][$_{VP}$ jump-s the fence]

The distribution of affixal INFL is affected by the presence of negative markers in negative contexts, as exemplified by (39) in the next section. In negative contexts, affixal INFL cannot lower to the verb and a semantically empty verb-like *do* appears.

3.3 The syntax of Negation

Natural languages have different ways of expressing negation; one of them is sentential negation, the focus of this section. Different morphemes realize the semantic values associated with this category and their interaction with the syntactic properties of other functional categories has granted these elements a position in the syntactic structure (as first proposed in Pollock 1989). As a functional category, Σ is expected to vary parametrically across languages. Laka (1994) proposes that the source of parametric variation for the expression of sentence negation lies in the *selection specifications* of the Neg category in each language. Her approach is in line with the Principles and Parameters approach (Borer 1984, Chomsky 1991); the variation should reduce to the properties of functional lexical items (see also Zanuttini (1997)).

3.3.1 English Negation and do-support

The structural differences in the realization of Neg are a consequence of the selection requirements of functional heads: in English and French, Neg selects a VP and in Basque, Neg is external to TP. Although these languages initially start with Neg and T at different structural position, Laka (1994) proposes that before spell out (surface structure in her framework), Tense needs to dominate all sentence operators including Neg. She defines the Tense C-Command Condition (TCC) as follows: "Tense must c-command at S-structure all propositional operators of the clause (pp. 3). "

Following Chomsky (1991), she further assumes that Infl lowers to the lexical verb in English, and subsequent raising of the complex at LF satisfies the ECP. However, the presence of Neg alters this relation. When Neg is present, Infl cannot lower to the verb because Neg will be no longer c-commanded by Tns (located under Infl) and the consequent raising of the verb at LF cannot rescue the derivation given that the TCC applies at S-Structure. Thus, *do* insertion is seen as a direct consequence of the TCC.

Bobaljik (1995) and Lasnik (1995a) take a slightly different approach to understanding *do*-support (based on Chomsky 1955). Given that the relation between the verb and the Infl head is established in the Morphology, negative heads disrupt the adjacency between the heads to be merged, and so morphological merge cannot apply; to avoid stranding a morpheme, the lexical empty verb *do* is inserted as shown in (39)b.

(39) a. The bear [$_{INFL}$ -s$_{Aff}$] [$_{NEGP}$ not [$_{VP}$ jump the fence]]

b. The bear [$_{INFL}$ do(e)-s] [$_{NEGP}$ not [$_{VP}$ jump the fence]]

Here, negation markers will not affect the relation between a featural Infl and the verb, since that relation is established in the syntax, where morphological operations do not interact with feature checking.

Laka's proposal (based on Pollock's (1989) analysis of verb movement in French and English) brings to the fore a parametric issue: Neg is a functional *category* and so it is bound to give rise to variation across languages, which, paired with invariant principles of UG can unify seemingly unrelated phenomena. On the other hand, Lasnik's and Bobaljik's analyses raise a different issue: Sentential Neg *morphemes* have different degrees of structural effects across languages. One may interpret their effects as purely morphological or as syntactic or a little bit of both. Regardless of the focus, we should find how to tie together the effects of the morphemes and the effects of the head. The solution should be reducible to the formal properties of the heads (Borer 1984, Chomsky 1995a and references within).

3.3.2 Parametric values for ΣP and English negation

I propose in this dissertation that the morpho-syntactic values of Σ vary parametrically. I propose that $\Sigma_{[neg]}$ comes in two 'flavors' affixal Neg and featural Neg. In English, $\Sigma_{[neg]}$ is realized by different *three* negative morphemes or markers (1) *n't* and (2) *not*, and (3) a null morpheme ($\varnothing_{[neg]}$). The first two

morphemes (*n't*/*not*) are associated with the *affixal* value of $\Sigma_{[neg]}$. Affixal $\Sigma_{[neg]}$ does not have syntactic requirements (i.e. it does not need to check formal features)[22]. As discussed for affixal Infl, this affixal Neg requires a verbal element to which it can attach, specifically an element bearing a [+v] feature. As it is a morphological requirement, this element does not trigger any type of movement, instead it looks for a host in the morphology.

In the case of auxiliary *be* and *have*, verb movement is triggered by the selection of a featural INFL. Assuming that movement is cyclic, the verb goes through Σ_{neg} and picks up the affixal element, deriving (40)b from (40)a. In doing so, affixal Neg finds a lexical host. [23] Finally, the complex reaches INFL to check the [F] feature, yielding (40)c.

(40) a. $[_{I}\ I_{[F]}\ \ [_{NEG}$ n't$_{[aff]}$ $[_{VP}$ ~~is~~ reading [all the antiwar messages]]]]

b. $[_{I}\ I_{[F]}\ \ [_{NEG}$ is-n't$_{[aff]}$ $[_{VP}$ reading [all the antiwar messages]]]

c. [… $[_{I}$ isn't $_{[F]}$ $[_{NEG}$ ~~is-n't~~$_{[aff]}$ $[_{VP}$ reading [all the antiwar messages]]]]

Matters are slightly different in simple declarative sentences with lexical verbs. There is no verbal movement in derivations with lexical verbs: Infl *itself* is

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[22] At least, one could say, it does not need to check features beyond those that allowed the merging of Neg to the ongoing derivation.

[23] This can be extended to account for do-support in emphatic contexts: $\varnothing_{[emph]}$ realizes $\Sigma_{[af]}$ (i) as discussed in Laka (1994). In (ii), the $\varnothing_{[emph]}$ affix is picked up by the moving auxiliary. See footnote 26

(i) He IS reading newspapers

an affix that needs a host, as the representation in (41)a illustrates. We have now two affixes in search of a host: do-support applies to provide morpho-phonological support to both Infl and Neg, as in (41)b.

(41) a. [$_{I}$ -*s*$_{[aff]}$ [$_{NEG}$ n't$_{[aff]}$ [$_{VP}$ read [foreign newspapers]]] (Syntax)

b. [… [$_{I}$ *do-es* n't [$_{VP}$ read [foreign]]] (Morphology)

Next, consider the possibility of the zero negative morpheme ($\varnothing_{[neg]}$) and assume that the $\varnothing_{[neg]}$ morpheme is featural. Following Chomsky (1995a), there are two ways of checking (uninterpretable) features: by movement or by merge. In the partial derivation in (42)a, there is no potential element that can check the features of $\varnothing_{[neg]}$; thus, a negative element (e.g. *never*) is merged into the specifier position, checking the necessary features of Σ_{neg}, as in (42)b. Once affixal INFL is merged (42)c into the derivation, (and case features are checked), affixation may proceed under adjacency, provided that specifiers do not count for morphological adjacency. Bobaljik (1995) assumes a similar analysis for these cases. For Bobaljik, *adverbs* do not disrupt adjacency. Moreover, he assumes that English *not* is in spec, NegP. My proposal is slightly different in that I take the specifier position of Neg to be invisible for merge, and *not* to be in the head position.

(42) a. $[_{NEG} \varnothing_{[neg]}]\ [_{VP}$ …read newspapers]]]

b. $[_{NEGP}$ never $[_{NEG} \varnothing_{[neg]}]\ [_{VP}$ …read newspapers]]]

c. $[_{IP}\ldots[_{I} -s_{[aff]}\ [_{NEGP}$ never $[_{NEG} \varnothing_{[neg]}]\ [_{VP}$ … read newspapers]]]

c. $[_{IP}$ … ___ $[_{NEGP}$ never $[_{NEG} \varnothing_{[neg]}]\ [_{VP}$ … reads newspapers]]]

So far I have proposed that two different morphemes realize Σ_{neg}, one bears an affixal value (*not*/*n't*), triggering affixation onto *do* in the morphology, and the second morpheme, a phonological empty morpheme, has a featural value, which is satisfied by merging an adverbial (e.g. *never*).[24,25]

I have restricted the discussion to English, which has two different negative heads, *not*/*n't* and a null $\varnothing_{[neg]}$. At this point, this distinction may seem ad-hoc, but it will appear less so once the facts about the historical development of negation in the English language are considered[26].

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[24] Furthermore, we can extend this proposal to explain the ungrammaticality of (iii) and (iv). Let's assume that *nothing* is specified with an interpretable [+neg] feature, which can check the features of $\varnothing_{[neg]}$, yielding something like (v) by feature movement.

iii. *He never $\varnothing_{[neg]}$ likes nothing iv.* He doesn't like nothing
v. He $\varnothing_{[neg]}$ likes nothing

This theory implies that *movement is preferred over merge* (my thanks to Howard Lasnik for pointing this out and suggesting the following direction). Chomsky (1995, 2000, 2001) claims that the opposite, *merge over move* is more economic as *move* involves more steps than simple *merge* (*agree* + *merge*). Vukic (2003) discusses the conceptual advantages of a theory of move over merge and concludes that *expletives* (non-thematic elements) are inserted from the lexicon as a last resort. If we adopt his conclusions, the derivation of (iii) should proceed as follows: *nothing* should check the features of Neg, as soon as $\varnothing_{[neg]}$ is inserted. Introducing *never* is then unmotivated. This theory, however, raises a question about the semantic specification of *never*.

[25] Obviously, *never* is not an expletive like *there* or *it*.

[26] Something along these lines is assumed for the $\varnothing_{[emph]}$ morpheme in (iv.a). The suprasegmental features of this morpheme, which lack a phonological matrix, require a host in order to be

3.3.3 Negation and language change

My proposal can be extended to other languages. Old English (OE) negation has properties similar to those of modern French negation in which there are two negative elements *ne*, a head, and *pas* a specifier (Pollock 1989). In OE realizes Σ_{neg} by means of the morpheme *ne*/*na* which –according to my hypothesis- has a featural specification that is satisfied by merging *noghte* in the specifier position. OE is a V-to-I language and consequently, the verb moves cyclically through the head of NEG, pied-piping *ne*/*na* and yielding (43). In the 15th century, *ne*/*na* disappears and *noghte* becomes the only overt negative marker. At this stage, V-to-I is still possible. The negative marker still appears to be projected in the specifier position (cf. (44)). This suggests that the Σ_{neg} head is now realized by a null morpheme, which still bears a featural value that requires the insertion of the overt negative marker in its specifier position (if there is no other [+neg] candidate in the derivation).

(43) He ne held it noght

(44) My wyfe rose nott (from Pollock 1989:367, Mossé, 1959:153)

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realized. As affixal Infl is inserted, do-support is triggered (iv.c), and both items find a host. See also footnote 23.

iv. a. [$\varnothing_{[emph]}$ read the newspapers]
b. …[-*s* [$\varnothing_{[emph]}$ read the newspapers]
c. …[*does* [$\varnothing_{[emph]}$ read the newspapers]

By the middle of the 16th century, verb movement is completely lost (Kroch, 1989), but the overt negative marker still retains its specifier status. This is suggested by the increase in number of examples like (45), where the marker precedes an inflected verb. Assuming that V movement was lost at this point, it is reasonable to conclude that Infl shifted to an affixal value. Hence, in (45), Infl has lowered into the verbal head.

(45) He not spoke those words

(Visser 1969; extracted from Lightfoot 1993:205)

In addition, *do*-support was not yet an option. In the final stage of the development of English negation, the overt negative marker becomes affixal and it is re-categorized as a head. This is suggested by the increasing use of *do*-support in negative contexts. It is likely that when periphrastic *do* became a tense carrier it forced the reinterpretation of the *barrierhood* properties of negation, and thus it could have forced the negative item *nott* to be reinterpreted as a head (Lightfoot 1993).

However, the fact that *nott* became a head does not necessarily mean that the featural null negative morpheme was eliminated from the grammar. The presence of the featural value for $\varnothing_{[neg]}$ in modern English can be understood as a fossil of the OE negation system. This being the case, my proposal that English has two different negative morphemes is not stipulatory, but can be considered well grounded in the history of the English language.

3.3.4 Negation in Scandinavian languages

We also find an instantiation of this affixal/featural distinction for negation in Scandinavian languages. For instance, Swedish is verb second in matrix sentences, cf. (46), but in embedded sentences, the verb does not move to the C position, as the target is filled by a complementizer. In those cases, the verb remains in situ and appears to the right of the negative marker *inte*. This is shown in (47) and (48), where moving the verb over negation results in ungrammaticality. This contrast supports the claim that in Swedish there is no V to I movement, unless the verb moves to satisfy the requirements of C. Like English, Swedish has an impoverished morphological system, with affix hopping merging the tense/agreement morpheme with the verb along the same lines as English (Vikner, 1995).

(46) Igår köpte Lena inte en ny bok
Yesterday not bought Lena a new book
Lena didn't buy a new book yesterday

(47) … att Lena inte köpte en ny bok igår
… that Lena not bought a new book yesterday

(48) *… att Lena köpte inte en ny bok igår
… that bought Lena nots a new book yesterday

(adapted from Vikner 1995:45,(28))

Given that in matrix sentences, verb movement over negation does not pied-pipe the negative marker and in embedded sentences negation does not block affix hopping, it is reasonable to conclude that the Σ_{neg} is realized by a zero morpheme that has a featural property, satisfied by the insertion of the negative marker *inte* into the *spec* position. From this position, *inte* does not block the application of affix hopping.

(49) Jag pratade inte med någon
I spoke not with anyone

3.4 Summary

To summarize, in this chapter I have laid out the theoretical framework I will use to describe children's non-adult patterns. I have considered different syntactic models that describe the properties of Infl in English. I will adopt Lasnik's (1995) analysis of English verbal morphology. Moreover, based on Lasnik's (1995) parametric account of (hybrid) Infl in English, I have proposed the possibility that the morphological items that realize Σ_{neg} may take one of two values: featural or affixal. Featural Σ_{neg} needs to be checked by a [+neg] interpretable feature, which can be satisfied by merging a negative adverb (e.g. *never* in English, *inte* in Swedish) or by moving the relevant feature from within the checking domain of the head (e.g. long agreement as in *he likes nothing sweet*, see also footnote 24 above). An affixal value for Σ_{neg} requires that this head be attached to a proper lexical host, namely some inflected form of dummy *do*.

4 A Longitudinal Study

> *A sufficient demonstration of inadequacy would be to show (…) that certain very simple ways of describing grammatical sentences, cannot be accommodated within the associated forms of grammar, and that certain fundamental formal properties of natural languages cannot be utilized to simplify grammars.*
> Chomsky, 1957:34

4.1 A study of inflectional systems

In this chapter, I will present the data collected in a longitudinal study of four children that studied the development of inflectional items in simple present tense contexts. In the first half of the chapter, I will discuss the technical aspects of the longitudinal study, including a description of the methodology used to collect the data, the experimental protocols and other technical considerations. In the second half of the chapter, I discuss each child's individual linguistic profile, after discussing the general results. I will show syntactic variation in child language that was previously overlooked and that goes beyond that predicted by the constructivist and generativist models discussed in the previous chapter. I will focus on two child grammar characteristics that the constructivist and the maturation approach to acquisition predict: conservativity and early (adult) knowledge of morphological knowledge. I will show that the grammatical hypotheses children initially assume do not closely match the input or

demonstrate early adult knowledge of the morphological associated with Neg and Infl.

4.2 Methodological considerations in longitudinal studies

Most of the studies on children's development of inflection are based on spontaneous production data that is available on the CHILDES database (MacWhinney 2000). For much of the data that is housed on the database, the data is obtained by audiotaping and/or videotaping a child playing with a caretaker or experimenter. The advantage of using the CHILDES database is that the data are accessible to anyone, and generally accepted in the literature as a trustworthy source of data. For many of the children whose data are posted, longitudinal data are available, alleviating the need to test children over a period of time. However, there are notable disadvantages too. The major disadvantage is that the sessions with the child are not designed to test any particular hypothesis, which can mean a session yields little valuable data. It may also be that the phenomenon of interest may not occur in the transcripts of a session, and it is often difficult to determine the cause of its absence.

The 'scarcity of data' problem turns out to be critical for investigations of the development of inflection because naturalistic play between a child and caretaker is usually bound by the 'here and now'. The 'here and now' elicits many 1st and 2nd person utterances between 'you' and 'me', but few 3rd person ones. This is unfortunate, since it is verbs with 3rd person subjects that require the agreement morpheme *–s* that is critical to our understanding of inflection. In

addition, children use little negation in naturalistic sessions, preferring to use positive utterances when there is a choice. This severely limits another important potential source of data on inflectional development.

Many of the problems encountered with naturalistic production can be tempered by introducing experimental techniques. Elicited production experiments can be designed to increase production of the 3rd person inflectional affix *–s* that is required in simple present contexts. The games that I will shortly describe were designed to elicit utterances in contexts that require the overt realization of inflection.

4.3 The study

I analyzed data collected using elicited production techniques combined with data obtained from spontaneous production to provide a robust data sample for each child. I collaborated with Prof. Rosalind Thornton in conducting a longitudinal study in the language acquisition lab of the University of Maryland.

We were interested in affirmative and negative 3rd singular contexts (e.g. *George reads newspapers* and *George doesn't read newspapers*). Negative sentences are crucial to determine what verbal form children use in obligatory uninflected contexts (Harris and Wexler 1996), a necessary control to check children's knowledge of the morphological properties of Infl.

4.3.1 Equipment for taping and transcribing

All of the sessions were videotaped with a professional Canon XL1 video camera. The microphone on the camera was of sufficient quality that we did not need to attach a microphone to the child.

A posteriori, I transcribed many of the taped sessions by using a digital VCR, which guaranteed the preservation of digital sound quality, crucial for the transcribing task. Each transcription was first saved as a Word file, and after the checking procedure was finished, it was transferred to an Excel file. Each word file was coded with tape times for later access. The time coding allowed us to disambiguate certain contexts, especially to determine reference and tense (see §4.4 below for details about exclusion criteria).

During the first stages of the study, after a first transcription pass was done by me, Prof. Thornton checked the transcription's accuracy. Later we recruited the help of undergraduate to help us transcribe and check the transcripts. Over the 4 years of studies, we trained five undergraduates. Their training consisted in two steps: first, they listened to an already transcribed session while reading its transcript in order to become familiar with the child's speech, and the coding techniques. Once they felt confident with the task, they were asked to check for the accuracy of the transcripts. Finally, they were assigned a given number of tapes to transcribe. They also were asked to check for the accuracy of other transcripts. In sum, all the files were checked by another transcriber at least once.

4.3.2 The subjects

I report data from four children. We worked with two other children for a short period of time, but these children's participation was discontinued. In one case, the child clearly had articulatory problems, making it difficult to transcribe his files. The second child turned out to be already too advanced at the start of the study. Of the four children investigated in this study, 3 were girls, and 1 was a boy. We met 1 child's mother through a family club for mothers who work in the home, and the remaining 3 children's mothers responded to a flyer that was posted in playgrounds near the University of Maryland at College Park campus.

All four children were monolingual speakers of English. The children were all quite outgoing and willing to participate in different games with the experimenters, and puppets. The children all had college-educated parents, and in all cases, the mother was at home with the child or children of the family.

4.3.3 Frequency time span and duration of the study

The children visited our language acquisition lab with their mother approximately every two weeks. The ages of the children at the beginning and the end of the study are reported in Table 1, along with their initials and the number of sessions in which each child participated. On average, the children's starting age was 23.4 months, and the average age at the end of the study was 36.5 months. The children's ages are within the Optional Infinitive stage (Wexler 1992, 1994; see chapter 2 for a detailed description of this stage), and precede the onset of overgeneralizations expected by Tomasello (2003) (see §2.4.3).

Table 1: Participants' ages and duration of study

Subject's name	Age at beginning of study	Age at end of study	Number of sessions under study
CM	1;9.4	2;8.29	18
CW	2;0.12	3;0.8	18
SL	1;10.23	2;8.20	19
SF	2;1.9	3;8.03	31

The initial commitment was to participate in the study for approximately a year, although in CM's case, it was less than 9 months as her grammar quickly became adult-like, and SF participated for more than 12 months. As will become apparent in the following sections, it is not possible to average the timing and order of the grammatical changes each child grammar underwent to reach the adult target (i.e. the different inflectional forms adopted to realize inflectional information in negative and affirmative contexts).

In every case, we considered the child had reached the adult stage (at least with respect to the realization of inflectional items) when the child produced approximately 90% inflected forms in *both* affirmative and negative contexts. Therefore, the length of participation in our study varied, depending on how long it took children to become adult-like with respect to inflection.

4.3.4 Structure of Experimental Sessions

Each session began with some free play (usually, the children would choose which toys they wanted to play with) to 'warm up'. Once the child was comfortable and playing with the experimenters, the elicited production games were introduced. Sometimes the mother participated in the play, but on most occasions, was an observer.

In the games that employed elicited production techniques, the child was put in a situation in which production of the target utterances was felicitous. In orchestrating these games, it is usually the case that the experimenters avoid using the targeted structure in their own speech, providing a circumlocution or a different structure altogether. This was not possible in our case, because our focus was children's use of inflectional morphemes, and it was not possible to avoid using inflection. For this reason, the decision was made that the experimenters would talk normally throughout the experiments.

4.3.5 Protocols for the experiments

Three different game protocols were designed to elicit 3PSg contexts. These protocols were successful in eliciting a substantial number of affirmative and negative sentences from each child. We used these protocols as many times as possible in each session, as long as we could keep children engaged in the games. If they were not interested in a particular game, we would simply switch to another game protocol, or to a period of free play. In the second case, no special structure was targeted. It should be noted, however, that to some extent,

as long as the experimenters introduced other people, characters, or toys as the topic of conversation in the 'free play', the likelihood of eliciting 3rd person subjects was greater than if the child just played with some experimenter who had no phenomenon of interest in mind. With this caveat in mind, we can say that each session was a mix of spontaneous production and elicited production games.

4.3.5.1 The Fitting Game

This game was designed to elicit sentences with 3rd person subjects from the child. The game capitalizes on a child's interests at a given point in time, making any exchange of questions and answers pragmatically natural by talking about a situation that the child has built, and by using a puppet, who is introduced as a silly character that always says silly things but wants to learn. As an example, I present a representative excerpt in (50). Given that the content is anchored in the context the child is creating (for instance, filling up a train/a house/etc. with toys), the child's response is not entirely controlled by the experimenter. Nevertheless, the expectation is that the child will respond to the lead-in phrase of the experimenter. The game proceeds more or less as follows. The experimenter –aided by a puppet- asks the child if the puppet can play with her/him. Once the puppet becomes familiar with what the child is doing, the puppet makes a silly comment related to the situation or asks a *yes*/*no* question. (see (50) below)

(50) Subject: CW (Age: 2;3.7)
Protocol used (in excerpt): *Fitting game*

Con: Exp2, two puppets (Bear, and Cat), and CW are on the carpet. CW goes to toy cabinet and gets some more toys.
CW: You want to share this xxx with Barney.
CW: (picks up a toy) where he goes?
Exp2: Do you remember?
CW: He goes in train.
Con: Exp2 brings down a train so CW can place the toy
CW: He goes over there.
(…)
Exp2: But he wants to go here.
CW: He goes right in there.
Exp2: Can you put it there?
CW: He can fit there in the train.
(…)
Exp2: oh, where do you think he can go?
CW: He goes right there.
Exp2: And the clown? Can the clown go right here?
CW: No, he not-he goes in the middle and he can ride
Exp2: Look! He can go there!
CW: no he can't. xxx
Exp2: But I know that Tigger wants to go there. Can we put Tigger here?
CW: No that(?) too big(?) to go on his hat
Exp2: Can we try it just once?
CW: xxx the clown
(…)

4.3.5.2 'How about you?' game

A second experimental situation was designed to elicit answers from the child with ellipsis of the verb phrase. VP ellipsis was of interest, in part because it requires the child to use do-support with lexical verbs. The game engaged the child in a series of question/answer pairs in which the experimenter kept the discourse going to elicit more VP ellipsis by using the lead-in '*how about X?'*

On one scenario (see (51) below for an example), the two experimenters and the child sit in a circle, all of them holding a puppet, and commenting on that puppet. One of the experimenters starts the game by selecting some food and, taking the role of the puppet, she pretends to eat and exclaims "*I like pizza! How about you?"* The other experimenter/puppet tries the food and declares

whether she likes it or not and then asks the child *How about the bear? (or any puppet that the child is holding)*. While VP ellipsis is not required as a response , the pragmatics of the situation encourages an elliptical response. Although there are many possible continuations to this lead-in, this type of situation does indeed set up the right conversational context for the child to naturally produce 3PSg utterances.

(51) Subject: CW (Age: 2;8.23)
Protocol used (in excerpt): *VP ellipsis game*

Exp1: ok, well I'm hungry too. I want to eat something.
CW: tomatoes
Exp1: let's try some different food. Shall we do the pickles first or tomatoes?
CW: but she's got the tomatoes.
Exp1: we could all have a taste
Exp2: I never tried one before
CW: but the kitty is gonna have a try.
CW: xxx
(….)
Exp1: the doggy likes the cheese. How about the kitty?
CW: I like the cheese
Exp1: good. So the bear likes the cheese, the doggy likes the cheese, how about the kitty?
CW: she does
Exp1: she does. Let's try something else.
CW: ok, different food.
Exp1: the bear goes first.
CW: and then you get to hide your eyes, ok Mr. Dog?
Exp1: maybe I could do that later. Let's try food. Can I try the onion first? I don't like that too much. Your turn.
Exp2: the bear doesn't like it.
Exp1: how about the kitty?
CW: I like it!
Exp1: what did the kitty say?
CW: he said " I like it".
CW: did you like it Mr. Dog?
Exp1: no I don't like it
CW: do you like it Mr. Bear?
Exp2: no, what about you?
CW: yes I do.

4.3.5.3 The Negation Game

In this situation, one experimenter presents the child with a series of objects which can do or cannot do certain actions (bend, open, close, swim, fly, walk, float, squeak, stretch, stick) or which have a certain attribute (have spots, have a tail etc.), and invites the child to test the objects and tell her whether each of the objects satisfies the criterion. A typical way of introducing this way would be as in (52) below, where the child is invited to test a series of flashlights to see if they work:

(52) Exp1: Look at all these flashlights I have… some of them are good but not all of them. Do you know how to turn on a flashlight? (…) Good, because I need some help… could you tell me if they work? You test them…
Con: Exp hands child a flashlight.
SF: It work! It works…

Then, the experimenter picks an object and makes sure the child knows or understands the targeted verb, and then asks the child whether the next object can do the action just demonstrated, avoiding use of the targeted inflected form. By testing a series of objects, we maximized the opportunities for collecting 3rd person singular data. A typical lead-in and child's follow-ups are exemplified in (53).

(53) Subject: SF (Age: 2;7.28)
Protocol used (in excerpt): *Negation game*

Exp1: do you want to do an experiment and tell me if they open?
SF: yeah
Exp1: ok.
(…)
Exp1: oh! The big box. Tell me if they open, ok?
SF: what…what's inside here?

Exp1: well you can look, but first you have to open it.
SF: it's open.
Exp1: ok. That one?
SF: it's open
Exp1: ok, nothing was inside
SF: --- (shakes head)
Exp1: I know this one opens, this one opens, how about this one?
SF: it's open
Exp1: we have only one left.
SF: probably not
Exp1: what did you say?
SF: this not opens
Exp1: but most of them did. This one opens, this one opens and this one…
SF: not…this one not opens
(…)

The game proceeds and the child sorts the objects into piles. This technique was adapted to create new scenarios to test each visit, so that the child was not repeatedly subjected to the identical situation. This was important, especially in the case of SF since his passage to achieving adult-like negation was lengthy.

4.4 Analyzing the data

In this section, I discuss the general procedure followed in analyzing the data and the exclusion criteria used. My first working hypothesis was to confirm that these children had early knowledge of inflectional morphology, as argued by Wexler (1994, 1998) and Harris and Wexler (1996).

After we created an excel file for each child, and a spreadsheet for each session, the data was analyzed following different criteria. I first searched each spreadsheet for all children's utterances containing 3rd person singular subjects. Transcript chunks that were unclear for both transcriber and checker were eliminated from the data count (transcribed as xxx in the transcripts). This was

done by looking at the contextual information provided by the videotaped sessions. This was particularly useful to disambiguate ambiguous utterances. For instance, visual information was used to determine whether the child referred to a singular or plural subject in cases like (54):

(54) The cats have tail (SL 2;5.7)

Without contextual information, this example could have been classified as plural 'cats'. We used the footage to determine whether there was more than one cat in the context of utterance. Given that in the given situation there was only one cat, and in the tape, the child walks to the cat and looks at it, it was safe to say that the referent for "the cats" is *singular*. Consequently, the utterance was classified as a 3rd person singular: *the cat s have tail*[27] (meaning, the cat *has* a tail). If the visual or situational contexts did not help to disambiguate the expression, the datum was excluded from the data count. Repetitions of the same utterance that were not contiguous were included. Thus if a child said *the bear eats cheese* at the beginning of the session, and later said *the bear eats cheese* in a different situation, both utterances were counted. One type of repetition was not included: if, after uttering a sentence, the child repeated it verbatim, it was not counted. I did

[27] I adopted the convention of transcribing these type of utterances with the morpheme *–s* not leaning onto the subject (the cat's). Later I will provide support for this decision (see §4.5.1).

include *near repetitions*, that is, utterances that were repeated but were slightly different from the previous utterance as the example shown in (55):

(55) CW (Age: 2;2.13)

Exp: can you try and see if it fits?
CW: He's not fit
CW: He not fits
CW: He's not fit
CW: He not fits

Near repetitions after adult utterances were included as long as there was a change in the structure (different pronouns, different verb marking, different object/subject). Verbatim repetitions after adult utterances were not included.

Once all the 3rd person singular (3PSg) utterances were counted, we classified the data into two broad types. Group 1 included simple present declaratives, Group 2 included modal auxiliary declaratives, and Group 3 included VP ellipsis (I set aside yes/no questions and wh-questions, and group 3 for future research) Then, we classified group 1 (simple present declaratives) according to the expressed verb form: (3) inflected forms and (4) uninflected forms. Finally, we classified each of these groups into group 5 (affirmatives) and group 6 (negative utterances).

While classifying the data into groups 5 and 6 from CW's and SL's files, it soon became obvious that these children were realizing inflection in ways other than the expected affixation. This lead us to consider that these children had a set of hypotheses different from those that could be extracted from the input, and that their morphological knowledge was not adult-like. As more files were

transcribed, and more data were collected, it was necessary to organize the data in group 2 according to the structural distribution of the agreement morpheme. Thus, the data in group 2 was categorized into orphan agreement (e.g. *Daddy s have a tai*l) vs. affixal agreement (*it opens*). The analysis of negative utterances in group (6) was also classified according to the position the agreement morpheme [-*s*] occupied with respect to the negative marker (preceding, as in *he s not V*, or following *not* or *n't* as in *it not V-s*) and whether it used the dummy verb *do* (*it doesn't V*). Negative utterances that contained an uninflected *do* (e.g. *it don't open*), were classified as uninflected. Examples of each category are shown in Table 2 below.

Table 2: Categories used to classify child data

	Affirmative 3Psg	
	Orphan	**Affixal**
Inflected	*Butterfly s fit this* (SL 2;1.9)	*That goes there* (CW 2;1.6)
Uninflected	*My chip go with my cheese* (CW 2;0.12)	

	3Psg Negative		
	Orphan	**Affixal**	**Do-support**
Inflected	*Bear s don't want sit* (SL 2;1.9)	*It not works* (SF 2;10.11)	*He doesn't like goldfish* (CM 2;4.12)
	No do-support		**Do-support**
Uninflected	*He not have a mouth or nose* (SF 3;4)		*It don't fit this way* (SL 2;1.9)

4.5 Results

From the four children who participated in our longitudinal investigation, we collected 2523 3PSg utterances, 831 had no inflectional morpheme and 1692 contained (some kind of) inflection. Both uninflected and inflected utterances were attested throughout the study, with an eventual sharp decrease of uninflected verbs (and concomitant increase of inflected verbs). Exactly when that change occurred varies greatly from child to child. I will shortly return to the particular characteristics of each child's development.

Initially, we explored the possibility that the non-adult utterances containing *orphan* morphology, such as *Daddy s have tail*, were speech errors. However, the idea was ruled out on the grounds that this type of mistake did not extend to other contexts. First, plural readings of the subject were ruled out by checking the conversational and visual context. Second, this morphological item was also produced along with singular pronouns (*he*, *she* and *it*). An alternative explanation was to consider *Daddy s* as an unparsed chunk (cf. Wilson 2003), but the prediction here would be that the chunk may be used in other contexts (e.g. modals, past tense, progressives). No such subjects were found with other verb predicates (cf.(56) a-d, where # means unattested).

(56) a. #the bear s can eat the cake

b. #the bear s is eating the cake

c. #the bear s ate the cake

d. # the bear wants to s eat the cake

Given that this type of morpheme is not found in the input, a natural conclusion is that children relate this element to the realization of agreement but that they are using a different set of morphological hypotheses for its distribution. If this is true, then we have shown that the constructivist conservativity expectation is not met. Moreover, if children use a different set of morphological hypotheses, then I have shown that 'early knowledge of inflection' falls short of explaining children's non-adult inflected forms. I extend these observations to the realization of negation in child language.

Therefore, I restrict the discussion of the results of our study to the following questions: (a) do children's hypotheses *conservatively* match the input as argued by constructivists? (b) do children have early knowledge of the morphological properties of inflectional items, i.e. set the inflectional parameter early, as argued by Wexler (1998)?

First, I will briefly discuss the overall patterns found in our dataset, which suggest that the first hypothesis does not hold in our database. Then, I will introduce the patterns as well as a developmental history for each of the children. In this section, I present and describe the patterns we found in very general terms, abstracting away from any specific theoretical model for now. A detailed account of amounts, stages, etc. is introduced for each child in §4.6. For a theoretical account of the patterns of the development of Infl and Neg, the reader is referred to chapters 5 and 6 respectively.

4.5.1 Non-adult affirmative patterns

In addition to the well-attested inflected/uninflected contrast in affirmative contexts, we found that some children were using a second way of realizing agreement. We found that 2 of the 4 children in our study produced this unexpected form of agreement morphology in which the agreement morpheme is dissociated from the verb[28].

In contexts where an adult would inflect the lexical verb (as in (57)), SL and CW did not necessarily associate the morpheme *–s* with the verb. Instead the agreement morpheme was realized higher than the verb, following the subject, as in the examples in (58). The displaced morpheme was consistently produced with singular pronouns, determiner phrases and proper nouns, as shown in the examples below[29].

(57) She lives in the water

(58) a. She s live in the water

b. Pooh s like pizza

c. Everybody s eat pizza

---

[28] The other 2 children produced utterances of this kind rarely enough that they are insignificant. This unanticipated alternative is produced quite consistently, and in fact, it is SL's preferred form at one point in her development.

[29] This pattern is noted by Stromswold (1990) to appear in Adam's files, as well. More recently, it has also been reported by Dye, Foley, Blumea, and Lust (2003). In Dye et al. children participate in an elicited imitation task, and some subjects repeat back utterances whose agreement morpheme *–s* is dissociated from main verb and relocated in a higher position.

I will refer to this option as *orphan Infl*, an agreement morpheme that is not associated with a verbal category. For now, I assume that the orphan Infl is functioning as a freestanding morpheme in our examples. Although, at first glance, the agreement morpheme appears to be associated with the subject, it can be argued that it is a rightward-leaning clitic. If the orphan morpheme relies on the phonological material to the left, then it should be possible anytime there is phonological material to the left but not to the right. However, in elliptical contexts, such as (59), this orphan INFL is produced only by C.W. when another element follows, as in (59)a. There were no instances in which she uses the orphan morpheme in an elliptical answer without morphological continuation as in (59)b

(59) Does the bear fit in there?

a. No he s not

b. # Yes he s

The absence of (59)b from the data strongly suggests that the orphan morpheme in (59)a leans to the right, as leaning is impossible if phonological material is absent. Regardless of the presence of phonological material to the left (in this case the subject), the sequence is impossible in the adult grammar and unattested in our child database.

A summary of our results is shown in Table 3 below. In the left column I specify the total number of finite/*inflected* utterances and non-finite/*uninflected* utterances collected in our research. I further specify the inflectional type used in

those utterances: orphan vs. affixal forms ([s fit] vs. [fits] respectively). Thus, we collected 2026 affirmative sentences, of which 656 were inflected, representing 33% of the total. 15% out of 1370 inflected utterances had an orphan Infl and 85% had an inflected verb.

Table 3: 3Psg affirmative utterances across subjects

	Type	
Inflected 1370(67%)	**Orphan** 201(15%)	**Affixal** 1169 (85%)
Uninflected 656(33%)		
Total: 2026		

It could be argued that collapsing the results in this single table falls short of truly capturing the developmental patterns attested in the data. First, it overlooks the individual differences, which in my view, represent the idiosyncrasies of the unique grammatical systems we are analyzing. Second, it minimizes the productivity of the third morphological alternative in child grammars. We thus need to look into each of the grammars that yielded these results. Before going deeper into the details, let us briefly discuss the realization of negation.

4.5.2 Sentential negation: more non-adult alternatives

In general, the results from the four children tested are consistent with previous observations (cf. Klima and Bellugi 1966; Harris and Wexler 1996), but not identical. All children showed early knowledge of all the different communicative functions negation expresses (Drodz 1995). That is, the children had the ability to express the common functions associated with negation (prohibition, rejection, failure, denial, etc.). However, the realization of sentential negation, on occasion, was syntactically different.

The children's early negative structures contrasted sharply with the structure the adult grammar offers. In adult English, there are two (grammatically and semantically identical) morpho-syntactic alternatives, as shown in (60)a and (60)b: and the agreement morpheme appears attached to a semantically vacuous verbal element *do*. Besides utterances like (60), which –importantly- were only attested towards the end of the study, we found a number of syntactic variants. The first type is shown in (61): the verb appears uninflected to the left of the negative markers (*not* or *no*).

(60) a. The bear does not eat cake

b. The bear doesn't eat cake

(61) The bear not/no eat

Two additional constructions, which contained a negative marker and inflectional information and yet were non-adult like, were found, examples

provided in (62) and (63). One variation contains a negative marker (*not* or *don't*) element followed by an inflected verb. I adopt Harris and Wexler's (1996) terminology and refer to this option as *medial negation* to avoid potential misunderstanding, as I use *affixal* to refer to the morphological properties of the functional categories. The other kind of utterance contains a negative marker (*not* or *don't*) preceded by the orphan inflectional. [30]

(62) This not opens (SF, Age: 2;7.28)

(63) a. He s not fit in there (CW, Age: 2;1.6)

b. Spider s don't fit train (SL, Age: 2;1.9)

These children's utterances realize the agreement morpheme, but the morpheme does not have the distribution it should according to the input. The results are analyzed in Table 4. We collected 497 negative utterances in 3PSg contexts. 65% of those utterances had some form of overt inflection: 33 orphan inflection (… s don't/not V…) representing 10% out of the total, 98 (30%) utterances had an inflected verb (…not Vs) and 191 (59%) were adult-like in that they used do-support to realize agreement information. Only 175 utterances had no inflectional information (… not/no/don't V…).

[30] For now, I will consider *don't* as an unanalyzed chunk. Later I will discuss why *don't* may have the same phrasal status as *not* and be impervious to the realization of inflectional information.

Table 4: Negative utterances across subjects

	3Psg Negative		
Inflected 322 (65%)	**Orphan** 33(10%)	**Medial** 98(30%)	**Do-support** 191(59%)
Uninflected 175(35%)			
Total 497			

4.6 The Children's developmental profiles

Although each of the patterns briefly described above was found in our database in significant numbers, not all children produced exactly the same patterns. There are interesting correlations between the complementary distributions of these patterns in each child's developmental histories, as well as across subjects. To name an obvious example, SF produced a significant number of utterances like (62) above while inflected *do* (i.e. *does*) was absent from his grammar (cf. (60)). SL also did not produce inflected *do* in the earliest stages. However, she did not produce examples like (62). Unless we look at each grammar and intermediate stages, any hope to find a generalization would be lost.

4.6.1 CW's grammatical development

4.6.1.1 Affirmative sentences: expressing INFL

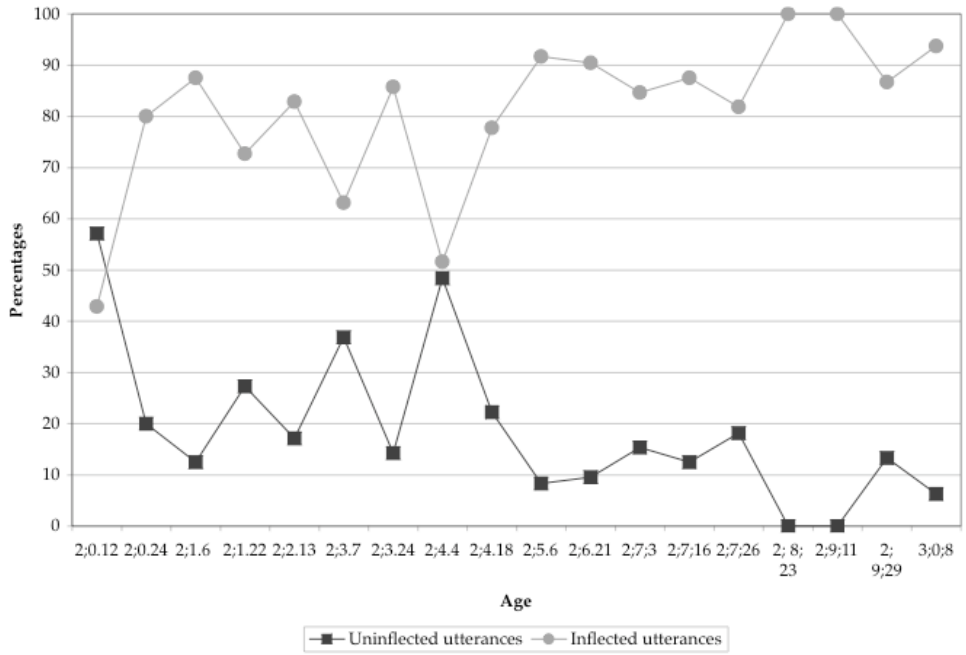
CW produced 106 utterances with no inflectional information and 340 with some sort of inflection. 31 (10%) of her utterances had an orphan

morpheme[31] and 309 (90%) utterances were produced with a correctly inflected verb, bearing the agreement affix –s.

In Chart 1, we can see the progress in her use of inflected verbs as opposed to uninflected verbs in affirmative 3PSg contexts. Overall, she started producing a high percentage of inflected forms early on. However, around age 2;4, we observe a surge of uninflected forms, going from an average of 30% to 48%. After that, her use of uninflected forms declined significantly, as shown by the darker line.

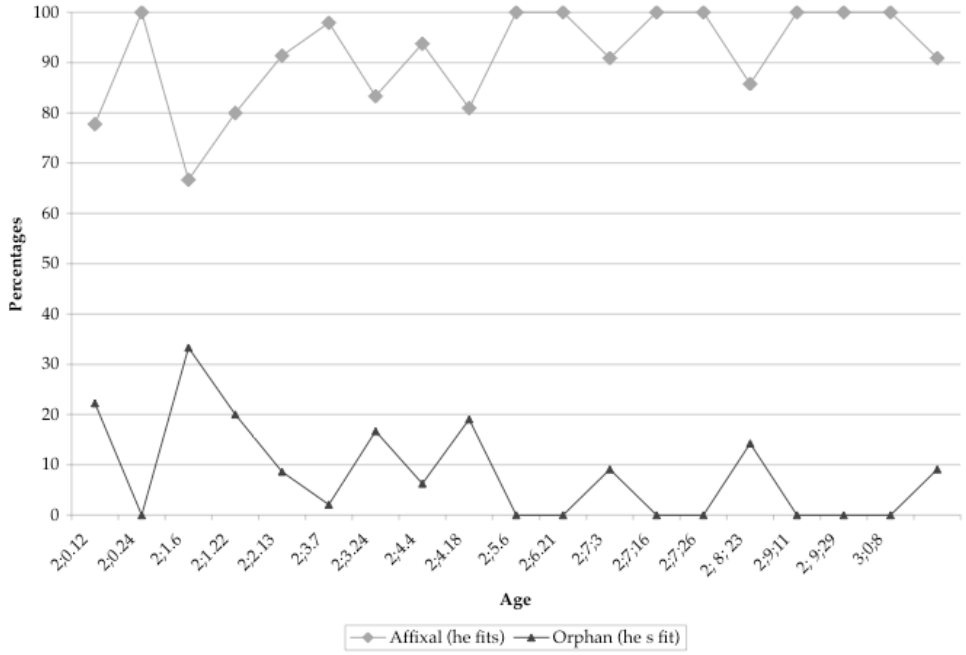
[31] I am including in this count, 13 utterances that had an orphan morpheme *and* an affix on the verb; that is, this child produced instances of *doubled* morphology. I will not attempt to provide a detail account for these cases, but I take them as instances of orphan morphology. Given the framework I embrace in this work, these examples can be understood as instances of movement with no deletion. See Tesan (2002) for an account.

Chart 1: CW's use of inflected forms in affirmative 3PSg contexts



Next, let us consider CW's inflected forms more carefully. CW produced 31 instances of orphan morphology (see Chart 2). Most of the non-adult orphan forms (tracked by the grey line) were produced before age 2;4 (the age at which we saw a shift in her production of uninflected forms as well). After that CW only produced 2 instances of orphan morphology.

Chart 2: CW's orphan and affixal forms in 3Psg affirmative contexts



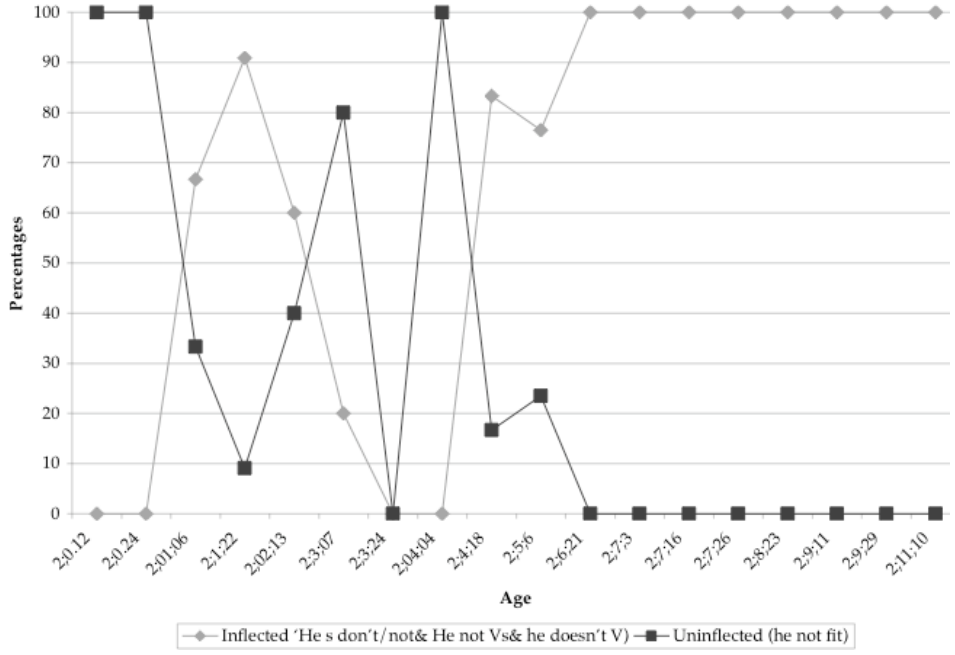
4.6.1.2 Negative sentences: expressing INFL

The use of inflection in negative utterances followed a progression similar to that observed in affirmative contexts. We collected 22 uninflected negative utterances and 67 inflected negative utterances. Structurally, CW produced two types of uninflected negative utterances: an uninflected verb preceded by the negative marker *don't*, and an uninflected verb preceded by the negative marker *not/no.* A great deal of variation was attested in inflected negative utterances, I discuss the inflected patterns in the next section.

Initially, both uninflected and inflected overlapped as previously observed (see Harris and Wexler 1996). But around age 2;4, CW's negative

sentences underwent a qualitative change; at that point, the percentage of inflected utterances went up to a steady 100%, as shown in Chart 3 below.

Chart 3: CW's negative inflected vs. uninflected utterances



Once again, the sharp decrease in the production of non-inflected forms suggests that the cause may not be related to a cumulative process of learning as predicted by the constructivist account (in particular, see Tomasello 2003 and Wilson 2003). Instead, one could infer that the same underlying functional category is implicated in negative and affirmative contexts; that is to say, the production of inflection is not tied to a specific structure (e.g. affirmative vs. negative structures) as predicted by the constructivist approach. What is clear is that whatever the grammatical development involved in this grammar, the change is not gradual but quick.

4.6.1.3 The emergence of do-support in negative sentences

Finally, consider the different ways that CW used to express inflection in negative contexts. To realize the Neg category, this child produced two different types of negative markers: *not* and *n't*. Initially, *n't* was mostly accompanied by a bare *do* (i.e. *don't*), with the agreement affix realized elsewhere; otherwise, she used *not*. The realization of inflectional information in combination with negative markers gave rise to many different negative patterns.

In CW's data, I found three different variants shown in (64): (a) orphan inflection preceding negative markers *not* (and *don't*), (b) affixal inflection following negative marker *not* (and *don't*) i.e. *medial negation*, and (c) inflected do-support preceding negative marker *n't*. CW produced 14 instances of orphan inflection as in (64)a. Contrary to the predictions of the theory, CW also produced 9 instances of an affixed verb following a negative marker as in (64)b, (cf. Harris and Wexler 1996).

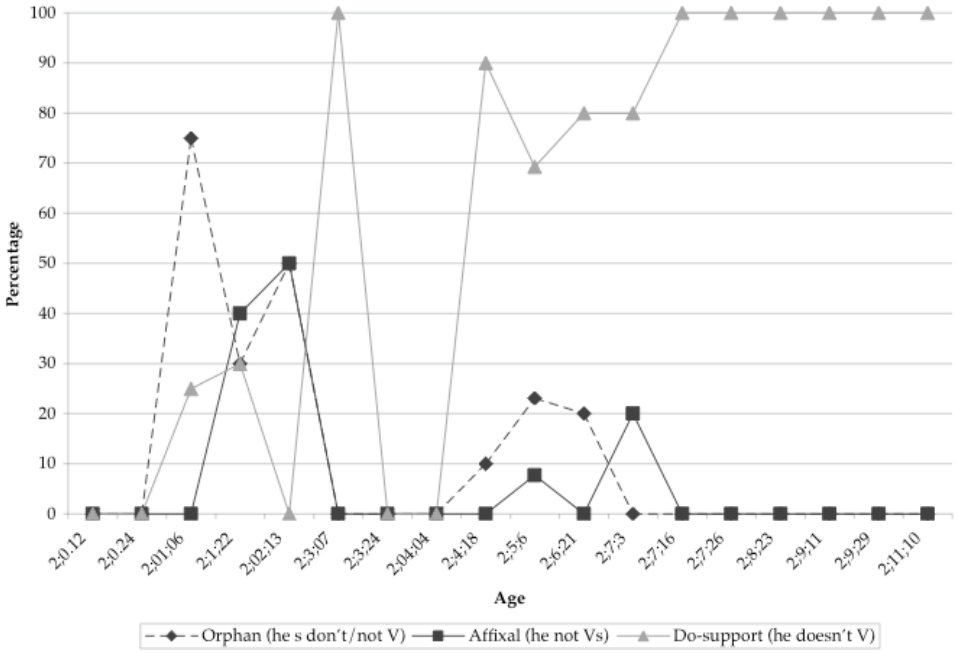
(64) a. No, he's not fit in there (2;1.6)

b. He not goes in that (2;1.22)

c. So it doesn't fall on your eyes (2;7.3)

In Chart 4, we observe that around 2;4 another significant change occurred. This change correlates with the increase in the production of inflected do-support (i.e. *does*), which became the preferred option, while her non-adult alternatives started to shrink away.

Chart 4: CW's negative inflected utterances



During this period, after 2;4, 41 negative utterances out of the 46 negative utterances produced had an inflected *do* In the previous stage, only 5 utterances out of the 21 produced were negated with an inflected *do*. The grey line in Chart 4 shows the increasing production of inflected *does*. Before this option starts its rise, we observe that the non-adult variants are preferred to the adult-like form.

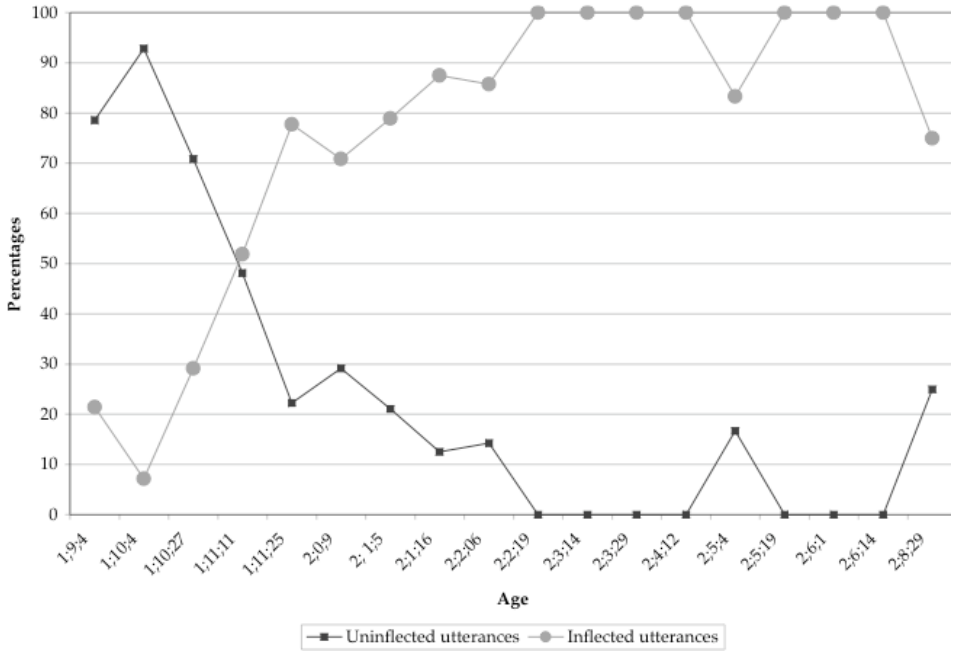
4.6.2 CM's grammatical development

4.6.2.1 Affirmative sentences: expressing Infl

CM produced 91 affirmative utterances with no inflectional information and 156 utterances with an inflected verb. In her case, we found only 7 instances of orphan inflection. That is to say, this child mostly kept her morphological hypothesis in line with the adult grammar, i.e. she only adopts affixation to express inflectional information.

CM started producing a high percentage of uninflected forms, however soon after the study started; around age 1;11, her production of inflected forms suddenly increased from 30% to 80% and higher.

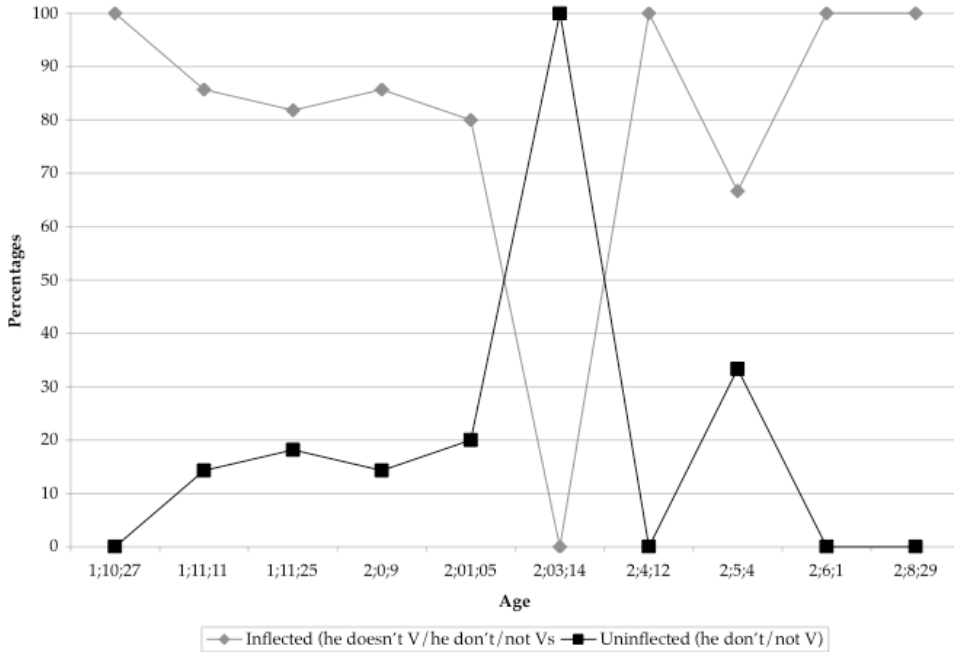
Table 5: CM's use of inflected forms in affirmative 3PSg contexts



4.6.2.2 Negative sentences: expressing Infl and Neg

We collected 51 negative utterances, of which 43 were inflected and 8 were uninflected. To realize inflection, CM produced two types of negative markers in uninflected utterances: *not* and *don't*. As shown in the chart below, most of her negative sentences were inflected from the beginning (the uninflected peak around age 2 should not be contradictory to the previous statement considering that she only produced one negative utterance, which happened to be uninflected).

Chart 5: CM's negative inflected vs. uninflected utterances[32]



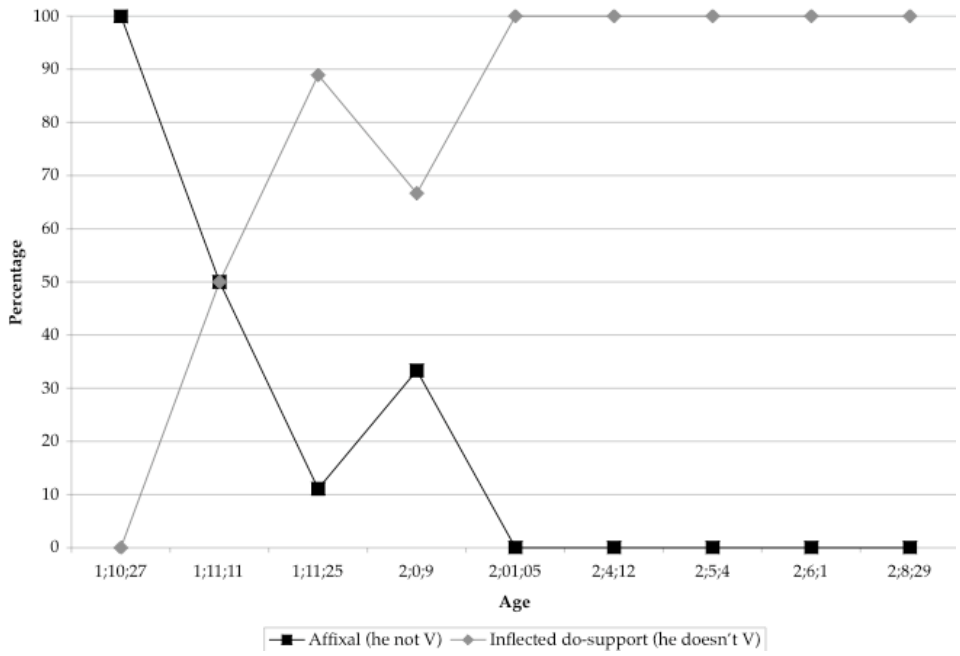
In CM's data, I found the two different variants shown in (65) below: (a) affixal inflection following negative marker *not* (and *don't*) (i.e. medial negation) and (b) inflected do-support preceding negative marker *n't*. CM produced 12 instances of medial negation (i.e. an affixed verb following a negative marker, cf. Harris and Wexler 1996), and 31 instances of the adult-like inflected do-support.

(65) a. He don't likes those pickles (2;0.9)

b. This one doesn't fit there (2;1.5)

[32] Sessions in which no instances of negative utterances were produced (i.e. the total equaled zero) were not included in this chart.

Chart 6: CM's negative inflected utterances



In Chart 6, we can observe that initially CM produces negative utterances that contained medial negation (affixal in the chart) preceded by a negative marker. Interestingly, at the same time that medial negation disappeared, CM's uninflected forms also disappeared (see §4.6.2.1 above). After this, she almost exclusively used inflected do-support to realize negation and inflectional categories.

Although the developmental patterns we just described are different in both CW and CM's grammars, three preliminary generalizations can be made. First, these children used patterns that do not match the input. On the other hand, the medial negation found in these two grammars so far does not satisfactorily reflect the inflectional properties of adult Infl. Lastly, in both cases

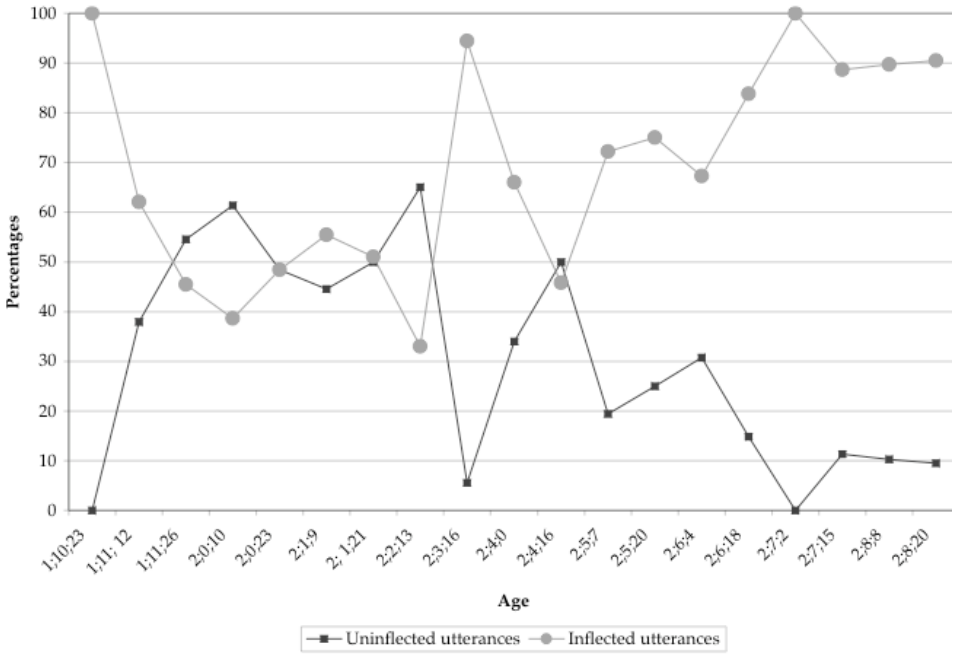
we find a correlation between the use of inflected do-support and the decline in the production of non-inflected forms.

4.6.3 SL's grammatical development

4.6.3.1 Affirmative sentences: expressing Infl

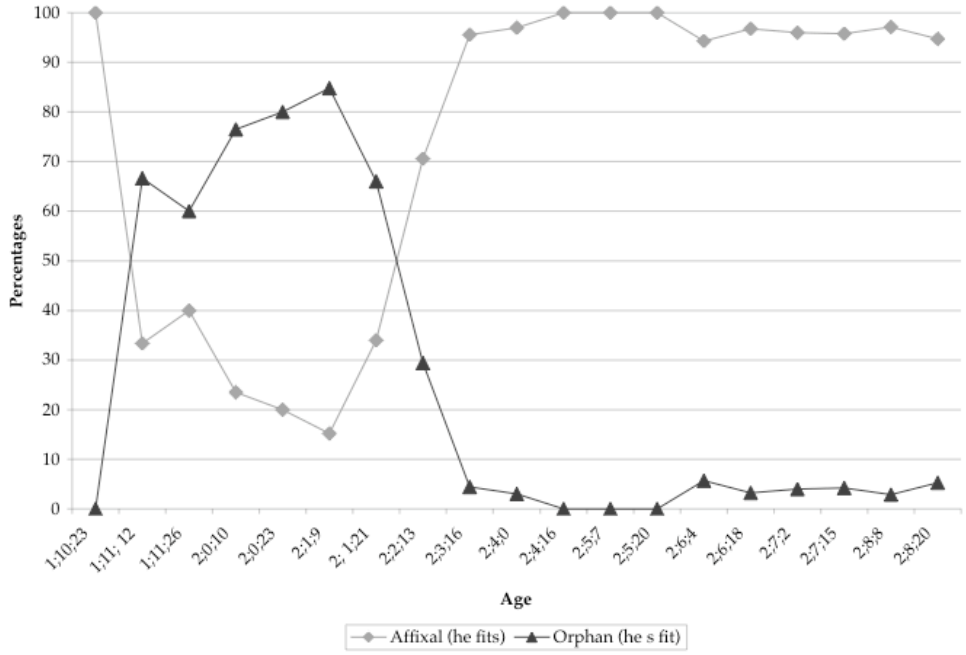
SL produced a total of 860 3PSg affirmative utterances: 562 were inflected and 298 were uninflected. In Chart 7 we can observe the progression of inflected forms in SL's speech. Although at the beginning of the study she started using a high proportion of inflected forms, the proportion of uninflected forms was higher than the proportion of inflected forms for over a period of two months (from age 1;11 to 2;3). Around age 2;3 we see a sudden increment in the realization of inflected forms, with the concomitant decline of uninflected forms.

Chart 7: SL's use of inflected forms in affirmative 3PSg



SL also produced 135 utterances with orphan morphology, and 427 with an inflected verb. Again, we found that the production of orphan inflection was limited to the earliest sessions in the study, as shown in Chart 7. Around age 2;3 (shown in grey in the table), orphan forms started to disappear after being significantly higher than suffixed forms (cf. session at age 2;1.9 when orphan inflection was up to 82% of orphan morphology).

Chart 8: SL's orphan and affixal forms in 3PSg affirmative contexts



4.6.3.2 Negative sentences: expressing Infl

We found 50 negative utterances in SL's data files: 21 contained some kind of inflectional information, and 29 were uninflected. She mostly used one negative marker, *n't*, which was preceded by an uninflected *do* (i.e. *don't'*), and eventually she used inflected do with the negative marker *n't* (i.e. *doesn't*). In addition to this, SL used orphan Infl along with bare *don't* as in (66)b. For her uninflected negative sentences, she exclusively used bare *don't* (66)a.

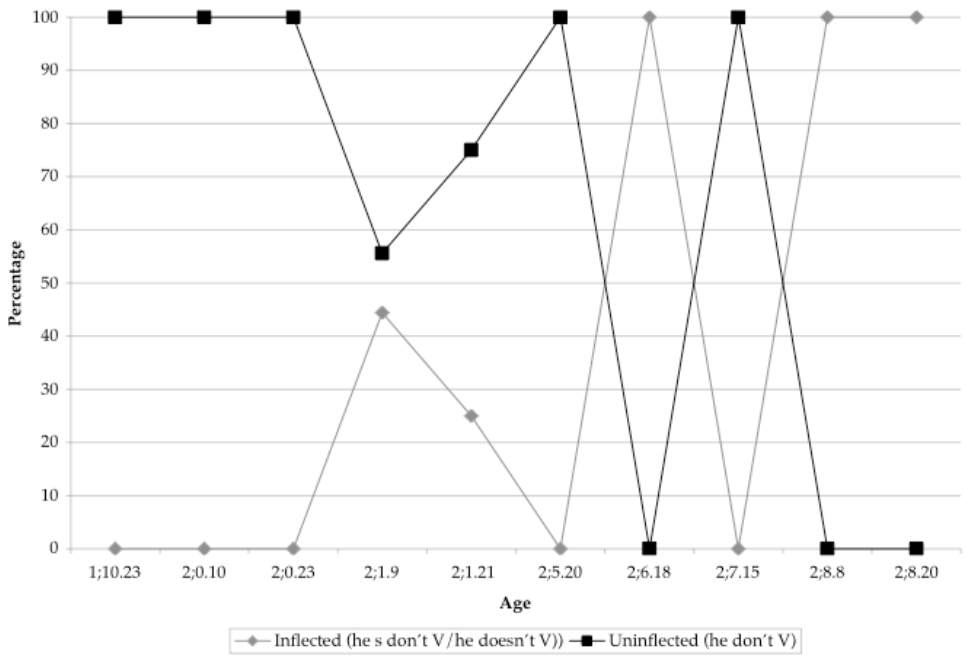
(66) a. Mommy don't have tail (2;1.9)

b. Spider s don't fit train (2;1.9)

As shown in

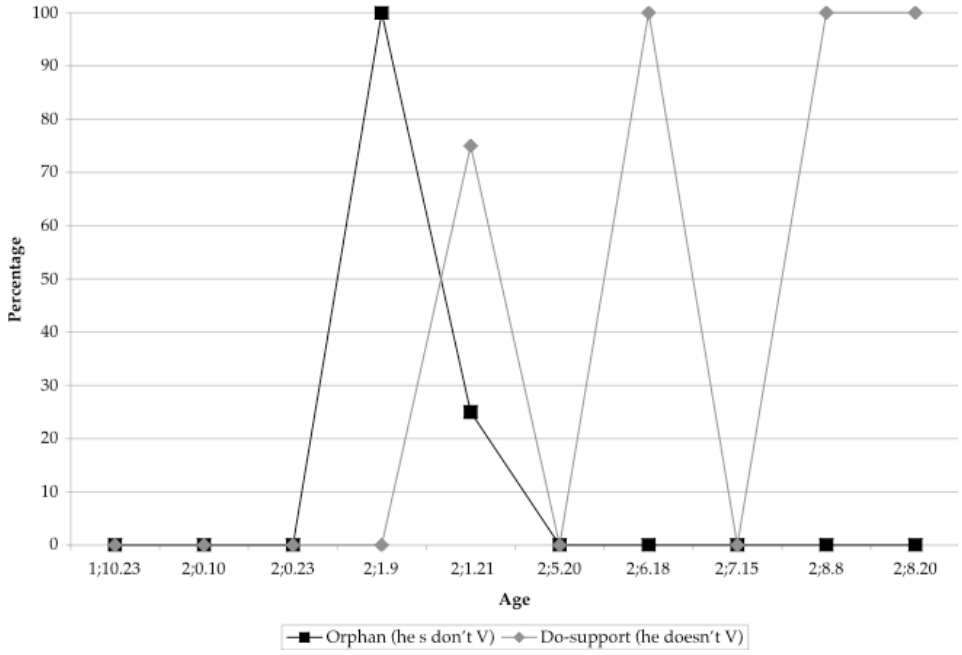
Chart 9 below, the development in the realization of inflection in negative utterances is not as clear-cut as with the previous children. We observe a long period (from 2;0 to 2;8) where inflection is not consistently realized in her negative utterances. Moreover, the tendency we observed in the previous children's grammars (that showed a correlation between the emergence of inflected do-support and the decrease in the use of uninflected forms in affirmatives) does not hold here. The decline of uninflected forms at age 2;3 (as shown in Chart 8 by the darker line) is not followed by an increase in the realization of agreement information in her negative utterances.

Chart 9: SL's negative inflected vs. uninflected utterances



Nevertheless, the expression of negation by means of orphan inflection and bare *don't* followed the trend found in the other children: the production of non-adult forms precedes the production of inflected *does* as shown by Chart 11. 9 of her inflected negative utterances had an orphan Infl and 12 of them had the inflected do (i.e. *does*).

Chart 11: SL's negative inflected utterances



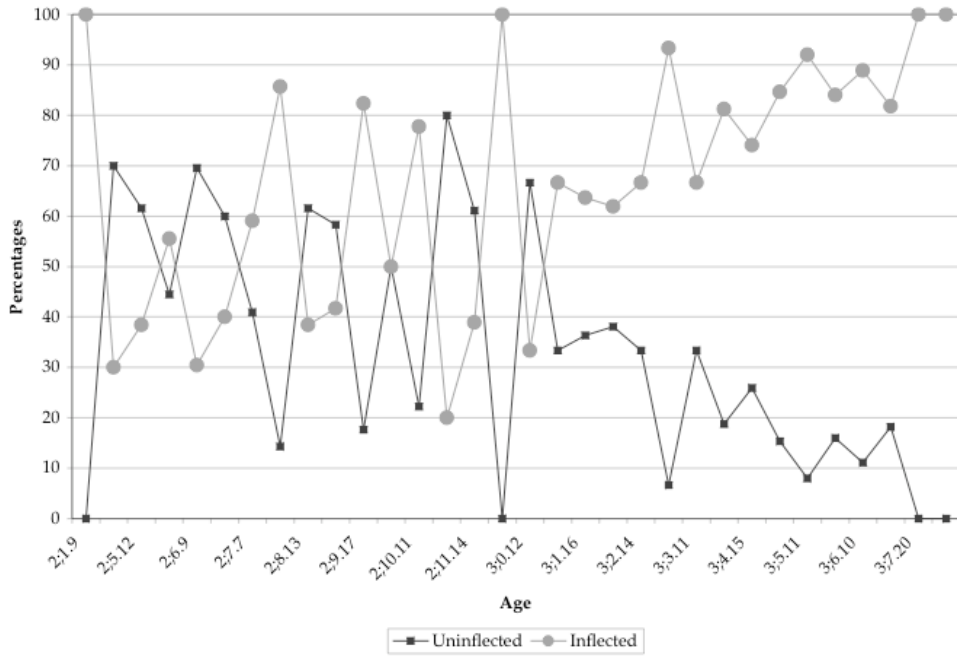
4.6.4 SF's grammatical development

4.6.4.1 Affirmative sentences: expressing Infl

SF produced 473 affirmative sentences, 312 were inflected and 161 were uninflected. In Chart 12, the reader can follow the grey line which shows his development in the use of inflected verbs. Both finite and non-finite options were

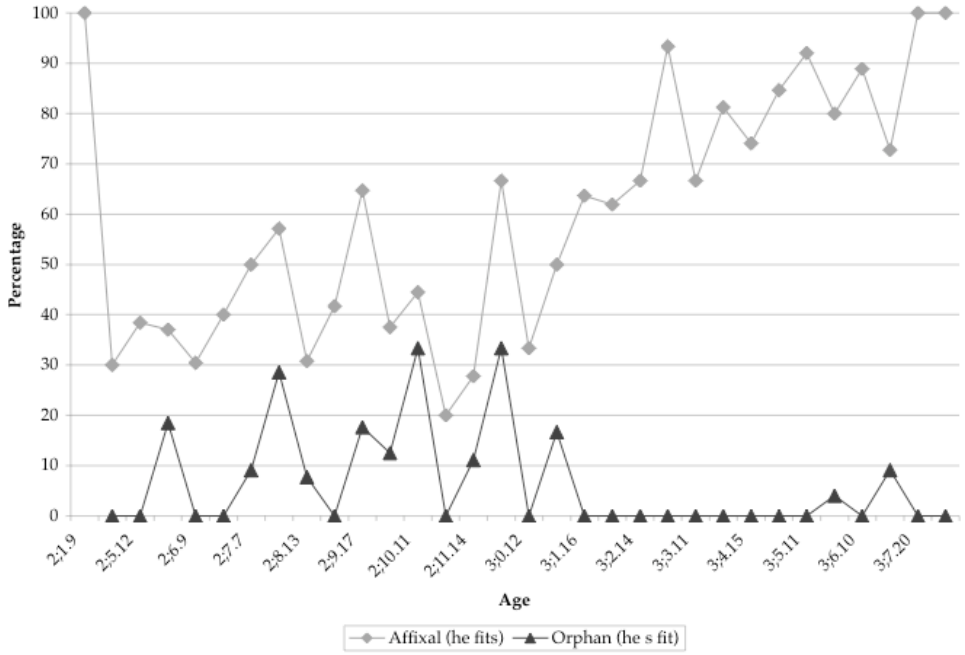
produced for a long time. However, one can observe that the trend takes a sudden turn. At 3;0 years of age, SF's inflected forms started to increase significantly while uninflected forms started to decline as well, if compared to previous sessions.

Chart 12: SF's use of inflected forms in affirmative 3PSg contexts



SF used two different mechanisms to realize Infl. Out of 312 inflected utterances, 284 were produced by inflecting the verb with the agreement morpheme –s, as in the adult language. In addition to affixal Infl, SF also produced 28 orphan Infl utterances. When we charted these results in a timeline, we could see that –although the orphan option was produced alongside the affixal option- orphan Infl disappears around the time his uninflected forms start to decline, a trend that we have seen before in our other child subjects.

Chart 13: SF's orphan and affixal forms in 3Psg affirmative contexts



4.6.4.2 Negative sentences: expressing Infl

We collected 307 negative utterances from SF's data files; 191 bore inflectional information, whereas 116 were uninflected. SF produced two types of uninflected negative utterances: (a) an uninflected verb preceded by the negative marker *n't*, attached to the bare form of *do*, and (b) an uninflected verb preceded by the negative marker *not*. In his inflected negative sentences, we found: (a) medial negation, (b) orphan Infl preceding bare *don't*, and eventually (c) inflected do-support.

(67) a. He don't like you (3;0.12)

b. He not have a tail (2;11.14)

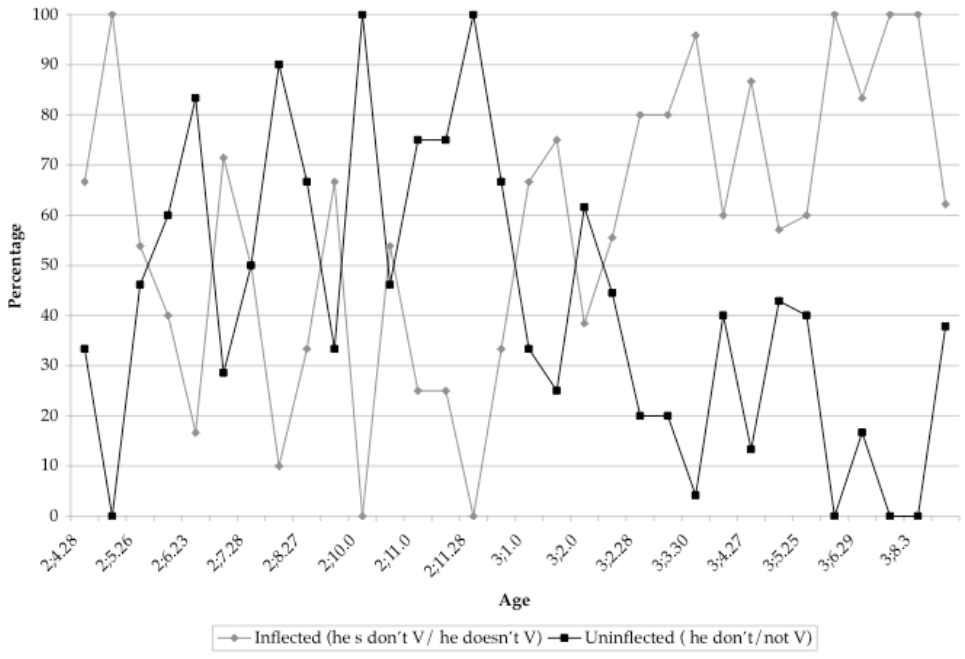
(68) a. It not sticks (3;2.28)

b. It s not go there (3;2.14)

c. That doesn't have spots (3;7.20)

Both uninflected and inflected forms were produced simultaneously for a long period of time, as shown by the black and grey line respectively. For over ten months, SF produced both options to varying degrees. More interesting is the interaction between Infl and Neg in his grammar.

Chart 14: SF's inflected negative utterances

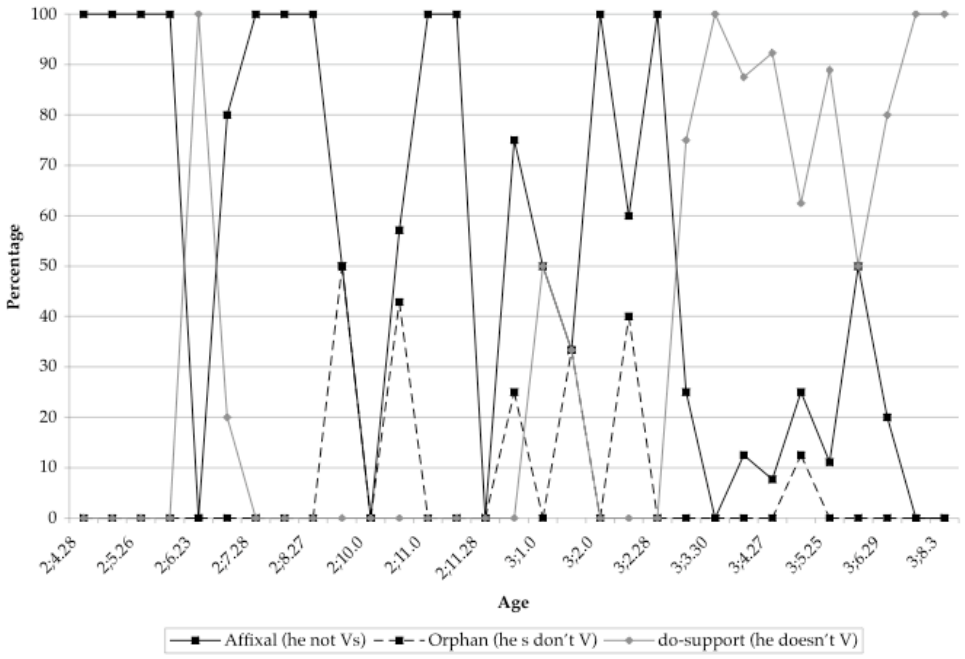


4.6.4.3 The emergence of do-support in negative sentences

By looking at SF's negative sentences in

Chart 15, one can observe that he initially lacked do-support altogether. Before age 3;0, he produced only two instances of inflected *does*, then, over a period of 4 months (from 2;8 to 3;1), SF produces a substantial amount of medial negation, where the negative marker precedes an inflected verb. During this pre-do-support period, we also find instances of orphan inflection in negative sentences. However, he only produced 10 such utterances, representing 5% of the inflected total (shown by the dotted line).

Chart 15: SF's use of inflection in negative contexts



We observe that the emergence of do-support –that is, the moment when this option becomes the most productive in comparison- happened around his

third birthday. Not surprisingly, around his third birthday, the uninflected forms started to disappear, as happened with the other children who participated in this study.

4.7 Summary of results

I) An **orphan agreement** element was produced consistently by some of our subjects. The orphan agreement element surfaces to the right of the subject, but it is not attached to the verb. SL used it consistently. CW, SF also used this option to a lesser degree. CM produced it very sporadically.

II) **Inflected *does*** is almost absent in the initial stages. Alternatives way of realizing Neg and Infl were used instead.

III) **Neg** was realized by three different negative markers: bare *don't*, *not* and *doesn't*. These markers did not necessarily overlap in time, especially *doesn't,* as noted above. SF did not produce any utterance with *not*. Most of her negative utterances contained bare *don't* and eventually *doesn't*. The rest of the children used both *don't,* and *not* while *doesn't* was absent.

IV) CW, CM and SF produced instances of **medial negation**, where an inflected verb followed a negative marker. This option, in particular, was predicted not to occur by Harris and Wexler (1996)

V) A correlation was found between the **emergence of *does*** in negative sentences and the **decline in the use of uninflected forms** in affirmative 3PSg in all our subjects.

4.8 Conclusions

The Constructionist approach to language argues that abstract syntactic knowledge is absent from the early stages of language acquisition. The production of inflected forms by children, along with uninflected forms, is the consequence of item-based learning, with no underlying abstract knowledge of the syntactic details of a derivation.

One of the constructivist expectations is that children's initial utterances match the input. Lacking language specific knowledge (i.e. UG), children should make few overgeneralization errors before they reached certain level of abstraction (around age 3). Hence, *doesn't* should appear in children's utterances early. The relative absence of *doesn't* from the earliest sessions suggests the contrary. Instead of using *doesn't*, the adult form, children adopted alternative forms such as *don't* and *not*.

One may consider the possibility that *doesn't* is not present in the input data, and thus, it is bound to take longer to acquire. However, there are two problems associated with this premise. First, if children learn *doesn't* by preemption (i.e. expecting to hear *don't*/*not*, they hear *doesn't*), it is not clear how learning *doesn't* (by preemption) has a correlation with the decline in the number of uninflected forms in affirmative and negative utterances, or any of the other

non-adult forms. Learning *doesn't* should eliminate the use of *don't*/*not* in negative sentences. Second, one would also expect to find overgeneralization errors after *doesn't* is learned. Given that children are producing medial negation with an inflected verb following *not*, we could expect to find an inflected verb following *doesn't*. I only found 2 such examples, reproduced below.

(69) a. He doesn't stand ups (CW 2;4.18)

b. It doesn't has spots that one (SF 3;7.20)

In addition, it is not clear how the non-adult *orphan morpheme* found in children's data could be explained if one assumes that children's hypotheses are closely tied to the input. Take, for instance, (70). One could claim that the child has extracted the formula [subject s] as a chunk from progressive contexts as in (70)b. However, no parallel conversational context exists in which the expression [SUBJECT s] appears with an inflected (lexical) verb in the input; the verb always appears inflected with the progressive affix *-ing*. Moreover, the situational context that applies for uttering (70)b does not transfer to (70)a, unless we assume that children cannot identify the meaning distinction between progressives and habituals. According to Tomasello (1995:145), children can generalize from pairs like [eat/eats] since they belong to "the open class of main verbs which might be expected to generate analogies among its members (…)." However, they cannot generalize across other categories since auxiliaries are "not from a coherent word class at all and thus analogies to other words or word classes are not to be expected."

(70) a. Everybody s eat pizza

b. Everybody's eating pizza

So the question is: what is the adult model that serves as the model for (71)a below? Maybe, (71)b; but this is problematic because (71)a does not mean that the event is taking place; furthermore, it is unlikely that children ever encounter such expressions, as the use of progressive inflection is not compatible with a habitual meaning.

(71) a. Pooh s like pizza

b. *Pooh's liking pizza

Children produce structures that do not match the input. Thus, I am led to conclude that the data presented in this chapter do not suggest that children's hypotheses are conservative. In fact, we observe a generalization that runs deep, underlying two different construction types. Moreover, those generalizations emerge earlier than expected by a usage-based model, suggesting that children have access to syntactic notions early in their language development.

On the other hand, the evidence discussed here does not support some of the generativist claims either. According to Wexler (1994, 1998), children acquire the inflectional parameter early, i.e., children know how to realize inflectional information. The data shows that none of these children works with exactly the same set of morphological hypotheses as the adult grammar. We have seen that

children may express Infl by means of an orphan agreement instead of a verbal suffix. We have also seen that Neg does not establish the same type of relation with the agreement element as in the adult grammar. In the adult grammar, the presence of Neg blocks the possibility of merging the verb with the agreement element and triggers the insertion of inflected do-support. This is not necessarily true in some child grammars. First, we have noticed the initial absence of inflected *does* from all children's speech. Second, we have found children use different combinations of negative markers and inflectional items, which result in very different structures from the adult grammar (cf. medial negation, orphan Infl and bare *don't*, etc.). Thus, we are led to conclude that the parametric value for inflection is not fully determined at this stage.

Lastly, the production of these forms resists explanations such as Phillips' (1995) performance account. It is unlikely that the orphan forms are performance-driven errors (which should disappear when the child's system becomes more proficient) because these forms cannot be considered default forms (cf. with performance deficit claims that explain optional infinitives, see §2.3.6). In most cases, performance deficit models predict the omission of material. However, in the case of orphan morphology, we observe the insertion of material into a place that does not correspond to the properties of the language (purportedly already known by children).

In this chapter, we have seen examples of children's exceptional ways of expressing inflectional information and of expressing negation. These non-adult structures clearly show that children's grammars have properties that are not

found in the input. My next goal is to show that those properties are consistent with UG.

5 Inflection in child English

The Linguist: -(...) Contrary to what happens in most messy systems out there, for which slight changes in a simple input produce drastic results in the output, here the [linguistic] input can be vastly different, yet the results in the output are minimally different in core structural aspects.-
Juan Uriagereka 1998:26

5.1 Introduction

In this chapter, I consider the parameter-setting model of language acquisition. I assume that children's non-adult forms reflect a grammar, constrained by the principles and parameters of UG. I adopt the continuity hypothesis (Crain 1991; Pinker 1984), which states that children's intermediate grammars differ from the adult grammar as natural languages differ from each other. Given that children's *mistakes* reflect their grammar, they should be consistent with properties found in other languages.

In the previous chapter, I described some non-adult ways of realizing verbal morphology in negative and affirmative contexts. The analysis of the data has led us to the conclusion that child generalizations emerge earlier than expected by a usage-based model (contra Tomasello 2003). In turn, this suggests that these children have access to syntactic notions early in their language development but that their knowledge is not adult-like (contra Wexler 1998).

I argued that some children used an orphan –or unattached- morpheme to realize agreement 3rd person features. Whereas adults inflect lexical verbs for agreement in 3rd person singular contexts in the simple present tense, as in (72)

below, some of the children used a disassociated morpheme to express agreement information, as in (73).

(72) The bear likes the cake

(73) The bear s like the cake

The goal of this chapter is to explain the source of the above non-adult forms. I adopt a *parameter setting model* (cf. Hyams 1984, Thornton 1990) as described in §2.3.6.3 to explain the development of both Infl and Neg in child grammars.

5.2 Inflectional models and language acquisition

5.2.1 *Infl* in natural languages

I adopt the *hybrid* model proposed by Lasnik (1995a), which provides the necessary theoretical ingredients to successfully account for the (child) inflectional variation found in our data set. According to Lasnik (1995a), Infl can take one of two values: featural or affixal. The first Infl type –featural- triggers overt verb movement, whereas the second Infl type –affixal- only requires that it attach to a verbal element as a morphological requirement (and thus it is not a syntactic requirement). I pair this proposal with the assumption that the morpheme *–s* can initially be categorized as carrying a verbal feature [+v], much like raising auxiliaries, to argue that (some) children initially assume a uniformly featural INFL.

Lasnik (1995a) proposes that the Infl category in natural languages takes one of two values: *featural* (74)a or *affixal* (74)b.

(74) Infl Parameter

(a) When INFL is + *featural*, a fully inflected verb is inserted into the syntax, and raises to check features in INFL: French, Spanish, English modals and auxiliary verbs (Lasnik 1995a)

(b) When INFL is + *affixal*, the verb is associated with its inflection in the morphology: English main verbs, Swedish verbs (in non V2 contexts) (Lasnik 1995a; Vikner 1995)

Accordingly, a featural value (74)a triggers verb-movement to Infl, whereas an affixal value (74)b does not establish a relationship with the verb syntactically, but morphologically, by means of affix hopping. The first type of Infl can be characterized as a bundle of uninterpretable features that, once inserted in the derivation, triggers movement of the corresponding features. An affixal inflectional is inserted directly under Infl, with no further syntactic requirement.

Ideally, a category that triggers feature checking –in this case featural Infl- should attract only the feature F that checks the corresponding features of the target. When a featural Infl is selected, the system seeks to move enough material for conversion. In natural languages, very few cases of pure feature movement (without concomitant pied-piping of the whole category) are attested in human languages; in most cases, feature checking results in *category* movement such as

verb movement. According to Chomsky (1995: 262-263), category movement is forced by periphery conditions: words whose features are scattered "may not be subject to [PF] rules, in which case the derivation is cancelled." As a result, languages that select a featural Infl generally move the verb category to Infl.

On the other hand, there are some indications of pure formal feature movement in languages. For instance, according to Roberts (1998) English auxiliaries 'have/be' are cases of pure feature movement: lacking theta roles (cf. Pollock, 1989), auxiliaries are conceived of as bundles of formal features, which move in their entirety to a higher position. Another instance of feature movement can be seen in clitic-climbing phenomena in Romance. Romance clitics are the realization of the ϕ-features of their contentful nominal doubles. For instance in (75), the determiner clitic element 'los (them-CL)' agrees in person, number and gender features with the direct object DP 'a los críticos (to the critics).' As discussed in Uriagereka (1995), clitics move to higher peripheral positions, to a head that encodes "reference to the speaker, the addressee, or the world" to be "capable of licensing its dependent pro-nominal (pp. 93 and fn 35)" as in (76).

(75) A los críticos, Juan los detesta
To the critics$_i$, Juan them-CL$_i$ hates
The critics, Juan hates them

(76) Los$_i$ detesta t$_i$ pro$_i$ mucho

5.2.2 Orphan Infl as clitic movement

We have seen that in some languages, feature movement is possible. In this section, I would like to argue that children's orphan inflection can be accounted for in these terms. Thus, I propose that the orphan agreement morpheme be interpreted as a clitic-like element. Furthermore, I propose that some children may interpret the agreement morpheme as a clitic element that has nominal characteristics (ϕ-features) and verbal characteristics as well. This is compatible with some examples reported in Uriagereka (1995). In Spanish, some clitics show characteristics of 3rd person verbal agreement: the impersonal non-specific clitic *se* in (77) can be seen as a "step away from agreement--instantiation into the morphology of the verbal paradigm (pp.93)."

(77) Anoche se bebieron muchas cervezas (Uriagereka 1995:(6a))
Last.night SE bebieron muchas cervezas
Much beer drinking took place last night

With this in mind, I interpret the orphan agreement morpheme *–s* as a type of clitic that shares properties of the nominal system and some properties of the verbal system. More concretely, I assume that the *step away* from the verbal system is formalized in terms of a [+v] feature, which gives the *–s* clitic its checking capabilities, while retaining the person and number properties of a nominal element.

We might further hypothesize that once the [+v] feature is lost, a clitic is reinterpreted as an affix, becoming an element of the verbal system. That is, a nominal clitic may eventually become a verbal element, after undergoing a transition stage in which the element sits in a sort of intersection between the nominal and verbal systems. At this point, this is nothing more than a stipulation, but I believe that the reason for the direction of this change might be due to Case considerations: since the clitic lacks case capabilities, it is interpreted as a verbal element and not a nominal.

In the same way, we may consider the morpheme *–s* in (78) to be a step away from becoming an affix of the verbal system. In other words, it has the phonological and morphological properties of a *weak clitic-auxiliary*, since it still bears a [+v] feature. Compare the Spanish example above with SL's example below, in (78). Although the example above involves *object* agreement, and the child's example involves *subject* agreement, both elements carry ϕ-features, which agree with a second nominal element (in this case, the subject).

(78) Piglet$_i$ s$_i$ fit in house too (SL 2;0.23)

Once we assume the possibility that the orphan element is a clitic bearing a [+v] feature and person features, consider next the logical possibilities that result from a hybrid system of verbal morphology in combination with the categorization of the morpheme *–s* as a clitic. One of the learner's tasks is to determine what type of Infl (featural vs. affixal) would get her closer to the target, and which lexical elements will realize and satisfy the properties of Infl.

English-speaking children cannot know, *a priori,* that Infl is a hybrid category. As we discussed in chapter 3, the Infl category in English is realized by both a featural Infl (which attracts verbs) and an affixal Infl (which requires a morpho-phonological host, with no apparent syntactic conditioning). Thus, it is possible that children may hypothesize the wrong parametric value for a given lexical element. Thus, we can understand orphan morphology as the consequence of (mis-) setting the Infl parameter to the featural value.

5.2.3 Parameter setting

In principle, children can choose any given value available in UG for a particular parameter; positive data will inform them if re-setting is necessary. In this view, the parameter discussed in (74) gives us two possible grammar variants, listed in (79):

(79) a. The child initially chooses an *affixal* INFL for auxiliaries and lexical verbs.

b. The child initially chooses a *featural* INFL for auxiliaries and lexical verbs.

The first scenario predicts a grammar that uniformly selects an affixal value for INFL for all verb types; in this case, there is no need for feature checking and no (verbal) feature-movement is triggered. INFL is projected from

a morpheme, [-s] or [∅], which later lowers to the verb, as in (80)a ((s̶)/ (∅̶) indicates that the morpheme has been lowered by morphological merge).

(80) He $[_{INFL}(\text{s̶})_{[aff]}]$ like-$s_{[aff]}$ the apple

If a child selects an affixal option for INFL as a unique value, we expect this child to consistently produce affixed lexical verbs. In general, children produce a high number of inflected verbs suggesting that children select this option early on. Clearly, this is the case for CM's grammar: when Infl was realized, the affix *–s* was attached to the lexical verb (in affirmative and negative contexts). Only 7 utterances containing a disassociated agreement morpheme are found in her speech, representing only 4% of the total number of finite 3PSg sentences she produces (out of 156 inflected utterances). Thus, one can conclude that this child selected the affixal value for Infl quite early.

What is the consequence of an affixal value for auxiliaries? If a child assumes a uniform affixal value for Infl, auxiliaries, contrary to adult English, do not raise to Infl, but Infl lowers, as in (81)a. Assuming that *not* marks the edge of VP, (81)b could be underivable as Neg blocks affixation.

(81) a. He $[_{INFL}(\text{∅̶})_{[aff]}]$ is$\text{∅}_{[aff]}$ eating the apple

b. *He $[_{INFL}(\text{∅̶})_{[aff]}]$ not is$\text{∅}_{[aff]}$ eating the apple

If a child assumes that auxiliaries select an affixal INFL, utterances like (82) in the positive data should immediately inform children that modals and auxiliaries raise out of the VP past negation, demonstrating that auxiliaries select a featural INFL.

(82) He is not eating the apple

For auxiliaries, then, word order can help children reset the affixal value to the adult featural value. As long as children correctly categorize auxiliaries as verbal elements, their ordering with respect to negation should inform children that these verbs do not stay inside the VP. This can explain why we do not attest utterances like (83) in *any* of the four children in our study. To conclude, a child that selects an affixal value for all the elements realizing Infl should quickly reset the value for auxiliaries given the word order facts of English.

(83) #He not can eat the apple

The alternative path, that is selecting a featural Infl, presents children with a trickier path to navigate. On the second scenario given by (79), selecting a featural value for Infl, requires verbal features to raise to the Infl node to check its features. Infl is projected from a bundle of functional features that need to establish a checking relation with verbal features. If the learner selects a uniform featural value for Infl, auxiliaries can move to Infl (past negation), checking off uninterpretable features. However, a featural value for Infl could be problematic

for lexical verbs as the featural value is usually associated with verb movement languages. But consider the following: assuming that the most economical movement operation is one that moves only necessary features (Chomsky, 1995b), verb movement is not necessary if there is another category that can check the features of Infl. Assuming that the orphan element is a *weak clitic-auxiliary* [-s], which bears ϕ-features and a [+v] feature, a featural Infl could then be checked off without the need to move the entire verbal category. So this grammar generates (84)a where [s] has moved to the INFL position on a par with auxiliaries as in (84)b.

(84) a. He $[_{INFL}\ F_{(3sg\text{-}Pres)}]\ [_{VP}$ like s the apple]→
He $s_{[F]}$ like the apple

b. He $[_{INFL}\ F_{(3sg\text{-}Pres)}]\ [_{VP}$ is eating the apple] →
He $is_{[F]}$ eating the apple

Hence, I consider the instances of orphan morphology found in CW, SL and SF's grammars as the consequence of a featural (mis-)setting for the Infl parameter. Once we understand the production of orphan morphology as the consequence of missetting a parameter, resetting is expected, bringing the child's hypotheses in line with the English adult grammar. Following the discussion in the previous chapter, we saw that the orphan forms disappeared as the adult affixal form became predominant in all subjects. This rapid change can now be explained as a change in the parameter value from a featural to an affixal value.

The next consideration we need to explore is the source of this alternation between two different inflectional elements. We have observed that children alternate between these INFL heads: some of their verbs bear the affix –s, and some of their verbs appear along a disassociated agreement morpheme, which I have characterized as a weak clitic auxiliary specified for person, number and a [+v] feature. Following the discussion above, the data lead us to assume that children may categorize the morpheme *–s* as two different morphological items: a clitic-like element and a verbal affix. This immediately raises two questions: why do children posit two different morphological items for what it is expressed as one morpheme in the adult grammar and how do child grammars expunge that option (assuming that children eventually arrive at the correct set of properties for the INFL heads)?

I will argue that the answers to these two questions lie in the interaction between Infl and another functional category: Neg. The degree to which these two functional categories interact in natural languages vary along certain parametric options, which I discuss next. I claim that the alternation between the two types of Infl heads is a syntactic consequence due to the interaction between the two functional heads Infl and Neg.

5.3 Summary

In this chapter, I explored the possibility that children's inflectional assumptions are compatible with attested properties in natural languages, namely Lasnik's (1995a) Infl parameter, supporting the idea that children draw

from the properties encoded in UG to form their hypothesis. I proposed that the attested orphan morpheme found in the other three children was the consequence of a featural Infl value. We found that children's patterns of development are consistent with the hypothesis that children may initially select one of two values for Infl: affixal or featural.

We observed that one subject, CM, did not use orphan morphology productively. Her only way of realizing inflection was through affixation. CM, hence, selected an affixal value for Infl, and did not need to change the value. We also observed that the featural value is selected by some children. In particular, SL consistently selected featural Infl, which resulted in the realization of agreement information by means of the orphan morpheme. If this is correct, we can assume that there is no default value (in the sense of Hyams 1984) associated with the Infl parameter.

6 Sentence negation in child English

The Other: -But you see, that's is exactly what's found in systems arising at the edge of chaos, when it "collapses" into order! (…) Hence, if what you're saying about language is true, its structuring process must be able to ignore the disarray it gets for input, and then of course we must ask what in the system allows that result.-

Juan Uriagereka 1998:26

6.1 Introduction

Let us consider now the negative data presented in chapter 4 in the light of the parametric account offered in §3.3. Assuming that children's grammars may differ parametrically from the grammars of adult speakers, it is logically possible that some children may initially select a non-target value for the negative markers *not*, *n't* and $ø_{neg}$.

We observed that negation was not necessarily realized as in the adult grammar. Some children produced the so-called medial negation –namely, an inflected verb followed a negative marker, shown in (85). Another non-adult way of realizing negation is shown in (86), where the orphan Infl morpheme precedes a bare don't.

(85) The bear not fits

(86) The bear s don't fit

In §3.3, I proposed that two different morpho-syntactic values can be associated with the Σ_{neg} head, depending on what element is selected in the initial array: featural Σ_{neg} or affixal Σ_{neg}. The affixal value is realized by the negative markers (*not*/*n't*) in English, and the featural value is realized by a null morpheme $ø_{neg}$ that attracts an interpretable [+neg] feature, which can be satisfied by merging an adverb specified for negation (e.g. *never)* or by raising the [+neg] features of a negative quantifier (e.g. *nothing*). I showed that some Scandinavian languages select a featural morpheme for negation. Given the affixal nature of Infl and the featural nature of Σ_{neg}, Swedish is a language that generates inflected medial negative sentences as in (87).

(87) …att jag inte har gett boken till henne
that I not have given the.book to her (from Sells 2000:2, (3c))

Assuming the formal values *featural* vs. *affixal* correctly describe the mapping of Σ_{neg} and its corresponding markers, we can now consider the non-adult negative forms discussed in our previous chapter as parametric variants. As with the Infl parameter, children may start with either one of the settings specified in (88).

(88) Neg Parameter

a. Featural Neg (realized by $ø_{neg}$ in adult language)

b. Affixal Neg (realized by *n't*/*not* in adult language)

6.2 Inflected medial negation

The first case I will discuss is the unpredicted inflected medial negation, as exemplified in (89). Recall that in the literature, such examples are considered to be ungrammatical because the inflectional features cannot associate with the verb across the negative head *not* without causing a violation of the Head Movement Constraint (see §3.3 for details). However, we have observed young children freely producing such examples.

(89) It not opens

Assuming that children do not know before hand which morpheme realizes which head, it is possible that children initially map *n't* to the affixal head, but mistakenly map *not* as a negative adverbial. Thus, instead of bearing a [+affixal] feature, *not* bears an interpretable [+neg] feature. The specifier *not* can satisfy the featural requirements of $ø_{neg}$, as well as *never* can in the adult language. If that is the case, then the child utterance in (89) follows. As the negative marker occupies [spec, Σ_{neg}], affix hopping can apply freely (as shown in

(90)), similar to the Swedish language. The recalcitrant absence of inflected *do*-support from the earliest stages is therefore predicted.

(90) a. $[_{NEG} \varnothing_{[neg]}] [_{VP} \ldots$ read newspapers]]]

b. $[_{NEGP}$ not $[_{NEG} \varnothing_{[neg]}] [_{VP} \ldots$read newspapers]]]

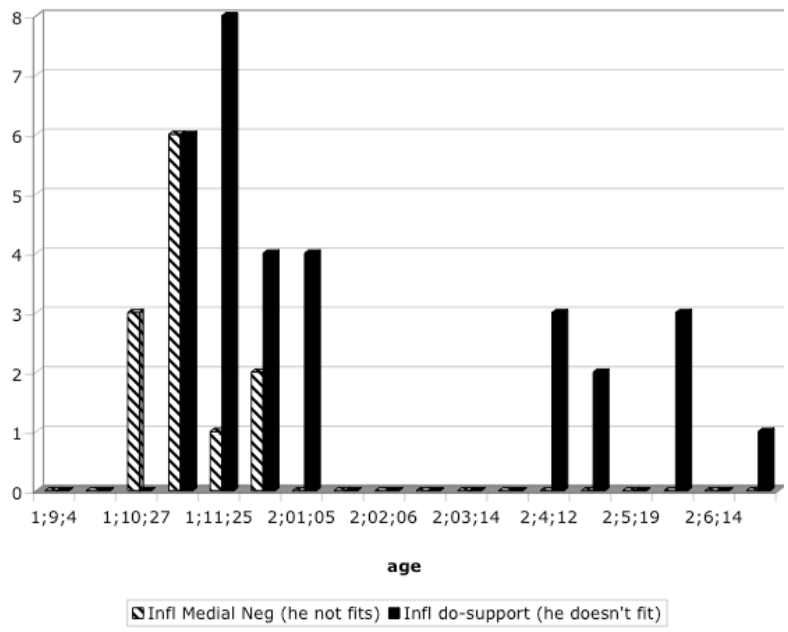
c. $[_{IP} \ldots [_{I} -s_{[aff]}] [_{NEGP}$ not $[_{NEG} \varnothing_{[neg]}] [_{VP} \ldots$ read newspapers]]]

d. $[_{IP} \ldots$ ___ $[_{NEGP}$ not $[_{NEG} \varnothing_{[neg]}] [_{VP} \ldots$ reads newspapers]]]

In our longitudinal study, three children produce inflected medial negation. If the parameter-setting model is correct, we would expect children to produce this type of structure while inflected *do*-support is absent from their speech. In the figures below, I contrast each child's production of inflected medial negation and inflected *do*-support. The data supports our prediction.

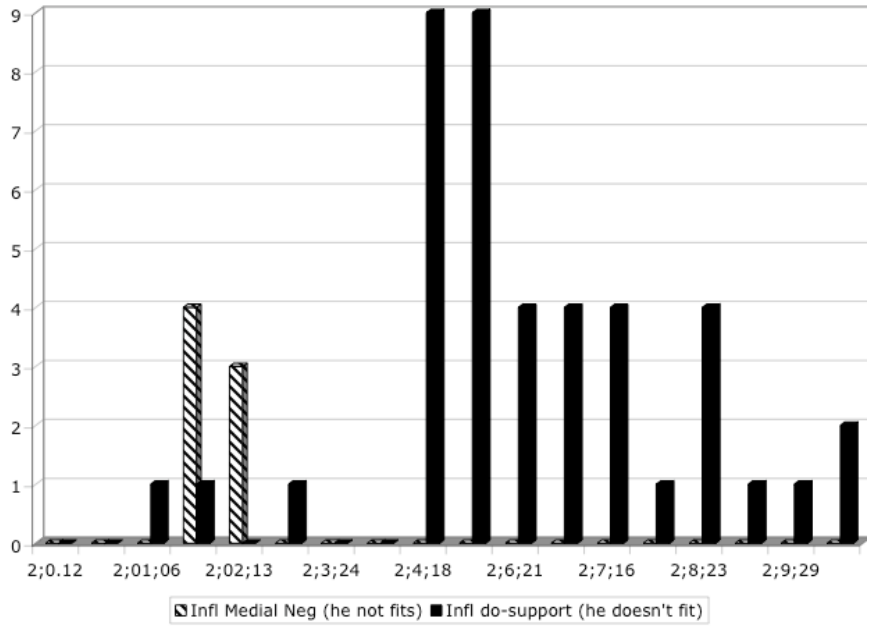
At first glance, CM, seems to be the exception. In Chart 17, it can be seen that this child produced medial negation (shown by the striped bars) at the same time as she produced inflected *do*. A careful analysis of the file from that particular session revealed that, in fact, all her instances of medial negation preceded her production of inflected *do*. That is, for the first half of the session in the lab, CM produced medial negation, and in the second half of the session that day, she used do-support.

Chart 17: CM's development of NEG



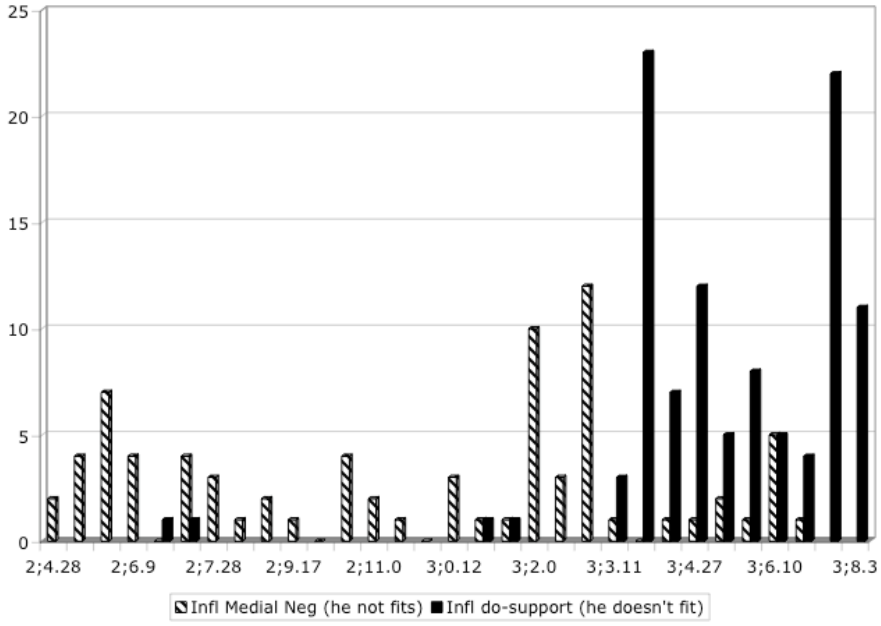
In CW's case, Chart 18, the production of *do* was rare (only 3 examples were found) while medial negation was an option in her grammar. This pattern confirms our prediction: while medial negation was produced (shown by the striped bars), do-support was not required, supporting our hypothesis that *not* was being considered as a specifier.

Chart 18: CW's development of NEG



SF showed the strongest preference for inflected medial negation (shown by the striped bars in Chart 19). For over a year, he produced inflected medial negation, while the use of do-support in negative sentences was almost absent. He produced only four sporadic instances of inflected *do*-support during the period he produced medial negation. Parallel to the emergence of do-support, the use of medial negation started to fade out rapidly.

Chart 19: SF's development of NEG



I draw two conclusions from the distribution of inflected medial negation in child language. First, children may categorize *not* as a negative adverb/specifier which can satisfy the featural requirements of $ø_{neg}$, allowing affixation of INFL onto the verb. Given that the possibility of a negative specifier *not* allows affix hopping to apply, *do*-support is not invoked. Second, there is a strong correlation between the emergence of do-support and the loss of medial negation. I interpret this change as parameter resetting. Some children use *not* as a specifier. In those instances, a featural Neg is selected. However, adult English only selects affixal Neg in matrix sentences. Consequently, when children fix the Neg parameter to affixal, *not* cannot longer be inserted unless they recategorize it as a head. Thus, we should see a surge in the production of affixal negation in those child grammars that reset the featural value for Neg while at the same

time, we should see a decrease in the use of *not* as a negative marker (that is, recategorization of *not* may take longer than resetting the parameter)

This suggests that there should be certain complementary distribution of *not* and do-support in negative sentences. Neither CM nor SF produce *not* in simple present negative sentences after medial negation disappears from their files. Interestingly, I found only two examples where *not* (as opposed to *n't*) is in conjunction with inflected *do* in CW's files, listed in (91) and (92); the two utterances are produced *after* medial negation disappears from CW's speech, which happens when she is 2;2 years old.

(91) He does not like the cookie (CW, 2;5.6)

(92) That does not have feet (CW, 2;7.3)

The complementarity between these two forms is strikingly similar to what happened in English diachronically. At the time English lost verb movement (around the mid-16th century), do-support was not yet a productive option. This situation gave rise to an increasing number of medial negation structures, which then disappeared as do-support become a tense carrier (see chapter 3, §3.3 for details; Warner 1993; Lightfoot 1991; Kroch 1989).

Thus, we have seen that some children may initially categorize the morpheme *not* as a negative adverb, which in accordance with the parametric distinction I drew in chapter 3, can check the featural requirements of a null $ø_{neg}$ head. Adopting this setting allows children to inflect the verb via affix hopping. The data suggests that medial negation could be used as a suppletion strategy to

the use of *do*-support in child language; in other words, it is an alternative way to allow them to express negative thoughts (I return to this point shortly). Next, I will discuss the other non-adult forms that were produced by these children.

6.3 Featural INFL, featural NEG

Given the range of possibilities offered by the combination of morphological values of $\sum_{neg}$ and the morphological values of INFL, (93) is similar to the cases of inflected medial negation, but it varies in the type of inflectional morpheme selected. Whereas in the case of *he not fits*, the merging position of *not* allows affix hopping to inflect the verb, in the current case –where a featural INFL is selected- the merging position of *not* does *not* block the movement of the agreement clitic *–s* to check the feature on INFL as shown in (94) (irrelevant details omitted). The agreement clitic *–s* is generated inside the VP[33] and raises to check featural Infl, positioning the agreement clitic to the left of the negative adverb.

(93) He s not want to sleep (CW, 2;1. 22)

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[33] Possibly as the head of a DP, whose specifier is the overt subject. Thus, the base position for the clitic-like element proposed here would be similar to the structure for clitics and their associated NPs proposed in Uriagereka (1995).

i) …[$_{I}$ Infl$_{F}$ [$_{NEGP}$ not [$_{NEG}$ ø$_{neg}$ [$_{VP}$[$_{DP}$[he] [$_{D}$ s$_{cl}$] want to sleep]]]]

(94) …[$_{I}$ Infl$_{F}$ [$_{NEGP}$ **not** [$_{NEG}$**ø**$_{neg}$ [$_{VP}$ **s**$_{cl}$ want to sleep]]]]

…[$_{I}$ **s**$_{cl}$ [$_{NEGP}$ **not** [$_{NEG}$**ø**$_{neg}$ [$_{VP}$ ~~s~~$_{cl}$ want to sleep]]]]

6.4 Affixal negation

I have showed that three children –CW, CM and SF- initially use *not* as the preferred negative marker. This period is characterized by the almost absence of inflected *do*-support. However, not all children started from the same parametric point. SL, for instance, started with an affixal value for the Neg parameter.

SL did not produce any instances of *not*. The negative marker that she initially used was an uninflected *don't*, as in (95) below. I consider this option to derive from the selection of an affixal negative head. According to the options we are evaluating, affixal $\sum_{neg}$ requires a verbal host. If the child categorizes *n't* as an affixal negative morpheme, then this value requires the affixation of *n't* (or *not*) to a verbal host. If we combine this possibility with a featural INFL, the example in (95) is explained. As shown in the derivation in(96)b, *-s* raises to check the featural value of INFl, while *do* is inserted to provide a verbal host for the reduced form *n't*.

(95) Bear s don't wanna sit train (SL, 2;1.9)

(96) a. …[$_{I}$ I$_{F}$ [$_{NEG}$-n't$_{neg}$ [$_{VP}$ s$_{cl}$ want to sleep]]]]

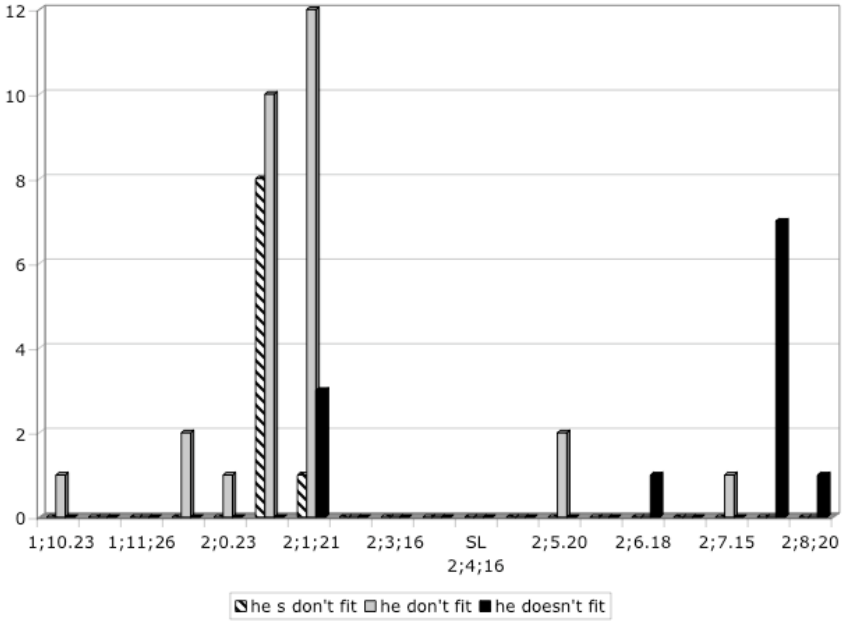
b. …[$_{I}$ s$_{cl}$ [$_{NEG}$ *do*-n't$_{neg}$ [$_{VP}$ ~~s~~$_{cl}$ want to sleep]]]] (do-support for Neg)

Apparently, this child initially hypothesized that *do*-support was not related to Infl, but to the morphological properties of Neg. The absence of inflected do-support from the earliest stage, and the exclusive use of bare *don't* in (finite and non-finite) negative sentences suggests that do-support is not triggered by the presence of Neg. Children who use *do* to support the affixal negation head should not be able to lower the inflectional affix to the verb. The presence of a bare affixal negative marker (*don't*) should block affix hopping.

In SL's data, I found only one example of an inflected verb following the negative marker *don't*, listed in (97), confirming the hypothesis that *don't* is in the head position of NegP. To express sentential negation, SL produced some instances of orphan inflection with *don't* (shown in the striped pattern in Chart 20), which only alternates with a bare form of *do (*shown in grey in Chart 20). I will turn to bare negation with *do*-support shortly.

(97) It don't squeaks (SL, 2;1.21)

Chart 20: SL's negation types



However, in SF's speech, I found several cases of uninflected *do* (i.e. *don't*) followed by an inflected verb, a sequence that it is predicted to be ungrammatical. On my account, *do* is introduced in the derivation to provide support to the affixal negative element, which is in the head position of the phrase. Consequently, affix hopping should be blocked in these cases, the same way as it is blocked in the adult grammar. This does not seem to be the case for SF. Right around the period in which inflected *do* is used productively in his speech, he also starts producing *'don't+ V-s'*, shown in (98) and (99) respectively. He produces 14 utterances of the type *'don't+ V-s'*.

(98) It doesn't swim (SF 3;4)

(99) It don't stands up (SF 3;4)

I suggest the following explanation for the counterexamples in (99). SF is one of the children who produced inflected medial negation consistently. I correlated this option with the miscategorization of the marker *not*, which can satisfy the requirements of the null negative morpheme, $ø_{neg}$ as *not* is inserted in the specifier position. One could take the counterexamples as SF's first attempt to categorize *don't* and *doesn't*. Provided that SF's grammar has a $ø_{neg}$, it is possible that he categorizes *don't* as an adverbial, which can satisfy a featural setting for Neg. At the same time, analyzing *doesn't* should inform the child that Neg is affixal, hence it blocks affixation. That is to say, the incorporation of do-support in SF's grammar triggers a change in the Neg parameter from featural to affixal.

This proposal requires careful consideration of why it takes an extended period of time to categorize *don't*/*doesn't.* This is not only relevant for SF's grammar, but it extends to all the subjects who participated in our study. My claim is that children strictly adhere to UG principles and parameters, as they are 'wired in', and avoid hypothesizing language specific operations, such as do-support (as they are more costly (Chomksy 1991)). One this view, do-support should be one of the last properties of English verbal morphology that emerges in child language.

However, learners cannot ignore the input indefinitely as they need to arrive at a grammar that can parse all the linguistic inputs available. Thus, even if they have set a (intermediate) grammar, the grammar should change as more lexical items are added to the lexicon. At some point children have to incorporate *don't*/*doesn't* in their lexicon, and for that they need to reset their parameters.

Thus, fixing the parameters requires not only a change in the feature specification of the relevant lexical items (cf. Whitman 2000), it requires the postulation of a morphological operation that serves the needs of two different heads: Infl and Neg.

6.5 Conclusions

In this chapter, I have tried to demonstrate how a child may use the parameters specified in UG in ways that are not anticipated by the adult input. Children categorize lexical items in ways that the target does not, leading children to invoke parametric options that are not found in the input, but found in other languages.

I have discussed data that supports the idea that language acquisition proceeds as children categorize the items they encounter, drawing from a finite set of linguistic properties (i.e. morpho-phonological features such featural vs. affixal) encoded in UG. Along with principles that are invariant across languages (e.g. structure dependency, subjacency, etc.), UG also encodes a set of options along which languages may differ. Σ_{neg} can be associated with a featural or affixal parametric value (similar to what has been claimed for English Infl).

We have seen that some children may initially categorize the morpheme *not* as a negative adverb, which can check the featural requirements of a null $ø_{neg}$ head. Adopting this setting allows children to inflect the verb via affix hopping or by feature movement (in the case the child has selected a featural value for Infl). If the child has selected an affixal INFL head, inserting a specifier *not* will

allow the child to satisfy the properties of INFL with no extra operation. Thus, selecting a featural value for Neg and affixal value for Infl would result in a system similar to Swedish.

But not all children started with the same setting. We observed that SL started with an affixal value for Neg. Consequently, we found do-support (viz. the form *don't*) in all her utterances. However, in her grammar, do-support was not yet associated with Infl, as we found instances of orphan morphology. Nevertheless, this option is predicted as one linguistic space given by the intersection of two functional categories, as shown in Table 6.

Table 6: Parametric spaces in child language

	Featural Neg	Affixal Neg
Featural Infl	*He's not like it*	*He s don't like it*
Affixal Infl	*He not likes it*	*He doesn't like it*

I conclude that the data discussed in this thesis support the idea that children mistakes are constrained by UG. Children have access to the principles of UG as well as to a limited set of parametric options, which I have assumed are also specified in UG. Children may access those options freely, until they are able to hone in on all the properties of the surrounding grammar.

7 Extensions and Conclusions

-What's the delay Number One? Why are we not warping out of here?
Captain Jean-Luc Picard, Star Trek

7.1 What do children really have in their heads?

This last chapter is intended to provide a final summary of my discussion and present the topics for my future research. But before turning to the conclusions, I would like to return to the issue of morphological optionality, and suggest a new way of looking at this phenomenon based on our previous discussion.

The main objective of this thesis was to argue in favor of the continuity hypothesis as anticipated in Crain (1991), Crain and Thornton (1998), Hyams (1984): child grammars differ from the adult grammar along the same lines as other natural languages differ from each other. The child data presented in the previous chapters support the continuity hypothesis. Children's apparent mistakes fit squarely within the parametric options that define other natural languages.

7.2 Optional infinitives

I have proposed an account that exploits parameter values that characterize systematic differences between natural languages. However, the system thus envisaged could not predict the omission of the Infl category that is so often attested in English-speaking children. I have claimed that –along with the correct

categorization of the agreement affix *–s*- some children may mis-categorize the morpheme *–s* as a free morpheme with person, number and a [+v] feature; hence those children can generate utterances like *he drinks milk* along with utterances like *he s drink milk*. Similarly for the negative marker *not*, I have claimed that some children may mis-categorize it as a negative adverb that can be projected to a specifier position to satisfy the featural requirements of a $ø_{neg}$ negative head.

However, given that the Continuity hypothesis claims that child grammars can only differ from the target parametrically, a parametric account does not seem to be sufficient to explain the optional infinitive pattern. This is the problem that Wexler's maturational account of the optional infinitive stage has addressed. However, I believe that we can extend the parametric account and understand optional infinitives as a consequence of parameter re-setting, without the need to resort to maturation.

I suggest that the adult English values of affixal Infl and affixal Neg introduce a conflict in a grammar that lacks do-support. The child, who correctly set the parameters to the adult values, is faced with a conundrum. With do-support unavailable, an affixal Infl cannot lower onto the verb over affixal Neg. However, given that failure to lower INFL to the verb is a morphological violation, children may as well try out a morpho-phonological solution.

Invoking a non-syntactic solution is not uncommon. Historically, after English lost verb movement (i.e. verb pied-piping did not longer apply), the grammar moved towards a morphological solution to this paradox by bleaching a causative verb *do* (see Warner 1993 and references within) that developed into the modern *do*-support. Nowadays, adult English makes use of *do*-support in

those contexts where an affixal NEG and/or and affixal INFL fail to find its verbal host (compare this with Swedish, a language that also selects an affixal INFL but whose negative head is featural; in this language, the conflict between NEG and INFL does not arise).

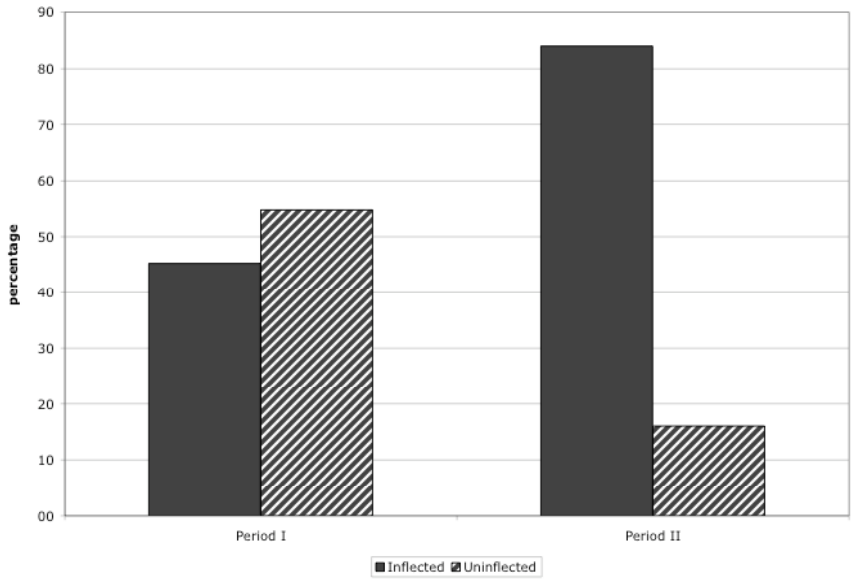
Hence, one solution is to postulate the addition of a do-support operation. But there is another one, deletion of the offending element. That is, an alternative to the *do*-support solution would simply be to *delete* the offending element, or in other words, *not to pronounce* it. Thus, children produce *it not fit* or *he don't fit* —with the inflectional element omitted. This possibility is not unusual in natural languages, as proposed by Lasnik (2001), deletion can be taken as a way to repair a derivation, which may crash otherwise. This hypothesis can be easily tested by looking at the moment do-support emerges as a productive operation in child language and at the moment infinitives decline. If our hypothesis correct, both events should be in complementary distribution, as do-support is presented as the alternative to deletion (it is not possible to test this in affirmative contexts). However, assuming that the same functional items are involved in both sentence types, it is expected that any setting changes that may be triggered by negative sentences spreads out to other contexts where the same categories are involved (an effect that Wilson (2003) does not expect).

On this model, the emergence of inflected *do*-support signals that the children's grammar has re-categorized the morphemes that realize affixal Infl and affixal Neg functional heads. To confirm this hypothesis, I compared the rate of omissions in two different stages cut off by the emergence of do-support. I grouped all children's 3PSg utterances in two categories: *inflected* and *uninflected*,

regardless of the type of inflection they bear (thus, the inflected group contains NP_{3PSG} *V-s* as well as NP_{3PSG} *-s V* sequences, affirmative and negative utterances). Then, I searched for the file that contains the first instances of productive *do*-support (i.e. the file contains more than two instances of inflected *do*-support are found in the same file, and are not repetitions), and considered it as the point in which children have arrived at an adult-like verbal morphology model. At that point in time, I expect omissions to decline.

Our prediction is supported by the data. During the first period, we observe that the production of omissions as shown in Chart 21 by the striped column was almost parallel to the production of inflected verbs. The rate of omission reaches an average of 54% of the total number of 3PSg utterances. In the second period, as predicted, the omission rate declines significantly, reaching only 16% of the time.

Chart 21: Omissions and the emergence of do-support



For a non-parametric model is not obvious why the incorporation of (inflected) do-support to the child grammar should have an effect on the overall production of optional infinitives. For instance, for Harris and Wexler (1993), inflected do-support is given by the purportedly known morphological properties of Infl; therefore, this operation is independent of the child grammar principle that permits infinitives in matrix clauses.

Once do-support is added to the grammar, uncertainty is lifted and omissions (or uncertainty phonological effects) are no longer used to bypass the problem. For the 4 children, the production rate of omissions declines once *do*-support became available, supporting the claim that omissions derived from the morphological conflict that the lack of *do*-support posited for a grammar that moves towards an affixal INFL head and an affixal $\sum_{neg}$ head. Thus, we do not need to assume that part of the knowledge that is required to express the verbal

morphology of the English system needs to *mature*. For instance, Wexler (1998) proposes that the requirement that matrix sentences have a Tense node (for anchoring purposes, cf. Enc (1987)) is not strictly enforced during the OI stage. Such an account cannot explain why the emergence of *do*-support is neatly correlated with the decline in the omission rate. In fact, a maturation account cannot see this correlation as it assumes that children have an adult-like knowledge of the morpho-syntactic properties of the functional nodes and the heads that realize them. On our view, the children's morpho-syntactic knowledge is not adult-like. However, their options fall within the spaces delimited by the parametric values that are associated with the INFL and NEG categories.

7.3 Future research

I am sure that my discussion of these longitudinal data has raised more questions than provided answers. Surely, I am left with more questions. Some of those questions I have intentionally set aside to address in my future research. One of the issues that my proposal does not address is what parameters are involved in other child grammars. Given that our longitudinal studies were limited to English, I could not address this issue in this thesis.

I also set aside these children's production of *questions* and *VP ellipsis* phenomena; topics to which I intend to extend the parameter-setting model in the near future.

7.4 Conclusions

Children drop things, indeed; but when we refer to children's grammatical systems, children know when to drop things. That is because the human language capacity is a specialized biological component whose principles and parameters are innate, serving as a blueprint for natural languages, including the intermediate stages through which children go through.

We may think of the system as a complex network, associated with a switch box that contains a finite number of switches. The network is invariant, but each switch can be in one of two positions, on or off. Unless the switches are set, nothing happens. But when the switches are set in one of the permissible ways, the system functions, yielding the entire infinite array of interpretation for linguistic expressions. A slight change in switch settings can yield complex and varied phenomenal consequences as its effects filter through the network (Chomsky 1999: 49)

I contrasted this view with a functionalist view of language: a language is a continuum of symbolic constructs, which range from the smallest morphemes, simple and complex phrases, idioms, to complex sentences (Goldberg 1995, Tomasello 2003)

Constructions are taken to be the basic unit of language. Phrasal patterns are considered constructions if something about their form or meaning is not strictly predictable from the properties of their component parts or from other constructions (…) In addition, expanding the pretheoretical notion of construction somewhat, morphemes are clear instances of constructions in that they are pairings of meaning and form that are not predictable from anything else (…) It is a consequence of this definition that the lexicon is not neatly

differentiated from the rest of the grammar. (Goldberg 1995: 4)

These two views make opposing predictions with respect to the development of language knowledge in the child brain: an innatist view expects a certain continuity between the initial state and the final state of the mental faculty. On the other hand, the functionalist view expects a gradual development of linguistic knowledge beginning with rudimentary item-based utterances until reaching the sophistication of the adult behavior. Equipped with a powerful associative learning capacity, children gradually learn the language constructs from positive input. The role of experience, in this approach, is to provide a social communicative context that helps the child learn the construct and categorize it, *and* to strengthen the associations between stimulus and response as a function of frequency and proximity in time and space. Overgeneralizations based on brute analogies are kept in check by specialized mechanisms, such as *preemption* and *entrenchement*. With the constant influences of entrenchment and preemption processes, children's representations grow in strength and abstractness, until reaching the level of abstraction that allows them to learn, assimilate and adapt to new, novel structures with little need to need for exposure.

The evidence from our longitudinal study shows that English-speaking children's language development supports the first account. We have seen that a parametric model correctly explains why children's linguistic hypotheses are not necessarily tied to the input as predicted by the functionalist approach. On that approach, the learner is to hypothesize only constructions that she has heard

previously; that is, the learner never projects beyond the input. However, we have seen non-adult forms that do not have a correlate in the adult input.

I considered the possibility that the morpheme is a pared-down copy of an adult model, but dismissed this proposal on the following grounds: there is no communicative situation which can lead the child to create the pattern [Subject$_{3Sg}$ + -s- + V] from affirmative, negative or interrogative contexts. As discussed in Theakston et al. (2003), affirmative and interrogative utterances can serve as models for the item-based (mis-) generalizations that make children produce inflected and uninflected affirmative sentences respectively. If children know the meaning and pragmatics of 3PSg contexts, then an utterance such as *Pooh s like the cake* does not have a source in the adult models.

In addition, the constructivist approach predicts that children overgeneralizations are not productive until age 3 or later; but all the variations we have discussed are attested before that age. Therefore, I concluded that the early production of non-adult forms does not support the main predictions made by the functionalist approach.

I later showed that children's utterances are non-adult on occasion. That is patent in the realization of the agreement morpheme *–s*, which does not have the distribution it would in adult sentences (cf. *he s like the cake/he s not like the cake/ he not likes the cake)*. Instead of transferring the agreement information to auxiliary verb *does*, these children explore the possibility of using an orphan inflectional morpheme, or mapping the negative marker to a specifier position, thus resulting in the initial absence of inflected *does* in their negative sentences.

Following Lasnik (1995) and crosslinguistic observations with respect to the behavior of agreement elements in Romance languages (Uriagereka 1995), I proposed that the orphan agreement morpheme can be interpreted as a clitic-like element: it bears nominal characteristics (ϕ-features) and verbal characteristics [+v] as well. I then argued that children may alternate between two head types which realize the functional category INFL in 3PSg contexts either as a featural head or as an affixal. . Eventually, children who adopt this value reanalyze the clitic-like *–s* as an affix, i.e. the element loses its verbal feature and becomes a verbal affix. This explanation, although highly speculative, is consistent with diachronic changes elsewhere. Consider for instance the categorial shift in Mandarin Chinese as discussed in Whitman (2000). Whitman interprets syntactic change (or syntactic reanalysis) as a change in the categorial feature composition of a head. In particular, he discusses the categorial change from a determiner *d* to a verbal *v* composition for the item *shi*. Initially, *shi* was a subject pronoun and turned into a copula verb. A similar consideration was discussed for the negative markers in English.

I proposed that two different morphemes realize Σ_{neg}, one bears an affixal value (*not*/*n't*), triggering affixation to *do* in the morphology, and the second morpheme, the zero morpheme, has a featural value, which is satisfied by merging an adverbial (e.g. *never*) if movement is not available. I considered the possibility that children may categorize *not* as a negative adverb/specifier which can satisfy the featural requirements of $ø_{neg}$, allowing affixation of INFL onto the verb. This correlation is similar to the diachronic development of English

negative markers. The negative marker *not* changed from being a specifier in Old English to being a head in Modern English (see Roberts 1993). Once again, we can claim that a child may assume a different set of features for the lexical items in question that results in (parametric) variation.

Finally, I suggested a possible alternative to the maturation account for the Optional Infinitive stage. Contrary to Wexler's *early knowledge of inflection*, I showed that children failure to realize the agreement affix/clitic is a morphological violation derives from uncertainty introduced by a parametric conflict. Children who lack *do*-support are bound to find a conflict in the satisfaction of the morphological requirements of the adult affixal values. Thus, as a solution to the paradox, children resort to the deletion of the offending item (i.e. omission of the affix that does not lowered to the verb, or omission of the clitic that is not pied-piped to a featural INFL). Once parameter re-setting, which is equated with the recategorization of relevant morphemes, converges with the adult grammar, uncertainty is lifted and uncertainty phonological effects that results in omissions are no longer used to bypass the problem. This implies that the system has finally incorporated the morphological operation of *do*-support. The data confirms this prediction. Once *do*-support is incorporated as a productive operation, omissions sharply decreased in all four children.

In this way, the argument that INFL should emerge as "unitary underlying category" (Wilson, 2003) is no longer a problem. The source of variation is not the INFL category itself, but the set of properties characterizing the different inflectional elements that realizes that category. Consequently, it should not be expected that INFL behave as a unitary category in child language,

as the categorization of the inflectional morphemes may vary given that the options are readily available to the child, but not entirely pre-set.

I hope to have demonstrated the relevance of the continuity approach by showing the seamless interaction between UG general principles and language specifics in promoting knowledge of language. Children show mastery in the absence of experience. Moreover, children show that mastery can go beyond what it is directly experienced but only as far as UG principles and parameters allows them to go.

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