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It was sorrowful that Keisuke Tsumura, a good friend of mine, passed away while I was in LA. With emotion, regret, and my profound admiration of him, I would like to dedicate this dissertation to him.

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ABSTRACT OF THE DISSERTATION

Roots in Language Acquisition:
A Comparative Study of Japanese and European Languages

by

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In this dissertation, we discuss two phenomena of root (= matrix) clauses in which child languages differ from adult languages: External Negation and Root Infinitives, and seek the root (= source) of the child-adult difference. By examining the properties of the root (= store), we argue that these differences are caused by Morphological Maturation and that the clausal structure and principles imposed on them are continuously the same throughout development.

First, children acquiring Japanese optionally attach the negative auxiliary neg to the finite (auxiliary) forms (i.e., External Negation), while negated verbs must be obligatorily inflected for the non-finite Irrealis form in adult Japanese. We examine the data of three children, and point out that when External Negation is found at around 60% with concausal verbs, it is at zero around 5% with verbal verbs (p << .001) by the Chi-square test. Therefore, we argue that External Negation is caused by immaturity in verbal formation of concausal verbs, which is more complex than that of verbal verbs, and that External Negation does not deviate from adult negation concerning the clausal structure, finiteness of neg (i.e., Japanese NSG), and the non-finiteness of negated verbs.

Second, non-finite verbs optionally appear as main verbs in root clauses in many child languages (e.g., Root Infinitives, cf. Wecker (1994)). After observing that this phenomenon occurs in the acquisition of non-pro-drop languages (e.g., French, Dutch, German, Swedish), but not of pro-drop languages (e.g., Italian, Spanish, Japanese), we argue that the Root Infinitive phenomenon is caused by the immaturity of a certain inflectional affixation process characteristic of non-pro-drop languages. We propose that inflectional affixes in non-pro-drop languages are adjoined to V, which raises to l together with V for feature-checking as in Chemnitz (1993), while in pro-drop languages they are heads of l, to which V adjoins as in Chemnitz (1991). Under this proposal, Root Infinitives are caused by the immaturity of adjunction-affixation, which allows l to be underspecified and compatible with both infinitival and finite verbs.

Though we deny that External Negation and Root Infinitives arise from exactly the same source, we suggest that they do share a certain general syntactic property: in a sequence of verbal elements in a selectional relationship, the highest verbal element must always bear finite tense.

mining in child English, it was argued that child English lacks functional projections, in Gottlieb and Noonan (1988), Lehnert (1988), and Radford (1990) (cf. Chomsky et al. (1994, p.399) for a summary of parallel proposals for child German). This analysis essentially claims that functional projections are not available until some maturation occurs at some point in development. However, this claim has been called into question given the observation that children correctly place verbs in overly different syntactic positions depending on the finiteness of the verb, consistent with the target adult language. This is clearly illustrated in the case of the acquisition of grammatical genders in even verb movement, such as French, Dutch, German, etc. (cf. Weissenbichl (1988), Pienemann (1992), Poeppe and Winter (1993), etc.; detailed review will be given in Chapter 2).

Thus, since finite verbs appear in a position different from non-finite verbs in some child languages, as in the target adult languages, child languages should have positions for both finite and non-finite verbs. That is, there must be both a functional projection (I or C) for finite verbs) and a lexical projection (V; for non-finite verbs). According to this analysis, functional projections are argued to be continuously available. These, then, are the two contrasting analyses of the continuity/incremental clausal structure in UG.

1.2.3. Remaining Issues and the Contributions of This Study

The observation of distinctive verb-placement mentioned above is striking and it does not seem possible anytime to maintain the position that functional categories are completely missing in child languages before maturation. However, there remains a question: if the clausal structure in child languages is completely the same as the adult's, why are various functional elements found to be missing in child languages? By answering this question while assuming the continuity of functional projection(s), our understanding of child languages and the linguistic theory behind them will be enhanced.

To address this issue, it is useful to rethink the phenomenon of child languages in terms of the formulas in (2) and (3), repeated below.

(2) UG(s) + Lexicon(s) of Language X = Child Language X

(3) UG(s) + Lexicon(s) of Language X = Adult Language X

(6 child, e adult)

(where X = English, Japanese, etc.)

Given that verb-placement contrasts on finiteness is similar for child languages and adult languages, and given the relationship between verb position and functional projections, we must adopt the position that UG(s) is the same as UG(s) with respect to functional projections. Following this assumption, the existence of functional morphemes in (some) child languages should be traced to the differences between Lexicon(s) and Lexicon(s). Usually, lexical differences do not receive theoretical accounts. However, when the delay in lexical acquisition is found to be restricted to some particular morphological class, we may be able to claim that there is some maturation in the morphological component of the innate linguistic capacity and this causes a delay in the acquisition of some functional items in the lexicon. Such a claim of morphological maturation is compatible with the continuity of clausal structure in UG and yet explains children's omission of functional elements.
Chapter 1
Introduction

In this dissertation, we will provide theoretical analyses of two phenomena in language acquisition: External Negation in child Japanese and Root Infinitives, which are found in the early stages of the acquisition of non-pro-drop languages (e.g., French, Dutch, German, Swedish, English, etc.). As usual in theoretical studies of generative grammar, the basic research goal is to tease apart innate linguistic properties (UG, cf. Chomsky (1981)) and other properties (i.e., lexical items, "parameters") which are learned through experience, in our analysis of linguistic phenomena. However, studies in language acquisition require additional consideration due to the nature of the data in child languages. In this chapter, we will introduce our general ideas of how studies of language acquisition can contribute to linguistic theory and outline the contributions we will make.

1.1. Studies of Language Acquisition in Generative Grammar

Let us first begin by discussing our conception of linguistic theory, and then compare it with the conception of language acquisition theory to be developed. The goal which we pursue in construing linguistic theory is to elucidate the innate linguistic capacity of human beings. This type of linguistic theory is what is known as "generative grammar" (cf. Chomsky (1965), Chomsky (1986a), etc.). Under this view, linguistic theory seeks to characterize the general nature of the language faculty in the human brain by investigating the nature of the brain's internal knowledge of a particular natural language, such as English or Japanese. Knowledge of a particular language consists of a combination of innate and universal linguistic capacities (i.e., Universal Grammar, henceforth UG) and language-particular properties, which are learned based on the input data in the environment. These non-innate properties include some properties of lexical items and parameter values of UG which are acquired at some point in development (cf. Chomsky (1981) and Hayes (1986a) for the concept of parameters). If parameters are misinterpreted as variations of functional elements in the lexicon (cf. Borer (1983)), everything learned may be misconstrued as being in the lexicon. Hence, the knowledge of language in the human brain can be schematized as in (1).

(1) \[ \text{UG} + \text{Lexicon of language } X = \text{language } X \]

(\[X = \text{English, Japanese, etc.}\])

One of the major tasks that the theory of UG must accomplish is to account for what is possible and impossible in human languages. Native speakers of some languages have this knowledge of what is possible and impossible in the language. The knowledge that some structure or process is impossible cannot be learned on the basis of a list of well-formed sentences, but the input sentences which children receive from the adult speakers in their environment should be assumed to consist essentially of the pair of well-formed sentences and their meanings (cf. Weiskopf and Cohn (1980)), given the observation that children do not accept grammatical corrections (cf. Brown and Hanlon (1979), Morgan and Travis (1989) for some examples and discussions). Hence, principles that explain the knowledge of the "impossibilities" are argued to belong to UG, as opposed to the non-innate properties of the "Lexicon of language X" in (1), which are learned.

We intend to develop generative linguistic theory, the theory of UG, by studying language acquisition, in quite the same way. However, in addition to what is possible and impossible in child languages, we need to explain the difference between child languages and adult languages. Taking this into account, the model of knowledge of language in (1) should be separated into the two parts in (2) and (3) for acquisition research.

(2) \[ \text{UG(\#) + Lexicon(\#) of Language X = Child Language X} \]

(3) \[ \text{UG(\#) + Lexicon(\#) of Language X = Adult Language X} \]

(\[X = \text{English, Japanese, etc.}\])

By examining child-adult differences, namely children's "errors", we attempt to identify where the differences come from. One possibility, which we will discuss more in the next section, is that UG matters, that is, it becomes active by biological maturation at some point in development and is inoperative before then, as advocated in Borer and Weiskopf (1983, 1991), Felix (1986), etc. Under this hypothesis, UG at the child stage (UG\#) in (2) is intransitive and different from UG at the adult stage (UG(\#)) in (3). This would be one source of child-adult differences. The other possibility is that the lexicon, the non-innate learned properties, are not the same for the child and the adult (i.e., Lexicon(\#) \# Lexicon(\#) is (2) and (3)). This may serve as the source of children's grammatical errors.

In this way, studies of language acquisition may be viewed as an attempt to discover whether a child-adult grammatical difference stems from a difference in UG or in the lexicon and hence reveal the properties of UG and the lexicon in child languages.

1.2. Contributions of Studies of Language Acquisition

Next, we would like to discuss general ideas regarding the contributions of language acquisition studies to generative linguistic theory. For this purpose, we will review some previous acquisition studies. Then, we will introduce the contributions we want to make in this dissertation.

\[\text{This is an argument based on the so-called "poverty of stimuli" (cf. Chomsky (1965, 1986)).}\]
1.2.1. Previous Studies

After generative syntax developed into the theory of conditions or principles imposed on syntactic operations (cf. Chomsky 1972, 1981), there emerged studies of acquisition which attempted to inquire into the innate principles in children's grammar. In the late '70s and early '80's, experimental studies were done to determine whether those syntactic principles constrain child languages or not. Interesting results were obtained for cases in which children make some errors and yet obey innate syntactic principles, such as Subjacency or Binding Conditions (cf. Ohar 1981) and papers in Goodluck and Soder (1978) and Tavakolian (1981).

After the syntactic conditions were organized into principles and cross-linguistic variation was proposed to result from different settings of parameters of those principles, in Chomsky (1981), child languages became an empirical domain for evaluating theories of parameters. A child adult difference may be conceived as a difference in parameter settings, and if a set of child-adult differences may follow different settings of one particular parameter proposed for cross-linguistic variation in adult syntax, it gives strong support for the parameter theory. Some studies in the mid-to-late '80's attempted to achieve results in this direction: the Null Subject Parameter in Hyams (1986), Jargill and Hyams (1988), and the parameter of Governing Categories in Wexler and Manzini (1987); also see other work in Rooper and Williams (1987).

The earlier work which describes children's grammar by phrase structure rules and transformational rules, such as Mynot (1969), Bloom (1970), Chomsky (1972), McNeil (1978), etc.

Since Boomer and Wexler (1987), which explored the possibility of explaining developmental delays by maturation of UG, is particular, maturation of A-chains, various developmental facts have been discussed in terms of continuity and maturation of UG. When a child language displays a phenomenon which is impossible in the target adult language, there are two questions of what the origin of this difference is. As we discussed with the schemes in (2) and (3), one option is to attribute it to immaturity of UG and the other is to attribute it to a delay in lexical acquisition. Conceptually, the continuity hypothesis (cf. Klein 1982, Parker 1984, Hyams 1986), which claims that UG constrains child languages continuously throughout development, is more restrictive than a position which admits maturation of UG, because the latter, unlike the former, admits the possibility that the human brain forms rules unconditioned by UG (before maturation). However, this question should be settled for each topic on empirical grounds. Not surprisingly, the maturation of syntactic principles is seldom proposed, for it would predict serious empirical overgeneralization of ungrammatical sentences excluded by UG principles, as well as being conceptually less restrictive. See Rizzio (1994) for discussions comparing various positions regarding continuity vs. maturation and a particular maturation proposal.

Interesting points have been made on the issue of continuity/maturity of clausal structures. Since Chomsky (1986b), the clausal structure is divided into functional projections such as CP (i.e., complementiser phrase) or IP (i.e., inflectional phrase) and the lexical projection VP. Based on the observation that functional elements such as agreement affixes or tense affixes, which are associated with functional projections, are

existing in child English, it was argued that child English lacks functional projections, in Gallihoyle and Noonan (1988), Lebeaux (1988), and Radford (1990) (cf. Chibak et al. 1994, p.399) for a summary of parallel proposals for child German). This analysis essentially claims that functional projections are not available until some maturation occurs at some point in development. However, this claim has been called into question given the observation that children correctly place verbs in very different syntactic positions depending on the finiteness of the verb, consistent with the target adult language. This is clearly illustrated in the case of the acquisition of languages with overt verb movement, such as French, Dutch, German, etc. (cf. Weissbroom 1988, Pierce 1992, Preppel and Weisler 1993, etc.; detailed review will be given in Chapter 2).

Thus, since finite verbs appear in a position different from non-finite verbs in some child languages, as in the target adult languages, children should have positions for both finite and non-finite verbs. That is, there must be both a functional projection (I or C) for finite verbs and a lexical projection (V; for finite verbs) and a lexical projection (V; for finite verbs). According to this analysis, functional projections are argued to be continuously available. These, then, are the two contrasting analysis of the continuity/maturity of clausal structure in UG.

1.2.2. Remaining Issues and the Contributions of This Study

The observation of distinctive verb placement mentioned above is striking and it does not seem possible anymore to maintain the position that functional categories are completely missing in child languages before maturation. However, there remains a question if the clausal structure in child language is completely the same as the adult's: why are various functional elements found to be missing in child language? By answering this question while assuming the continuity of functional projection(s), our understanding of child languages and the linguistic theory behind them will be enhanced.

To address this issue, it is useful to rethink the phenomena of child languages in terms of the formulas in (2) and (3), repeated below.

(2) \[ UG(\text{X}) + \text{Lexicon}(\text{Language X}) \]
(3) \[ UG(\text{X}) + \text{Lexicon}(\text{Language X}) = \text{Adult Language X} \]

(\text{X: child, \text{X}: adult})

Given that verb placement contingent on finiteness is similar for child languages and adult languages, and given the relationship between verb position and functional projections, we must adopt the position that UG(\text{X}) is the same as UG\text{X} with respect to functional projections. Following this assumption, the omission of functional morphemes in (some) child languages should be traced to the difference between Lexicon(\text{X}) and Lexicon(\text{X}). Usually, lexical differences do not receive theoretical accounts. However, when the delay in lexical acquisition is found to be restricted to some particular morphological class, we may be able to claim that there is some maturation in the morphological component of the innate linguistic capacity and this causes a delay in the acquisition of some functional items in the lexicon. Such a claim of morphological maturation is compatible with the continuity of clausal structure in UG and yet explains children's omission of functional elements.
In this dissertation, we will explore a preliminary theory of morphological maturation in language acquisition. The case of functional element omission in child English is merely an illustration of what may be viewed as morphological maturation and it was discussed to show its relation to the history of acquisition studies. Our specific analysis will deal with External Negation in child Japanese and root infinitives in a cross-linguistic comparison of Japanese and European languages.

We expect that introducing the possibility of morphological maturation will make a certain contribution to generative linguistic theory. As in previous studies, the central question concerns the status of innate properties in language development: whether some innate linguistic capacity, which may be a syntactic principle or morphological operation or others, is "continuous" (i.e., continuously available in the process of development) or "nativational" (i.e., matures at some point of development). However, given the possibility that morphological maturation is involved, it is possible that analyses of child languages will end up providing evidence of the continuity of previously undiscovered principles or parameters. If, in introducing some phenomena in child languages, the child-adult difference truly turns out to be due to some particular aspect of morphological maturation, the rest of the phenomena under investigation should reflect the continuous aspects of UG. We will argue for such cases in this dissertation. Since the continuous aspects of grammar held in adult languages as well, studies of language acquisition may contribute to the progress of linguistic theories, by considering morphological maturation, as well as examining the status of independently established linguistic principles in language development.

1.3. Theoretical Framework

As discussed in the previous section, our study of language acquisition will focus on determining which aspects of child language phenomena mature and which are continuous throughout development. Given that we will explore the possibility that morphological properties may be subject to maturation, our inquiry does not have to be and will not consist of the direct application of some existing theory of syntax. As a matter of fact, our study will not abide by a unique theoretical framework in the narrow sense.

Here we will introduce the broad framework within which our study is embedded. In particular, we will be explicit about our assumptions with regard to clause structure and affixation, which will be the main theoretical domain of our study.

Our study will be consistent with the syntactic theory outlined in the Minimalist Program (cf. Chomsky (1993)) in the sense that we accept the existence of only two levels of representation: PF (phonetic form) and LF (logical form). As for X-bar theory which regulates phrase structure building, we will follow Chomsky's (1995) Bar Phrase Structure theory which builds phrase structure by directly combining words (or elements) and their projections without projecting unnecessary intermediate projections, which were obligatory in the X-bar schema. We may post X nodes above words for expository reasons, though. A syntactic structure undergoes successive syntactic operations (i.e., transformations), which ultimately produce an LF representation, and one syntactic structure in Spell-Out, that is, it feeds into PF at some point of the derivation. Thus,

the effects of transformations that take place before Spell-Out are visible at PF but the ones after that are not (cf. Chomsky (1993)).

Most of these assumptions are still too broad for our purposes. Below, we will provide a more concrete introduction to our theoretical assumptions by focusing on clause structure and affixation, which, for us, will be the relevant domains of general linguistic theory.

We adopt Chomsky's (1993b) proposal that there are functional projections headed by IP (e.g., English, French, Japanese) or CP (e.g. Dutch, German, Swedish), depending on the language. Following the spirit of Pollock (1989), Chomsky (1993), and Chomsky (1995), we posit that verbs move to I (and to C, depending on the language) to receive their inflectional properties. The I node may be separated into T and AGR or even further, as in the studies cited just above, but we adopt the simpler system since our discussions will not include cases where this separation is structurally crucial.

Under this view, the clause structure of IP is derived in the following way.

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4 Languages which exhibit the Verb-2nd phenomenon in root clauses but not in subordinate clauses are argued to have root clauses headed by CP. See Chapter 2 for a concrete discussion.
checking the features of the affix against those in 1, as in Chomsky (1993). We will argue that the dual system is motivated by the typological variation. For the moment, we simply note that the dual system is not internally contradictory as long as the head and the adjunct are distributed in a principled way. Moreover, we do not call for lowering movement for English affiliation, which was the major disadvantage of affiliation in Chomsky (1991). English inflectional affixes adjoint to V and undergo checking, as in Chomsky (1990), under our analysis. For details of the affixation, see Chapter 4.

1.4. Outline of the Dissertation

Here is a brief outline of each of the chapters that follow. In Chapter 2, we will discuss two observations regarding finiteness in child languages: (i) the distinction between finite and non-finite verbs and (ii) non-finite main verbs in root clauses in child languages. We will compare Japanese and European languages with respect to these two points. The discussion reveals that Japanese and European languages are the same in that finiteness is distinguished from the early stages of acquisition, although in different ways.

In Chapter 3, we will discuss negation errors in child Japanese, which we will call External Negation. We will argue that this error is caused by the immaturity of morphology (infinite formation of consonantal verbs), and point out that our analysis preserves a generalization that holds of European child languages, CAP (Continuous AUX-Placement), with respect to negations in child Japanese.

Chapter 2
The Morphosyntax of Finiteness in Child Languages: Background

In this chapter, we will compare Japanese and European child languages with respect to the morphosyntax of finiteness. In European child languages, two interesting observations have been made: (i) children correctly distinguish finite and non-finite verbs in their overt placement, and (ii) children wrongly produce non-finite main verbs in root clauses. We will see that child Japanese is quite different: (i) children produce both the finite form and the non-finite form in root clauses, while the Japanese is the required form, and (ii) children produce finite verbs only as main verbs of root clauses, as is correct in the adult language.

Despite the fact that they show different characteristics in this way, we intend to identify the common properties of Japanese and European languages. Specifically, we will attempt to apply the abstract syntactic generalizations of finiteness in European child languages, discussed in Waxler (1994), to child Japanese. We will show how some of these generalizations hold for Japanese when viewed from a particular perspective.

2.1. European Child Languages

First, we discuss the European child languages, that is, French, the V2 languages such as German and Dutch, and English. When we compare the distribution of finite and non-finite verbs in these child languages with those of the corresponding adult languages, we find an interesting difference and a similarity. The difference concerns the possibility of non-finite verbs occurring in root clauses as main verbs (i.e., without finite auxiliary verb). The similarity concerns the placement of finite and non-finite verbs in functional heads (I or C) and lexical heads (V), respectively.

So-called 'pro-drop' Romance languages, such as Italian and Spanish, are not included because they do not display non-finite main verbs in root clauses. We will discuss this variation in Chapter 4.

2.1.1. Root Infinitives in Non-Pro-Drop European Languages

Below we will discuss the two cases in child languages in which we find non-finite verbs occurring in root clauses, unlike in adult languages. In our discussion of root infinitives, we will review the representative instances of European child language root infinitives in Waxler (1994), and display their frequencies in such language.

In adult languages, infinitives can only appear in embedded clauses. The infinitival case must be anchored by the finite tense of the matrix clause for its interpretation (cf. Egy (1997), for example). Also, the subject of the infinitival clause, PRO, must be controlled by the matrix subject, to receive a non-subjunctive interpretation. However, it has been observed that infinitives may optionally occur as the main verbs of root clauses in some child languages. We refer to this phenomenon as optional root infinitives (RI u) (cf. Rizzi (1994), Waxler (1994)). Waxler (1994) shows that optional root infinitives are found in many European child languages.

In Chapter 4, we will discuss the typology of the phenomena of "root infinitives", that is, why non-finite verbs may be main verbs in root clauses in some child languages (i.e., non-pro-drop European languages) but not in others (i.e., pro-drop European languages and Japanese). We will argue that the root infinitive is caused by the immaturity of morphology (adjunction-affixation), and point out that our analysis implies that there is a generalization in head-affiliation, CHAP (Continuous Head-Affix-Placement), which is structurally very close to CAP in Chapter 3.

Thus, in Chapter 3 and Chapter 4, we will claim that the difference between child languages and adult languages with respect to External Negation and Root infinitives stems from the maturation of morphology. We will argue that there are principles continuously at work in the child language phenomena: CAP and CHAP. At the end of Chapter 4, we will discuss the possibility of unifying CAP and CHAP.
In child French, for instance, both the finite form and the infinitive form are found in root clauses, as pointed out in Pierce (1992) with examples such as those in (1).

(1) a. voir 'see'
   (2) a.
   (Nativité 2:2)
   Child, Age

   s'.
   elle va voir Yves.
   (Nativité 2:2)
   (do she go see Yves?

   b. dormir petit bébé.
   (Daniel 1:11)
   (sleep InfSF little baby)

   b'. dort bébé.
   (sleep InfSF baby)
   (Daniel 1:11)
   (from Pierce 1992)

   (NFW: intransitive, FIN: finite)

It is noted that such clauses with root infinitives tend overwhelmingly to refer to ongoing activities (Wexler 1994, p. 310-311, referring to Pierce 1989 and Lightbown 1997)). As a result, Wexler and Pierce suggest that the meaning inferred from these contexts is not that of an ungrammatical model. This point may be controversial, however, since other work such as Bates et al. (1992), Kehler (1994), and Hagerman (1996) point out that many root infinitives do have a model interpretation. The model/non-model difference may be due to the type of languages, French and Germanic V1 languages (see Pfeppel and Wexler 1995) and Whitman (1994) for theoretical arguments for each position. Perhaps it is impossible to claim that root infinitives always involve ungrammatical models or never involve them. Here we simply focus on the fact that root infinitives exist in these child languages though they are not allowed in adult languages. Thus, this fact requires explanation, no matter if the root infinitives involve model omission sometimes or never.

We should note that, in French, infinitive forms are homophonous with participles for the most common class of verbs ending -er (e.g., parler 'to talk' and parlé (participle), both pronounced as [par]). In order to establish that the relevant examples are infinitives, Wexler points out that there are examples with verbs of different classes, including those in (1), which are unambiguously infinitive (cf. Wexler 1994, p. 311).

Wexler (1994) demonstrates that root infinitives are found in various types of child languages, including the Germanic V2 and V3 languages (Dutch, German) and Mainland Scandinavian languages (Danish, Norwegian, Swedish). Examples from Dutch and German are listed below.

(2) a. Dutch
   Pappa schoon wonen. 'Daddy does housework'
   R: ook kan
   I also can
   (from Weverink 1989)

   b. German
   Zahnstr pasta.
   'Tooth brush'
   Theresus das habe.
   'Theresa has'
   (from Wexler 1994)

In addition, he argues that the bare forms of lexical verbs in child English, namely those without the agreement affix -s is obligatory contexts as in examples in (3), are also root infinitives. Here are some examples.

(3) a. Eve at floor. (Des 1:7)
   Where pretty girl (Adam 2:6)
   That she fall down. (Nina 2:6)

   (taken from the corpora available through CHILDDES, cf. MacWhinney and Snow (1985) or CHILDDES, Brown (1973) on the corpora of Eve and Adam; Suppes et al. (1973) on the corpora of Nina)

Children's use of infinitives in root clauses is optional in the languages discussed in Wexler (1994), yet quite robust. The frequency of root infinitives in what we refer to in RI languages are shown in the table below, a revised version of a table in Saso and Hyams (1994).

<table>
<thead>
<tr>
<th>Language</th>
<th>Child Name</th>
<th>Age</th>
<th>% of RIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>French</td>
<td>Natalie</td>
<td>1:6-2:11</td>
<td>.76</td>
</tr>
<tr>
<td>German</td>
<td>S</td>
<td>1:10</td>
<td>.61</td>
</tr>
<tr>
<td>German</td>
<td>(Vestmomen 1989)</td>
<td>1:11</td>
<td>.73</td>
</tr>
<tr>
<td>German</td>
<td>(from Guasti 1994)</td>
<td>2:1</td>
<td>.53</td>
</tr>
<tr>
<td>German</td>
<td>(from Guasti 1994)</td>
<td>2:2</td>
<td>.40</td>
</tr>
<tr>
<td>Dutch</td>
<td>Laura</td>
<td>1:6-2:1</td>
<td>.66</td>
</tr>
<tr>
<td>Dutch</td>
<td>Tobias</td>
<td>1:10-1:11</td>
<td>.56</td>
</tr>
<tr>
<td>Dutch</td>
<td>Freda</td>
<td>1:6-2:1</td>
<td>.56</td>
</tr>
<tr>
<td>Swedish</td>
<td>Perja</td>
<td>1:11-2:10</td>
<td>.69</td>
</tr>
<tr>
<td>Swedish</td>
<td>Eriska</td>
<td>1:5-2:10</td>
<td>.64</td>
</tr>
<tr>
<td>Swedish</td>
<td>Enisa</td>
<td>1:5-2:10</td>
<td>.78</td>
</tr>
<tr>
<td>Swedish</td>
<td>Eve</td>
<td>1:5-2:10</td>
<td>.78</td>
</tr>
</tbody>
</table>

As we will see later, there are other languages which do not exhibit the RI phenomenon. However, given the generality of the overall quantitative data in Table 2.1, we can safely affirm that the root infinitive phenomenon is substantial in certain child languages.

Root participles, found in English or Italian, for example, may be part of the same phenomenon (cf. Saso and Hyams 1994). Some examples are given below.

(4) Adam bathe (ADAM 2:4)
   1 brushing. (OSS 1:9)
   Boba making a table. (NDN 2.3)
   (Data from CHILDDES, cited.)

(5) Vito wash
   'See kitty'
   Cotta a soppa.'Cooked the food'
   'Broke the ball'
   Rotta a pullina.'Stom the ball'
   'Stom this'
   'Door closed'
   Aviva clausa. (from Antelme 1992)

For these cases, we do not go beyond pointing out some empirical questions to be considered for a unified treatment, though we intend to make our analysis compatible with them, as in Saso and Hyams (1994). For example, if root participles are restricted
to the content of AUX + passives in adult languages, rather than in free alternation with declarative finite forms, the root participles are the pure extensions of the AUX elements and different from root infinitives, which are considered to be in free alternation with finite forms. Also, if the two appear differently in developmental data, they cannot be treated as one phenomenon (e.g., Italian root infinitives are very rare, as shown in Chapter 4, but root participles may be more frequent, according to J. Schellinger (p.c.)).

In this way, in this dissertation, we treat root participles as something potentially within the scope of the root infinitive but not as part of a basis for constructing passives.

2.1.2. Early Acquisition of Verb-Placement in French and German

Next, we review findings regarding the placement of finite and non-finite verbs in early stages of the acquisition of some European languages. In this respect, it turns out that child languages behave like adult languages. In contrast to the phenomenon of root infinitives. In languages with overtly distinctive verb-placement depending on finiteness, it was discovered, beginning with Weisgerber (1988), that children from very early on place finite and non-finite verbs in different positions in an adult-like way with few errors (cf. Weisgerber (1994) for the observations in various languages).

For example, Pierce (1992) has demonstrated that Verb-placement of four French-speaking children she examined is highly sensitive to the finiteness distinction.

In French clauses, finite verbs are placed before a negative marker pas, as in (6a), while infinitival verbs are placed after it, as in (6b).

```
(6) a. Jean (n')regarde pas in television.
    watch(INF) not the
b. *Jean (n')regarde la television.
    *Jobs does not watch television.
```

The phenomenon is captured by assuming that there is a functional projection (OMP) for finiteness (or Temp) and AG(agree) as a separate projection of (NOM), which is projected structurally higher than V, and that finite verbs overtly move to I, while non-finite verbs do not (cf. Emmott (1978), Poole (1989), Chemov (1991)). The difference between the derivations is illustrated below.

```
(7) a. finite clause structure in French (cf. Spell-Out)
```

The same kind of result has been obtained for German by Pouppel and Wexler (1993). German is one of the so-called Verb-Souped (VZ) languages. In German root clauses, finite verbs are always in the second position from the left, no matter what the first constituent is, and non-finite verbs are always in the final position of the clause. This is illustrated by the examples below.

```
(10) a. Hans kaufte das Buch.
    Hans bought(INF) that book
    *Hans bought that book.
```

(11) a. Hans stellte das Buch her.
    Hans put in that book brought(INF)
```

b. *Hans das Buch stellte her.
    *Hans had to buy that book
```

The statistical correlation of the two factors, finiteness and ordering with respect to the negative marker pas, is significant at p < .001 by the Chi-square test.
the finiteness distinction is not easily observable, due to the fact that it is a VO-V2-language, but theoretical discussions have revealed that the distinction can be traced to a quite early stage (MLEJ—1.5-2.0, cf. Piitnack (1992)), at least. See Hyams (1992a), Piitnack (1990, 1992), and Wester (1994) on data and analyses of child Swedish.

In some, in acquiring languages with overly different positions for finite and non-finite verbs, children correctly place verbs into the positions corresponding to their finiteness. In this respect, child languages are the same as adult languages.

2.1.3 Generalizations in the Early Morpho-Syntax of European Languages

The two observations discussed seem, prima facie, to be in conflict. On the one hand, the existence of root non-finite verbs suggests that children do not have knowledge of finite inflection at the early stage. On the other hand, adult-like verb-placement which is contingent on finiteness indicates that children do know the distinction between finite and non-finite verbs. This apparent conflict require exploration. What exactly do children know about the morpho-syntax of finiteness? Their knowledge must be rich enough to serve as the basis for the distinction in verb-placement. But it should not be too rich. If children know everything about finiteness, the existence of root infinitives phenomenon, as Guasti herself shows, and then differs from other European languages discussed here. We will discuss the absence of root infinitives in languages such as Italian, Spanish, and Japanese in Chapter 4.

(12) a. root finite clause structure in German (at Spell-Out)

```
NP    CP
  C     V

Haus laufst das Buch
```

b. root finite AUX+infinitival structure in German (at Spell-Out)

```
NP    CP
  C     V

Haus laufst das Buch
```

Poepel and Wester examined one corpus of a German-speaking child, Andreas (available through CHILDLES, cf. Wagner (1985)), and found an adult-like pattern of verb-placement. Here is the contingency table based on sentences with three or more

25

(13) Child German: Verb-placement as a function of finiteness (in sentences with three or more conditions)

<table>
<thead>
<tr>
<th></th>
<th>Finite</th>
<th>-Finite</th>
</tr>
</thead>
<tbody>
<tr>
<td>V2</td>
<td>197</td>
<td>5</td>
</tr>
<tr>
<td>Vinal</td>
<td>31</td>
<td>27</td>
</tr>
</tbody>
</table>

from Poepel and Wester (1993, p. 7).

Here again, the statistical correlation is significant, at p < .0001 by the chi-square test. Similar trends in the contingency between finiteness and verb-placement can be observed for other European languages, too, though similar quantitative analysis is not available for them. See Dittmar (1987) and Wexler (1989) for Dutch. For Swedish,

3 As pointed out in Poepel and Wester (1993), children's sentences with only two words are V2 and Vinal at the same time, because they are (DF, V), hence they are not meaningful in examining whether children distinguish the two positions in verb-placement. The strong contingency still holds for a table which includes these two-word-long sentences, though, as shown in Table 1 of Poepel and Wester (1993).

5 What this data indicates about the existence of functional projections in child German is not straightforward, unlike the case of French, because in German (and Dutch) finite verbs move up to C in root clauses, but move to V, which is classified as a subordinate clause. This is, it is possible that children project L, instead of C, in the V2 position of root clauses (cf. Barriere (1993), Clahsen et al. (1994) and references therein), and if so, the children's distinctive verb-placement indicates the existence of only L and not C. For our purpose here, it suffices to observe that finiteness is distinguished in verb-placement in child German, no matter what the category of the position of finite verbs is. See Mielke and Miller (1992), Poepel and Wester (1993), and Chadace et al. (1994), etc., for issues of functional projections in child German.

6 Guasti (1994) demonstrates the distinction of finiteness in early child Italian by observing the contingency between clitic-placement and finiteness of main verbs. This is not included here because child Italian does not display root infinitives as a productive

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is left unconsidered for. So, we have another question: what part of the adults' knowledge of finiteness do children lack at first? These questions are the main theme of this dissertation, and they will be repeatedly posed regarding the phenomena in language acquisition to be discussed.

Before addressing general issues concerning the morpho-syntax of finiteness, we will first discuss finiteness in child Japanese. We then come back to these questions and deal with them by comparing Japanese and (non-pro-drop) European languages.

2.2 Child Japanese

In comparing child Japanese and adult Japanese with respect to the morpho-syntax of finiteness, we again find both a difference and a similarity. The difference concerns the child's use of finite/non-finite morphology in negative sentences. The similarity concerns the obligations of finite verbs in root clauses. We will first introduce the relevant morpho-syntax of adult Japanese and then turn to the child's data.

2.2.1 Finiteness in Negative Clauses

Unlike in adult Japanese, in which verbs must be inflected as non-finite forms in negation, children optionally produce a finite form of a verb, as well as the adult-like non-finite form in negative clauses. Below, we will review the major aspects of this phenomenon.
2.2.1.1. Negation in Adult Japanese

In adult Japanese, the negative marker na or is a verbal predicate and it carries finite tense in itself. In this respect, Japanese na or is different from English not and many other negative markers in European languages, which are non-verbal elements (e.g., French ne and pas, German nicht, Swedish inte; for negative markers in Romance languages, see Zaanst (1991)).

In affirmative sentences, Japanese verbs and adjectives exhibit no paradigm of tense inflection by changing affixes, as illustrated by examples (14).

| a. | Taro ga eiga o mi-ni na (koto) | Taro saw a film, will not see a film | Taro ga eiga o mi-ni na (koto) | Taro saw a film |
| b. | Taro ga heya ni hito o tsukuru (koto) | Taro enters a room will enter a room | Taro ga heya ni hito o tsukuru (koto) | Taro enters a room |
| c. | tayyo ga shuu-i san-ni wa bright (−P) | The sun is bright | tayyo ga shuu-i san-ni wa bright (−P) | The sun is bright |

Basically, finite verbs and adjectives are produced by attaching tense affixes to their roots for verbs, −na for non-past and −ar- or -ar- in past; for adjectives, it is non-past and -kari-ar- in past. The non-past tense affix varies depending on the final sound of roots: for roots ending with vowels, it is -na (cf. (14a)), and for roots ending with consonants, it is -na (cf. (14b)).

When finite verbs and adjectives are negated, as in (15), the tense morphology is realized on the negative marker na, rather than on the verb or the adjective. The tense inflection on na is the same as adjectives: the past form in (15b).

| a. | Taro ga eiga o mi-ni na (koto) non-finite form see(na)-P not-(-P) | Taro did not see a film |
| b. | Taro ga heya ni hito o tsukuru (koto) non-finite form enter-ERG see(na)-P | Taro did not enter a room |

When the two forms for each verb and adjective are compared, we notice that tense is marked not on the verb or adjective, but on the negative marker, since the latter and the adjective take the same form in the non-past and past. Thus, in Japanese negative sentences, verbs and adjectives themselves are non-finite, unlike in affirmative sentences. The non-finite forms in negation differ for each of the two in (6): for verbal roots ending in vowels, it is the same as the root (cf. (6a)), for verbal roots ending in consonants, it is the root plus na- (cf. (6b)), and for adjectives, it is the root plus kari- (cf. (6c)). In traditional Japanese grammar, these non-finite forms concerning with negation are called "formative" for verbs (i.e., non-finite) and they are called "Adverbial" for adjectives (i.e., non-finite).

In this way, the negative marker na is finite. This being the case, regaining a
finite verb or adjective does not involve simply the addition of a negative marker to an affirmative finite verb or adjective, which is done in many European languages, for that would result in having two finite tenses in a sentence. Rather, Japanese verbs and adjectives are turned into non-finite forms in negative sentences, where the finiteness is carried by the negative marker na.

2.2.2.2. Negation in Child Japanese: Preliminary Observations

Let us now look at how children treat the morphological alternation associated with Japanese negation. At a very early stage in the acquisition of Japanese, it has been observed that children often negate verbs and adjectives by adding na to the right of verbs or adjectives which are themselves inflected for tense, instead of changing verbs or adjectives to their non-finite forms and carrying the tense inflection inside na (cf. Okubo (1987), Chomsky (1985), Ino (1990), etc.). This is not the correct formation of negation in the adult grammar of Japanese, as noted earlier. The contrast between the children's negative error and the adults' correct form is illustrated by examples in (16) for verbs and (17) for adjectives.

(16) CHILD ERROR (adult name, age) ADULT FORM
a. nai- na (Masahiko, 2/6) nai-ne nai
"(I) will/did not ride."

(17) CHILD ERROR (adult name, age) ADULT FORM
a. ki ni nai (Ken, 2/6) nai
"(I) will/did not eat.

Japanese has empty pronominal noun phrases and the examples in (16) and (17) are all sentences with such null arguments. The children's examples above contain either an (+P) or (∼P) inflection on the verb or the adjective and na is to the right of the tense-inflected verb/adjective. In the adult counterparts, however, verbs and adjectives are inflected with Imma or Adverbial (non-finite) aorists and the (+P) or (∼P) inflection appears on the negation marker, as discussed earlier in connection with the adult paradigms in (14). In (18), we summarize these observations.

Henceforth, we will refer to the child's error form as External Negation and the adult's form as Internal Negation. All the labels of affixation for the child error in (30) are based on their superficial forms interpreted in accordance with adult Japanese grammar. It should also be noted that the affix attaching to the root and the negative marker na is almost always a noun particle in the children's errors. The empirical details of these constructions in child Japanese grammatical will be discussed later.

The difference between child Japanese and adult Japanese is that External Negation is optionally possible for children but not possible at all for adults. It is not the case that there is a stage in which all negation takes the form of External Negation. In child Japanese, External Negation is optionally observed, together with Internal Negation. And, in adult Japanese, Internal Negation is not possible. In this respect, it shows an interesting parallel to the root infinitive phenomenon discussed earlier with European languages, since that phenomenon also involves the optionality between finite and infinitival forms.

Now, we attempt to be more detailed and accurate in constructing the empirical foundation of our analysis of External Negation, to the extent possible with available data. That is, we will work out the general picture in (18) and try to make it more exact by reviewing various kinds of data. First of all, the generality of the phenomenon is illustrated by similar types of examples reported in previous studies, which are in (19).

(19) a. tabe- na ni eat (∼P) not '(I) will not eat.'

b. e- ni na eat(+P) not 'I didn't eat it.'

c. na- na ni eat(∼P) not 'I couldn't eat.'

d. kowai- ni scare(∼P) not '(I) am not scared.'

e. sono- ni eat(+P) not '

f. e- ni na eat(+P) not '(I) is not big.'

(a.b., from Chomsky (1985), c.e., from Ino (1990), d, from Ohkubo (1967))

And yet, we may choose to be conservative and cautious about making generalizations based merely on a few examples from different sources. In particular, we would like to mention two relatively straightforward and unsurprising methodological points which we take into consideration in treating children's negation data.
First, children’s negation errors may not be very revealing of the sentence structure if they are preceded by adults’ utterances which are potential targets of imitation. For example, in Suhimak’s data in Nijii (1974-77), there are some examples of External Negation. Unlike in other corpora we examine, Suhimak’s examples are very often preceded by similar adult utterances, and hence may involveaphasic negation with repetitions of the previous adult utterance.10

(20) a. ADULT: aita ne-ko? newspaper take (+P)
   ‘Did you take newspaper?’
   SUSHIMAK: aita ne-ko take (+P) no (-P)
   ‘There is it.’
   b. ADULT: na-ta be (+P) no (-P)
   ‘There is it.’
   SUSHIMAK: na-ta be (+P) no (-P)
   c. ADULT: ka-ta be (+P) no (-P)
   ‘There is it.’
   SUSHIMAK: ka-ta be (+P) no (-P)

10 My thanks for the example list provided to me by Masao Palachuk, who went through the corpus of Nijii (1974-77) and collected examples of negation, among other things, and for Minoru Murakami’s corpora of Nijii’s transcriptions of Murakami (1983). Presentation and interpretation of these data are my own.

In examples of this kind, we do not know for certain if the verbs with tense inflection are really finite or assumed inflections of the previous adult verbs or adjectives. In fact, in the case of Suhimak’s data, there are other examples which seem to be interpretable only as copies of adult speech followed by no, as in (21).

(21) a. ADULT: kotsu ote ‘Come here’
   SUSHIMAK: kotsu ote no (-P)
   b. ADULT: ti-sou ti ‘Give it to me’
   SUSHIMAK: ti-sou ti no (-P)
   c. ADULT: imasit ‘Come here’
   SUSHIMAK: imasit no (-P)

There are two reasons to think that these children’s negations involve copies. First, the verbs in the child’s utterances in (21) are not appropriate for negating the request by the adult, in terms of empathy. Thus, to respond negatively to the imperative ‘come here’

and state ‘I will not come’, as in (21a) and (21b), the appropriate verb is the ‘go’.

Similarly, the negated verb ‘give’ in (21b) should be given, for the reason of empathy; in Japanese, the verbs of giving/receiving have different forms depending on whether the goal of the action is the speaker (e.g., a noun for ‘give’) or not (e.g., a noun for ‘give’). Second, the predicates in adult sentences in (21a) and (21b) are polite forms for ‘come’ which are common as imperatives but not used as non-polar declaratives, in which form is used for ‘come’. Judging from the fact that Suhimak presumably uses these properly at this stage, we judge Suhimak’s utterances not to mean ‘I will not come’, even when we disregard the first point that the verb should be ‘go’ rather than ‘come’ because of empathy.11

In this way, negation by no could be aphasic. Thus, we cannot dismiss the possibility that examples of External Negation involve the unanalyzed copy of adults’ speech when potential targets of such copies precede children’s External Negation, as in (20). Such cases should be distinguished from non-aphasic sentence negations, in which the status of verbal inflection, being non-copies, can be meaningfully investigated. Therefore, we need information about preceding adults’ utterances and about whether the child says in an aphasic way.11

Second, without quantitative information on the proportion of children’s errors, it is not possible to evaluate whether the errors are substantial enough for serious consideration or rather be dismissed simply as minor errors at, perhaps, the level of performance. We need to know the frequency of errors in all the contexts, that is, the ratio of negation errors to the total number of negative utterances. Bearing these methodological points in mind, we provide the negation data of four monolingual Japanese-speaking children. For each child, spontaneous speech samples were individually tape-recorded for 1 hour (or less in some cases), weekly or bi-weekly. Though they were all born in Japan and all the family members were native speakers of Japanese, because the four children were living in Los Angeles in the period of data collection, care was taken to make sure that the children were monolingual. None of the children had steady exposure to English, since they did not attend English-speaking nursery schools during the relevant period. See Appendix of this chapter for some details of linguistic background of each child. None of these children had a command of English syntax, yet the productive combination of two words. Thus, we feel confident that our data are not those of bilingual children. The recordings were done with one or two adult Japanese-speaking, most of the time at the child’s home. Although we were interested in negative utterances during data collection and made some efforts to elicit them from children, there was no such designed experimentation. Thus, the data are essentially spontaneous speech samples.

10 Moreover, there are examples of negation of reflex expressions, such as docho na ‘please cut’, mesora na ‘brown one’, dedikado na ‘sweet one’, not in Suhimak’s data, all preceded by adult speech of the target of imitation.

11 In Suhimak’s corpus, Nijii (1974-77), External Negation is heavily restricted to aphasic negation. This may have to do with the fact that the child spoke the Hiroshima dialect and produced negation with -no, as in ‘I won’t go’, from very early on. In any case, since we do not treat the aphasic type of negation, preceded by
In calculating the proportions of External Negation, we tried to eliminate possible causes of imitation of adult speech discussed previously. We did not include children's utterances of External Negation when they were preceded by an adult utterance ending with the same verb or adjective in children's negation. Hence, we evaluate the frequency of clear cases of External Negation within the conservative approach. The tables with numbers of External Negation and Internal Negation with verbs and adjectives, respectively, are given below. Recall that External Negation means a finite form followed by Neg and Internal Negation means correct adult Negation.

Since our purpose here is only to observe the frequency of External Negation, we focus on the conventional cases in deciding what counts as External Negation and Internal Negation. That is, negated lexical verbs of finite form belong to External Negation, and negated lexical verbs of non-finite form belong to Internal Negation, and the finite/non-finite distinction is based on the usage in adult Japanese. The apparent finite forms may in fact be non-finite for the Japanese children — as we will later argue — but for now we make the judgement solely on the basis of appearance in terms of adult Japanese usage. We put aside the negation of auxiliary verbs. We will take them into consideration when we turn to our analysis and discussion of External Negation.

What follows is a table of data on negation types for verbs and adjectives from the four Japanese-speaking children.

<table>
<thead>
<tr>
<th>Child Name: Motooru</th>
<th>Neg with Verbs</th>
<th>Internal Negation</th>
<th>Neg with Adjectives</th>
<th>Internal Negation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Neg with Verbs</td>
<td>Internal Negation</td>
<td>Neg with Adjectives</td>
<td>Internal Negation</td>
</tr>
<tr>
<td></td>
<td>2,5-2,6</td>
<td>3</td>
<td>2,5-2,9</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2,7-2,9</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

In the data above, we observe that three of the four children produced External Negation with verbs quite frequently (i.e., 30-55%). Since we excluded all cases of potential imitation, our estimate is conservative and hence it seems safe to claim based on the above data that External Negation is a grammar-based phenomenon which can (optionally) arise in the acquisition of Japanese.

The development of these children may be relatively slower than usual. However, the age can only be a preliminary measure of comparison, and the data in Table 2.2 above covers the stage of optional External Negation as much as possible.

Since the total number of negation of adjectives is less than 10 for all children, we exclude them in our analysis of External Negation. However, the analysis should be extendable to cover the adjectives as well, and we will at a later point make a brief remark on this matter.

In any, we have discussed negative clauses, with respect to which child Japanese

<table>
<thead>
<tr>
<th>Child Name: Yumi</th>
<th>Neg with Verbs</th>
<th>Internal Negation</th>
<th>Neg with Adjectives</th>
<th>Internal Negation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Neg with Verbs</td>
<td>Internal Negation</td>
<td>Neg with Adjectives</td>
<td>Internal Negation</td>
</tr>
<tr>
<td></td>
<td>2,2-2,8</td>
<td>2</td>
<td>2,2-2,6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2,9-2,11</td>
<td>3</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>2,9-2,11</td>
<td>3</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

This, we find that children sometimes produce verbs of finite forms under negation, and otherwise produce correct non-finite forms under negation. This is in contrast to adult Japanese, which obligatorily requires negated verbs to be non-finite. We have observed that the phenomenon of Optional External Negation is substantial. As noted earlier, the alternation between finite and non-finite forms under negation appears parallel to the root infinitive phenomenon observed in the (non-pen-dup) European languages. But are there root infinitives in child Japanese? We turn to this issue directly.

2.3.2. Finiteness in Affirmative Root Clauses

In adult Japanese, main verbs in affirmative root clauses must bear finite tense. This requirement is perhaps universal, not at all particular to Japanese. However, we have two good reasons to investigate whether the requirement is met in child Japanese. First, recall that many non-finite verbs are observed to occur in root clauses as main verbs in European child languages, as we saw in section 2.1.1. Second, the optional alternation differs from adult Japanese regarding the finite morphology of the negated verb, stated below.

(G2) Optimal External Negation:

At an early stage, Japanese-speaking children optionally produce verbs of finite forms in negative clauses.
between finite forms and non-finite (irrealis) forms in observed negative clauses in child Japanese, as we have just seen in section 2.2.1. Thus, it must be empirically established whether non-finite forms exist as main verbs in affirmative root clauses in child Japanese, in order to investigate whether the optional Root Informativeness in European languages and optional Extraposition in Japanese are derived from the same underlying source.

### 2.2.2.1. Adult Japanese: Finite and Non-finite Verbs

Before considering the child data, let us quickly review the morphology of Japanese finite and non-finite verbs. On this question, it should be noted that, in Japanese, the form of an inflectional affix may differ, depending on the final vowel of roots. Verbs with roots ending with a consonant are called consonantal verbs, and the verbs with the roots ending with a vowel are called vocalic verbs (cf. Block (1956)). By giving examples of both classes, we will illustrate the inflectional affixation of the following forms: meep (for or past finite tense, and among non-finite forms). At issue in section 2.2.1, a finite verb is either non-finite or past. The non-finite form is derived by attaching an affix -ta to the end of a root: more specifically, the affix is -ta for conversational verbs, as in (23a) and -tu for vocalic verbs, as in (23b). The

---

**Note:** Whether the contrast in Japanese finite tense is post-nasal or pre-nasal imperfect could be controversial. However, our purpose here is to observe children's distinction of four items. As long as finite forms are explicitly distinguished from non-finite forms (e.g., on the basis of possibility of occurring in root clauses), we can remain neutral and need not attempt to resolve the controversial point.

---

### Examples of finite forms in (24).

(24) a. bair-i enter-ta (P)′
   "enter (past)"

b. mir-i see-ta (P)
   "see (past)"

---

### The morpho-phonological derivations of non-finite affixation, we adopt the deletion analysis in Block (1956) and McCoardy (1976): the non-finite affix is -ta, and the /tl/ deponents when it is attached to the root of conversational verbs, because it is otherwise realized in ill-formed genitives. However, this is not very crucial for our current purpose, since we only need to check the distribution of finite and non-finite forms in children's data.

---

### We will consider those non-finite forms which we will examine in the children's data to see whether these non-finite forms show up in root affirmative clauses. In

---

### Other non-finite forms include: Hypothetical (susu-tai, e.g., bair-i enter-ta, mir-i see-ta), Imperative (metro-tai, e.g., bair-i enter-ta, mir-i see-ta), etc.

---

### Introducing each of these stages below, we will concentrate on those which appear in children's early data. The first is bair-i (i.e., meep-ta), which arises under the negative predicate nai. It consists of a root and an affix -ta for conversational verbs (e.g., bair-i for bair-i enter-ta), and it is equal to bare roots for vocalic verbs (e.g., mi for mi mi see-ta). Since we have already discussed this, we simply list two examples.

(25) a. Taro ga kore ni hair-i na i (kans)
   Taro see this in enter- (P)′
   "Taro does not enter into this"

b. Taro ga kore o mi na-kaisa-i (hons)
   Taro see this nose-mark (P)
   "Taro did not nose this"

---

### The irrealis forms themselves are non-finite and the finite tense is realized in the matrix negative predicate.

---

### The second non-finite form of concern to us is a form called Adverbial (i.e., renopo-ki). Though this form in the paradigm of adjectives is close to adverbs, it is rather close to the infinitival form in the verbal paradigm, when compared with European languages. It consists of a root and an affix -ki for conversational verbs (e.g., hair-i for bair-i enter-ta), and it is equal to the root for vocalic verbs (e.g., mi for mi mi see-ta). It occurs as the main verb of embedded clauses, in a way similar to the participial constructions in English.

---

### See Ohta (1994) for the general structural properties of renopo-ki.

---

### The case of the subject of the embedded clauses headed by Adverbial verbs and the Contrafactual -ki, which will be discussed shortly, is a controversial issue. Since the so-called adverbial ga is assigned to the subject in the embedded clause headed by Adverbial verbs, as well as to the finite root clause, this poses a problem in the straightforward extension of Case systems of European languages. In Kadotani (1985), Saikyo (1982), and Fukuoka (1986), it is argued that Japanese is assigned by insertion into mechanisms and independent from tense. See Yamauchi (1987) for arguments for tense-dependent non-finite Case in Japanese. See Fukuoka and Nakagawa (1993), Miyagawa (1993), Uem (1993), etc. for recent developments of Case theories of Japanese.
The examples in (23) are synonymous with those in (26). Moreover, this non-finite root, form root + -te, is partitive also in the sense that it concurs with auxiliary-type predicates such as the be, are be, the so, and the like, bearing suppletive meanings. Rather than listing various examples, we look at only the case of the progressive, which is the most common usage in the child data.

(23) a. Tan ga hace o ni-te ina.
    "Tan is seeing this."

b. Tan ga nite ina.
    "Tan was walking."

(CF: Conjective)

In the progressive examples above, once again, we see that the finite noun+past alternation is realized in the matrix predicate inala, hence the -te forms themselves are non-finite.

The forms to be examined are summarized in the table below.

2.2.2.2. Child Japanese: No Root Definiteness

The three non-finite forms we have seen, Adverbial, Intrans, and Participial, cannot appear as main verbs of root clauses in adult Japanese. Root clauses must have finite main verbs obligatorily, perhaps universally. However, we already know that child languages do not necessarily adhere to this requirement, given the facts of child European languages reviewed earlier. Below, we present quantitative data showing that root non-finite forms do occur in child Japanese.

The verbal inflectional forms summarized in the table (32) are examined with the three children who produced optional External Negation for the period in which External Negation is observed. Let us start with the Intrans and Adverbial forms. First of all, we have to make sure that these non-finite forms are correctly used as non-finite in the data. This is shown in Table 2.3. Below, Intrans under the negative predicates no is often found for all three children. Adverbial under the desiderative predicate aos is never
compared to that, but is frequent in Ken's and at least exists in the lexicon of the other two children.

Table 2.3: Verbal and Adverbial concordance with finite predicates

<table>
<thead>
<tr>
<th></th>
<th>Toshi (2;3-2;0)</th>
<th>Ken (2;3-2;10)</th>
<th>Maosan (2;4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>root+</td>
<td>24</td>
<td>71</td>
<td>14</td>
</tr>
<tr>
<td>Adverbial+</td>
<td>1</td>
<td>34</td>
<td>24</td>
</tr>
</tbody>
</table>

This reflects the phenomenon of optional root non-finite main verbs in universal, it is expected that the Intransit and Adverbial forms would be found as main verbs of affirmative clauses in the data under discussion.

However, as shown in Table 2.4 below, the inflection of main verbs in affirmative Root Clauses is almost completely restricted to finite root or past in child Japanese. For all the three children, Adverbial and Intransit is almost completely non-existent as main verbs of affirmative Root Clauses.

Table 2.4: Inflection of Main Verbs in Affirmative Root Clauses

<table>
<thead>
<tr>
<th></th>
<th>Toshi (2;3-2;0)</th>
<th>Ken (2;8-2;10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>root+</td>
<td>104</td>
<td>111</td>
</tr>
<tr>
<td>Adverbial</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Intransit</td>
<td>0</td>
<td>1 (0.3%)</td>
</tr>
</tbody>
</table>

This contrasts with child European languages which exhibit root infinitives, specifically non-past-root European languages at the child stage. We will provide an explanation for the difference in Chapter 4.

Similarly, in the same children's data, the Conjunctive form -er is also restricted to non-finite contexts. The Conjunctive -er must be accompanied by finite auxiliary in root clauses in adult Japanese (cf. (31)), and the restriction appears to apply to child Japanese, too, as shown by Table 2.5 below.

Table 2.5: Root and Non-root -er

<table>
<thead>
<tr>
<th></th>
<th>Toshi (2;5-2;2)</th>
<th>Ken (2;8-2;10)</th>
<th>Maosan (2;4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>root+</td>
<td>35</td>
<td>13</td>
<td>22</td>
</tr>
<tr>
<td>-er</td>
<td>1 (3.8%)</td>
<td>0</td>
<td>(73)</td>
</tr>
</tbody>
</table>

The three examples of Maosan are all followed by self-correction with appropriate finite auxiliaries. It seems safe to interpret the data to be indicating that the participles -er is not at all productively used as the main verb of root clauses.12

In this way, we have observed that the non-finite forms, Intransit, Adverbial, Conjunctive -er, are not used as main verbs in affirmative root clauses in child Japanese, in contrast to child European languages.

2.3.3. Generalizations in the Early Morpho-Syntax of Japanese

There are two results of our examination of the morpho-syntax of child Japanese. On the one hand, the possibility between non-finite Intransit forms and finite forms in negative clauses suggests that there is something that children do not know about the inflection of infinitives at the early stage. On the other hand, the obligatory use of finite forms as main verbs in affirmative root clauses indicates that they do know the distinction between finite and non-finite verbs. In the next section, we will compare these results with the findings in child European languages we reviewed earlier, and attempt to discover universal generalizations, distinguishing those from language-particular phenomena.

2.3. On Universal Principles of Early Morpho-Syntax in Language Acquisition

Let us see what common properties we can cite from the comparison of Japanese and European languages. Weinert (1994) notes out four generalizations in (22) on the grammatical properties of finiteness in European child languages.

---

12 Describing his data and insights in other studies, Cherry (1985, section 4.1) suggests that the -er form is overgeneralized as the main verb of non-imperative root sentences. This is the opposite of our observation. The difference may come from the treatment of "independent subordinate clauses." That is, even in adult Japanese, it is possible and normal to have the -er form as the main verb of a non-imperative sentence. It simply sounds like a novel subordinate sentence. It is not difficult to see whether children's utterances are of this kind or other such as progressive, existential, or imperative, since the latter group can be quite clearly identified from the context.

13 If the Conjunctive -er form is totally equivalent to the participles in European languages, it might be the case that we should treat it differently from other non-finite forms, as we did with root participles in European child languages. However, the Conjunctive -er may combine with an AUX other than be' and have meanings which do not correspond to participles in European languages (e.g., Verb mina "la in V", You do "going to V", etc.). Thus, we consider it together with Intransit or Adverbial forms.
There is an early stage in which the child:

(G1) knows the possibility of head (in particular V-) movement

(G2) knows that head movement is formed in the finite case

(G3) knows the Principle of Economy which implies that infinitival verbs do not move

(G4) does not know that non-finite verbs cannot appear as main verbs.

(G) in Wedel (1994, p.312)

We refer to these as G1-G4.

The first three generalizations are manifested in the placement of finite and non-finite verbs, which is visible only in negative clauses in French or in V2 languages. Since finite and non-finite verbs are observed to appear in different positions in such cases, the functional head (V), distinct from the verbal head (V), must be in children's grammatical vocabulary, as stated in (G1). Furthermore, the grammatical principles governing the movement of finite and non-finite verbs must be active in the child language, as stated in (G3) and (G5). The generalization (G4) reflects the root infinitive phenomenon. Even in European languages, this is specific to child languages; that is, it is not part of grammatical knowledge of adults.

As for child Japanese, we find the distinctive treatment of finite and non-finite verbs, which leads to (G1)-(G3), with respect to affirmative clauses. We have seen that only finite forms appear in main verbs of affirmative clauses in child Japanese, unlike (non-pro-drop) European child languages. This indicates that non-finite forms are differentiated from finite ones, and the distinction requires head movement in the theoretical framework we are assuming. To restrict the main verbs of root clauses to the finite forms, children should be able to distinguish verbs by the specification of finiteness. Without two different heads, I and V, and moving one form (i.e., the finite form) V-to-I and keeping the other form (i.e., the non-finite form) in situ in V, verbs cannot be differentiated in their interpretation with respect to finiteness, in the theory we are assuming. Hence, (G1)-(G3) hold for child Japanese. From theory-neutral, the lack of root non-finite forms suggests that children have knowledge of the finiteness distinction, and (G1)-(G3) simply state this theoretically.

Contrary to the situation with European languages, the evidence for the finiteness distinction in child Japanese does not provide evidence for overt movement of finite verbs. Given that finite verbs move to I and in this sense they are differentiated from non-finite verbs, the lack of root non-finite verb follows. So, covert VP movement of finite verbs can be compatible with child Japanese. In this particular sense, there is a difference between Japanese and European languages with respect to (G1)-(G3). The surface word order of European languages requires overt V-to-I head movement.

The generalization (G4) cannot hold for child Japanese, given the lack of non-finite forms in affirmative root clauses. This means that the existence and appearance of root non-finite forms is not controlled solely by the limitation of UG principles and that it should involve the acquisition/learning of some language-particular properties, which is ultimately mapped to morphological realization. We will come back to the question of the origin of the root infinitive phenomenon in Chapter 4.

In addition, there is the question of the origin of optional existential negation phenomenon in child Japanese. This will be the main topic of the next chapter.

Appendix to Chapter 2: Linguistic Background of Children

Child Name: Teaki
born on February 15, 1990
came to Los Angeles in March, 1991
observation started April 3, 1991 (2/2)
observation ended February 3, 1992 (2/11)
siblings: none
native language of parents: both Japanese
language at home: Japanese only
language at nursery school: English (mostly non-organized seminars)
attendance at nursery school: 2-3 times a week starting October, 1992

Child Name: Ken
born on July 13, 1989
came to Los Angeles in March, 1991
observation started April 3, 1991 (2/2)
observation ended June 11, 1992 (2/11)
siblings: a elder sister (born on November 13, 1986)
native language of parents: both Japanese
language at home: Japanese only
language at nursery school: no attendance at nursery school

Child Name: Masanori
born on August 19, 1991
came to Los Angeles in April, 1992
observation started December 20, 1992 (2/4)
observation ended June 5, 1994 (2/2)
native language of parents: both Japanese
language at home: Japanese only
language at nursery school: no attendance at nursery school

Child Name: Masato
born on August 8, 1989
came to Los Angeles in September, 1992
observation started January 13, 1993 (2/2)
observation ended September 18, 1992 (2/1)
siblings: a younger sister (born in July, 1991)
native language of parents: both Japanese
language at home: Japanese only
language at nursery school: Japanese
attendance at nursery school: 2-3 times a week, period uncertain
In this chapter, we will discuss the phenomenon of optional External Negation in child Japanese. In the last chapter, we pointed out certain generalizations in early child language by comparing Japanese and European languages. Since these generalizations refer to abstract syntactic properties which hold cross-linguistically, they should be part of an innate linguistic capacity, namely UG. In contrast, the origin of External Negation is still an open issue. We do not yet know if it originates from the immaturity of some part of UG, from the mismatching of some parameter of UG, or from the delay of acquisition (or learning) of some language-particular properties. This delay in acquisition may be viewed as morphological maturation, since such a delay is ultimately rooted in the restriction of the capacity to 'intake', or absorb, the relevant input data (cf. White (1982, p.31) on the notions of 'intake' and 'input', referring to Chomsky (1965)).

We will consider the following three possibilities. The first is to assimilate the optional External Negation phenomenon to the optional root infinitive phenomenon in a unified way. The second is to view it as the mismatching of a parameter determining the position of NEG. The third is to trace it to the delay in acquisition of a specific aspect of Japanese, namely the non-finite Irematsu form under negation. This delay may be construed as the morphological maturation of the capacity to construct Irematsu forms. Eventually, we will argue for the third analysis after considering the predictions made by such hypotheses with respect to children's data.

---

3.1. External Negation and Root Infinitives

In this section, we will first of all introduce the structure we adopt for negative clauses in adult Japanese. Then, we will propose two structures for children's External Negation by drawing an analogy with the two patterns proposed for negation in child English. One of the two patterns, the structure which posits NEG in a clause-external position, suggests the possibility that the phenomena of optional External Negation and optional root infinitives attested in European child languages arise from the same underlying cause. However, we will argue that this analysis is untenable.

3.1.1. The Structure of Negative Clauses in Adult Japanese

We assume that negative sentences in adult Japanese have the structure in (51). The negative marker in a finite predicate and it rises from NEG to V1. V is inflected as

---

1. Two points on the structure of Japanese negative clauses must be made here. First, in Japanese, it is not crucial for as to post NEG if it is an independent phrase. It suffices to take out as an auxiliary on a per verb are 'be' or others. Nevertheless, we adopt the label NEGIs/2 to facilitate comparison with other languages. Second, the projection of phrases and inflectional affixes will be discussed in Chapter 4. These may be various versions, for example the following three and their combination: the phrases and affixes project separately which is followed by affixation by movement (cf. Chomsky (1995b)); or if they are amalgamated in the licensor and the affixes are shifted by movement (cf. Chomsky (1993)), or as they are transposed by some other means (cf. Mazzociti (1994), Hall and Mazzociti (1995), Lardieri (1994)). The structure in this chapter are drawn in accordance with the system to be developed in Chapter 4, which adopts affixation by movement as in Chomsky (1991) for a type of language which includes Japanese. At any rate, this point is not crucial for the discussion in Chapter 3.
not; they select inflected forms such as Irrealis, Adverbial, etc. This other category includes auxiliaries such as passive aux, which select Irrealis forms, deictic aux, which selects Adverbial forms, etc. The past affix -es, which selects Adverbial forms, belongs to this latter category, unlike the copula -be, because -be can inflect as -are (hypothetically) or -was/were (past passive). (See Table 3.2, which will appear later in section 3.3.3.2 for the classification with examples.) Since the negative predicate is an auxiliary and may inflect, it should attach to some inflected form, namely Irrealis, rather than to bare roots, according to the morphological generalization, as suggested by Shibatani.4

In this thesis, we adopt Shibatani’s (1990) system of inflectional-morphology for Japanese. In particular, we positulate Irrealis affixes *-er or *-er and have no *-emes as the negative marker. Aside from this morphophonological treatment, our structure is essentially the same as standard analyses, and requires no further justification (cf. Kane (1985) for a comprehensive study on Japanese negation). The result of our examination of negation in child Japanese will turn out to be compatible with Shibatani’s system in some interesting respects. We will discuss one such case in section 3.3.2, and also at the end of Chapter 4, we will come back to the correlation of our analysis in this dissertation with Shibatani’s inflectional morphology.

5.1.2. The Structural Patterns for the Analysis of External Negation

Our current concern is the following: how is the structure of External Negation different from the adult native clause structure in (3)? In addressing this question, we introduce two structural patterns proposed for the analysis of corresponding negation errors in child English, and then apply them to child Japanese.

It has been observed that negative markers are often placed in sentence-final position in early child English, as in (3), in contrast to adult English (cf. Bloom (1970) and references under the examples, among others).

(3) a. No I am not track.
   b. Not Faster end it.
   c. No Money doing.
   d. No book have it.

(A.b. from Bellugi (1967), c. d. from Defrue and Pierce (1993))

This error is similar to child Japanese External Negation, which we have been discussing, in that these negative clauses are deviant in adult English syntax, though the position of the negative marker is the opposite of child Japanese: clause-initial in child English and clause-final in adult Japanese.

Omitting discussion of the semantic status of these negation sentences in children’s grammar, we review two proposals concerning their structure.5 The classical analysis posits different phrase structures for children and adults. Specifically, Klirr and Bellugi (1960), Bellugi (1967), and Menn and Bellugi (1969) positulate that the negative marker is attached onto matrix clauses, as in (3), in child English.

(3) IP
   \[ \text{NEG} \]
   \[ \text{NS} \]
   I see truck

The negative structure in (3) is not allowed in adult English syntax and hence it must be somehow replaced by the adult structure at some point in language development.

In contrast, Defrue and Pierce (1993) argue that the structure of such neg-initial sentences is the same as that in adult English except that subjects remain in Spec of VP, as in (4) (cf. Fodor (1980), Klirr (1966), Kuno and Stockwell (1968), Kuroda (1988) for the VP-internal subject in adult syntax).6

(4) IP
   \[ \text{NEG} \]
   \[ \text{NS} \]
   \[ \text{VP} \]
   I see truck

On this view, the structure of negative sentences is the same for children and adults.7 The shift to the adult grammar involves the acquisition of subject raising from SPEC of VP to SPEC of IP. According to Pierce (1993), this is triggered by the input data of negative sentences and non-interactive sentences containing modals and auxiliaries, given that they contain clear evidence of subjects being to the left of NEG or 1.

4 Whether or not the NEG head or in SPEC of NEG is not obvious. Defrue and Pierce place it in SPEC of NEG, but the decision should be contingent on various theoretical issues such as the blocking effect of L-reading of finite verbs, which triggers do-insertion, even if the placement is assumed to be continuous in development. Since we are discussing the English structures for the sake of comparison only, we place it in the head of NEG for the purpose of making the comparison with Japanese easier, and nothing hangs on this point.

5 See Cruse (1972) and Leekman (1988) for earlier proposals that the negative markers in child languages occupy the same position as in adult languages.
A comparison of the two structures above illustrates the essence of the decision we have to make in analyzing External Negation. In dealing with the structural differences between negative clauses in child languages and adult languages, we end up claiming that the child structure is different from the adult structure with respect to the position of either the negative marker or some other piece of the sentence — the subject NP in the case of Diéz and Piñe (1993).

We can view child Japanese with two parallel patterns. External Negation has the structure in (5), if the form of the deviation from the adult structure is the position of NEG, which is adjusted to the right periphery of the clause, though this is not the case in the adult grammar (cf. the adult structure in (6)).

(5)

```
<table>
<thead>
<tr>
<th>IP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neg</td>
</tr>
</tbody>
</table>
```

This is suggested in Lis (1990) and Holmberg (1992). It leads us to claim the following: (a) Neg is non-finite or non-verbal and adjusted to finite IP in children’s External Negation, and (b) the verbs with finite affixes in External Negation are indeed finite (cf. the finite forms of verbs in External Negation are heavily restricted to non-finite forms, that is, past verbs are rare in External Negation, as we will discuss later).

(6)

```
<table>
<thead>
<tr>
<th>IP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neg</td>
</tr>
</tbody>
</table>
```

Here is a short comment on the status of Neg. By “non-verbal NEG,” we mean NEG’s such as English not or French pas. It is not obvious what “non-finite NEG” could be in this adjusted context. It could be impossible on independent theoretical grounds. The possibility that Not is “non-finite” in External Negation is hypothesized, simply because, in External Negation, verbs take the finite forms and Neg is almost always unmarked. That is, if we rely on superficial morphology, it appears that the negated verb is finite and Neg is not. We will not have to distinguish “non-verbal NEG” and “non-finite NEG.” It suffices for us to understand that NEG in (5) is adjusted to IP and it is not a finite auxiliary. We will discuss the finiteness of Neg later in section 3.4.

A variant of the analysis in (5) is to posit a bi-clausal structure for External Negation, having both the verb and NEG as finite, as in (7).

(7)

```
<table>
<thead>
<tr>
<th>IP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neg</td>
</tr>
</tbody>
</table>
```

In this bi-clausal structure, the tense affix is attached to the verb and the negative marker is both finite, exactly as in adult Japanese. However, this structure deviates from adult Japanese in that NEG takes the finite IP complement; in adult Japanese, negation of finite

clauses requires complementation of the clause by a subordinating phrase as de wa, which normalizes the lower clause, as in (8).

(8)

```
<table>
<thead>
<tr>
<th>IP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neg</td>
</tr>
</tbody>
</table>
```

This, using the bi-clausal structure (9), we might posit that children’s External Negation involves the omission of the subordinating phrase as de wa, leaving aside the question whether the omission is structural or phonetic. However, negation such as the example given in (7) is distinctive from subordinating negation in meaning, in that it is non-finite without presupposition regarding the embedded clause. Thus, the bi-clausal analysis is not appropriate unless semantic discontinuity on this point is assumed, since External Negation in child Japanese occurs in contexts without any presuppositions. For this reason, we do not pursue this as our main candidate structure. We will come back to this later and show that the arguments against (5) to be preserved below will apply to the bi-clausal analysis as well (cf. section 3.3.3).

Hence, if the position of NEG in External Negation is not different from the adult structure, the finite non-finite affix must be the source of the discontinuity between child and adult syntax of negation, in contrast to the previous proposals illustrated by the structure in (5). That is, on this view, children wrongly put the non-finite form as a non-

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<p>| | |</p>
<table>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VP</td>
<td>Neg</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

finite form selected by the finite NEG. The structure is illustrated below.

(9)

```
<table>
<thead>
<tr>
<th>IP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neg</td>
</tr>
</tbody>
</table>
```

The claims that follow from this analysis are the opposite from those of the previous structure in (5): (i) Neg is a finite verbal predicate even in child Japanese, (ii) in External Negation, children may unnecessarily use finite forms in lieu of the finite non-finite form.

From this point on, we will attempt to identify the correct structure of External Negation mainly by discussing the two structures in (5) and (6).

3.3.3. External Negation = Root Definiteness

One candidate for the source of External Negation in child Japanese is the status of NEG. According to this idea, children’s External Negation exhibits a different NEG from the adult structure. There are two possibilities. One is to claim that children’s NEG is almost different from the adult’s. The other is to claim that children’s NEG differs from the adult’s in External Negation, but it is the same as the adult’s in Internal Negation, which is optionally found at the stage of External Negation. In this subsection, we
discuss the first option, and we will address the second possibility in section 3.2.

To be concrete, in the proposed child Japanese structure in (5), reported below, NEG is non-finite or non-verbal and is a clause-external position, while, in adult Japanese, it is a finite auxiliary (finite verbal) in the position lower than I (finite clause-external) (cf. (1)).

(5) Internal Negation by the RI analysis

<table>
<thead>
<tr>
<th></th>
<th>IP</th>
<th>V</th>
<th>NEG</th>
</tr>
</thead>
<tbody>
<tr>
<td>µ</td>
<td>I</td>
<td>V</td>
<td>nil</td>
</tr>
<tr>
<td>Y</td>
<td>=-(finite)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>=-(non-finite/non-verbal)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thus, in (5), External Negation is lost because NEG has a different status than it does in the adult's grammar. Below, we will show that this structure (and the status of NEG in (5)) cannot be adopted as the only case for the negation structure of children producing External Negation. In other words, we will argue in this subsection that the misanalysis of the NEG element cannot be the unique cause of External Negation.

If verbs are finite and NEG is adjusted as a clause-external position in External Negation, we may be able to link the possibility between finite forms and non-finite Isralis forms in negation at the External Negation stage to the root infinitive phenomenon in European child languages, which also displays the alternation of finite verbs and non-finite verbs as root main verbs (cf. section 2.1.1). If this analysis were successful, then no additional account for the possibility in child Japanese would be necessary, and it would be addressed under the account of root infinitives, whatever it is. Let us call this Root Infinitive (RI) analysis.

The RI analysis predicts finite verbs work well for negation. Negation in child Japanese may be either External Negation or adult-like Internal Negation, as we observed in section 2.2.1. As noted there, it is not the case that all negation is External Negation in child Japanese. If NEG in child Japanese is adjusted to IP, as suggested by the RI analysis under discussion, External Negation may be analyzed as in (5) and Internal Negation may be analyzed as in (6).

(6) Internal Negation by the RI analysis

<table>
<thead>
<tr>
<th></th>
<th>IP</th>
<th>V</th>
<th>NEG</th>
</tr>
</thead>
<tbody>
<tr>
<td>µ</td>
<td>I</td>
<td>V</td>
<td>nil</td>
</tr>
<tr>
<td>=-(non-finite Israels)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>=-(non-finite/non-verbal)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In (6), the main verb of the clause is a non-finite (presso) verb, as in the root infinitives in European child languages, in contrast to (5), which has a finite verb as the main verb. Why this may be necessary (or, more precisely, somewhat underspecified with respect to its feature) in (6) must be explained. But this explanation is not necessary merely for the sake of External Negation, under this analysis. It would be also necessary for RI's in European child language, in which I is also empty by hypothesis (cf. Chapter 4 on the analysis of RI's). Hence, no additional proposal is necessary for Japanese External Negation under this analysis.

However, the RI analysis wrongly predicts that root infinitives exist in affirmative clauses in child Japanese. Since NEG is adjusted to IP under the RI analysis, negative clauses are derived simply by adjusting NEG to affirmative clauses without affecting their intrinsic structure. In other words, affirmative clauses under the RI analysis are "what remains after removing NEG from negative clauses". Then, all else being equal, the possibility between finite and non-finite forms is expected to be found in affirmative clauses, as well. However, as demonstrated in section 2.2.2.2 (cf. Table 2.4), this is not the case. There are virtually no non-finite main verbs in affirmative clauses in child Japanese, unlike European child languages. This is an empirical problem for the RI analysis. Therefore, it is imperative to analyze NEG in child Japanese as always adjusted clause-externally.

Next, we will discuss how to account for External Negation without wrongly overgeneralizing root infinitives in affirmative clauses in child Japanese.

3.2. The Analysis of External Negation

In this section, we develop our proposal concerning External Negation in child Japanese.

We will compare the following two analyses. One is to posit two NEG elements in child Japanese: a non-finite/non-verbal element adjusted to IP for External Negation, and an adult-like auxiliary for Internal Negation. According to this, External Negation still originates from a NEG element error. The other analysis is to claim that the NEG element in child Japanese is always an adult-like auxiliary, and that External Negation originates from an error of Israels forms, that is, the child wrongly uses nonfinite form as Israels under negation. Morphological considerations of children's data lead us to argue for the latter analysis.

3.2.1. Parameter Missetting vs. Morphological Maturation

Taking into consideration the fact that NEG in early child Japanese cannot be a clause-externally adjusted element across-the-board, as shown in the previous section by the lack of root Israels in affirmative sentences, two options remain with respect to the status of NEG at the stage of External Negation, given that Israel verbs are not overgeneralized as root main verbs of affirmative clauses. We will compare them below.

The first option is to assume two NEG's for child Japanese: one is an adult-like auxiliary NEG below I for Internal Negation, and the other is a clause-externally adjusted NEG for External Negation. We will call them Inner NEG and Outer NEG,
respectively. The Outer NEG can be identified as the NEG in some Romance languages or Basque (cf. Laka, 1990, Zwartendijk, 1991). Provided the existence of these languages with Outer NEG’s (e.g., Basque (a)), Italian (a)) and others with inner NEG (e.g., English (a), French (a), Italian (b)), this analysis can be viewed as a case of parameter setting: given the two options available in UG, children at first cannot decide between the two and place null in either of them, optionally. We call this the Parameter Setting analysis. This analysis does not call for any maturation of UG, hence the claim is restrictive in this sense. Still, of course, a developmental difference between child languages and adult languages inevitably requires some kind of maturation, and External Negation is not an exception even under the Parameter Setting approach. In particular, parameter setting accounts always face the “triggering problem” (cf. Beattie and Waxter, 1987), and hence some maturation must be assumed to derive the stage of prior to and subsequent to the triggering of the correct setting. 33

33 Laka (1990) argues, on the basis of her synchronic observations of Basque negation, that T must c-command NEG at S-structure, while NEG is higher than T at D-structure of Basque. It seems an overgeneralization to extend Basque’s negation to External Negation in child Japanese, since none of the same observations can be made. Basque, as well as Romance languages, is mentioned here simply to point out that NEG above T is argued for in some adult languages.

34 Strictly speaking, the “setting” here is rather “open setting” of a parameter, rather than a resetting, in the sense that children have both Outer and Inner NEG’s, not just the Outer NEG, while adults have the Inner NEG only. We continue to use the term “resetting” in referring to this type of “open setting,” to avoid complicating the terminology.

35 Thus, children are delayed access to the triggering data by the assumed immaturity, though the triggering data exists in the input. The Parameter Setting analysis requires clarification of the kind of data that may serve as the triggering data. In this particular

According to this analysis, the optional use of the two kinds of negation in child Japanese lies in the possibility of the location of NEG. The two structures suggested by the Parameter Setting analysis are illustrated below.

(10) PARAMETER SETTING ANALYSIS

a. External Negation

\[
\text{VP} \rightarrow \text{Neg} \rightarrow \text{fin}
\]

b. Internal Negation

\[
\text{VP} \rightarrow \text{Neg}\]

According to this analysis, the finite tense affix in External Negation is indeed finite, and children must discriminate the Outer NEG at some point in development.

36 issue of the developmental shift of negation, too, may be a problem, since it is not obvious what data may elicit the projection of Outer NEG, once it is allowed for child languages. In this sense, the analysis faces the reset problem (cf. Berwick, 1985). Waxter and Maratsik (1987), since a language with inner NEG only is a subset of a language with both Inner and Outer NEG.

(11) MORPHOLOGICAL MATURATION ANALYSIS

a. External Negation

\[
\text{VP} \rightarrow \text{Neg}\]

b. Internal Negation

\[
\text{VP} \rightarrow \text{Neg}\]

This analysis involves no developmental change at all in the status of NEG.

We will eventually argue for the latter analysis of maturation in the lexicon, based on morphological observations. But before that, we must briefly digress to discuss the inflectional morpho-phonology of Japanese verbs.

3.2.2. Two Kinds of Roots in Japanese Verbal Morphology

The basic paradigm of Japanese inflectional morphology consists of roots and tense suffixes. Shibatani (1990) presents the composition of Japanese verbal morphology as in
The inflectional affixes include: **noua** (Conjunctive form, ます-ke), **nomi** (ます-ke), and **noua** (ます-ke), etc. The auxiliaries include: **negative ni**, **desirative ni**, and **past -na**. Among them, the past -na is an affix but is treated on a par with auxiliaries, since it may inflect (e.g., -na-ku (hypothetical)) and attaches to a non-affix form, rather than to a bare root, as mentioned earlier. For the sake of simplicity, we will continue to call it an affix, except when the distinction is relevant, since it is an affix in the sense that it is not an independent word. An example of the 'particle' in (12) is -de, which selects Adverbial forms and may be selected by the auxiliary in, deriving the progressive or resultative as -de-iru. For our current purposes, it suffices to recognize that nomi is an affix attaching to the root, and the complex of the root plus innomi affix is selected by negative auxiliary ni.

As a general introduction to Japanese morphology, we present the inflectional paradigm of affixation to the roots below.

---

<table>
<thead>
<tr>
<th>Verbs (12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root + Inflectional affix (+ Auxiliary) (+ Particle)</td>
</tr>
<tr>
<td>Stem</td>
</tr>
<tr>
<td><strong>noua</strong></td>
</tr>
<tr>
<td><strong>nomi</strong></td>
</tr>
<tr>
<td><strong>noua</strong></td>
</tr>
</tbody>
</table>

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As a general introduction to Japanese morphology, we present the inflectional paradigm of affixation to the roots below.

---

<table>
<thead>
<tr>
<th>Table 3.1: Japanese Inflectional Affirmation Paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verb Class</strong></td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td><strong>noua</strong></td>
</tr>
<tr>
<td><strong>nomi</strong></td>
</tr>
<tr>
<td><strong>noua</strong></td>
</tr>
<tr>
<td><strong>noua</strong></td>
</tr>
<tr>
<td><strong>noua</strong></td>
</tr>
<tr>
<td><strong>noua</strong></td>
</tr>
</tbody>
</table>

The two verb classes, conversational and vocalic, were introduced in Chapter 2, and we will shortly elaborate the classification.

It should be noted that there is a subcategorization relation between an auxiliary or a particle and an inflectional affix, in the scheme in (12). Just as negative ni selects nomi, other auxiliaries and particles select their own inflectional affixes. The subcategorization of selected items is summarized in the table below.

---

<table>
<thead>
<tr>
<th>Table 3.2: Subcategorization of Auxiliaries and Particles according to the Selection of Inflectional Affixes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Innomi</strong></td>
</tr>
<tr>
<td><strong>Adverbial</strong>:</td>
</tr>
<tr>
<td><strong>Conversational</strong>:</td>
</tr>
<tr>
<td><strong>Hypothetical</strong>:</td>
</tr>
</tbody>
</table>

---

Given the subcategorizational relation, it is morpho-syntactically well-motivated to treat these forms as heads taking complements.

Now, we will review the root-oriented classification, conversational vs. vocalic (cf. block (146)), introduced in Chapter 2, focusing on negative and finite tense forms. This classification will play a crucial role in comparing the Parameter Mismatching analysis and the Morphological Mismatching analysis of internal Negation.

Verbs are classified as conversational when the root ends with a conversant. The paradigm of the conversational verbs is exemplified in (13).

---

<table>
<thead>
<tr>
<th>Table 3.3: Inflectional Paradigm of Conversational Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inflectional Paradigm of Conversational Verbs</strong></td>
</tr>
<tr>
<td><strong>noua</strong></td>
</tr>
<tr>
<td><strong>nomi</strong></td>
</tr>
<tr>
<td><strong>noua</strong></td>
</tr>
</tbody>
</table>

---

This class takes -te as a nonpast affix, which may be underlyingly -te- accompanied by deletion of -de- after a conversant. Negatives in this class is derived by having the finite negative predicate in the right of the Innomi form derived from a root plus an affix -te-. The past is derived by attaching the affix -te- to the Adverbial form, which, with conversational verbs, triggers several phonological changes, known as ornd (forced emptyhood). The sound changes may be observed in the paradigm in (13): the sound preceding -te differentiates the past forms from others. The past affix gets voiced when root ends with a nasal, as in non-de. We will discuss the phonological changes in the past forms of this class when we come to the acquisition data.

Verbs of the other class, vocalic verbs, have roots ending with a vowel. The paradigm is in (14). It takes -te as a nonpast affix and -te as a past affix. There is no phonological change in forming the past in this class. A negative form of this class is derived by directly combining a root and a negative predicate, since the template form of a vocalic verb is phonologically equal to the root.

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<table>
<thead>
<tr>
<th>Table 3.4: Inflectional Paradigm of Vocalic Verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inflectional Paradigm of Vocalic Verbs</strong></td>
</tr>
<tr>
<td><strong>noua</strong></td>
</tr>
<tr>
<td><strong>nomi</strong></td>
</tr>
<tr>
<td><strong>noua</strong></td>
</tr>
</tbody>
</table>

---

In addition, there are two auxiliary constructions which appear in early child Japanese and hence require consideration in the examination of negative types. Both of these are vocalic verbs. One is an auxiliary construction with -te- in, which translates roughly as a progressive and can be combinable with unaccusative verbs (cf. takusan). The -te in construction is classified as a vocalic verb here. This makes sense because it consists of non-finite verbs ending with -te and an auxiliary in, which is a vocalic verb itself. The paradigm is in (15).
There are irregular verbs that are 'do' and have 'cause'. They cannot be classified into the conceptual/verbal dictionary because of the irregularity of their inflections. Since we exclude them from our examination of children's negation, we do not introduce them here.

3.2.3. Root-Oriented Asymmetry in Children's External Negation

Given this dichotomous classification of verbs based on the root-final sound, an asymmetry emerges in children's use of External Negation with the consonantal and the vocalic roots. On the basis of this asymmetry, we will argue for the Morphological Maturation analysis over the Parameter Monitoring analysis.

3.2.3.1. Methodology

First, we need to make a methodological remark. The transcriptions used for the examination are of the three children who produced External Negation frequently, among those four introduced in Chapter 2. The properties of occurrence of External Negation was calculated for the consonantal verbs and the vocalic verbs, respectively, in accordance with the classification we have made. Two things are different from earlier counts in Table 2.2 in Chapter 2. First, auxiliary contractions, -ne and -ne-m are now included. These contractions were excluded from counts in Chapter 2, where we focused on the negation of main verbs only, because our purpose there was simply to confirm the existence of a large enough proportion of External Negation to warrant serious consideration. However, now, it is necessary to examine the predictions of the analyses of External Negation under comparison with these auxiliary constructions, as well as with main verbs. In particular, if ne is in the Outer NEG outside of IP, as in the Parameter Monitoring analysis, then External Negation should occur with -ne and -ne-m also, as well as with finite verbs without auxiliaries. Second, irregular verbs are excluded because the consonantal/verbal classification does not apply to them.16

Therefore, we will examine the negation of both lexical verbs and the auxiliary constructions, classifying them into consonantal and vocalic depending on whether the root preceding -ne ends with a consonant or a vowel.

3.2.3.2. Data

A striking result of our study is that consonantal verbs and vocalic verbs strongly differ with respect to the proportion of External Negation. In the period in which children frequently produce External Negation (i.e., as often as Internal Negation) with consonantal verbs, Internal Negation is exceedingly rare with vocalic verbs. This is shown in Table 3.3.

16 The numbers of irregular verbs in negation are quite small for each child and they are almost all Internal Negation only: Toshi (1 Internal), Ken (8 Internal, 1 External), Masanori (3 Internal).

| Table 3.3: Negation Types in Child Japanese divided into the two Root Classes |
|-----------------------------|-------------------|-------------------|-------------------|
| Verb Classes and Types of Negation |                    | Consonantal | Vocalic |
| Child (age)                  | External | Internal | External | Internal |
| Toshi (2;3-2;5)              | 26 (72%) | 10       | 6 (18%) | 25       |
| Ken (2;8-2;10)               | 30 (35%) | 25       | 4 (7%)  | 33       |
| Masanori (2;4)               | 6 (25%)  | 5        | 2 (8%)  | 34       |
| Total                       | 62 (61%) | 40       | 6 (58%) | 112      |

For each child, the consonantal verbs and the vocalic verbs exhibit a very significant difference with respect to the negation types by the Chi-square test: for all three children (Toshi, $x^2=28.56$, $p<.001$; Ken, $x^2=27.70$, $p<.001$; Masanori, $x^2=11.06$, $p<.001$) and for the total ($x^2=26.89$, $p<.001$). A further analysis based on verb-types, not tokens as in Table 3.3, is given in the Appendix of this chapter.

3.2.3.3. Analysis

We have seen that, when children's negation is classified depending on the types of root (i.e., consonantal or vocalic), the proportions of External Negation is significantly different between the two classes. Hence, External Negation has turned out to be very sensitive to the root-final sound of negated verbs, that is, whether it is a consonant or a vowel. No other interpretation of the data seems to be possible.

Let us now compare the two competing analyses for child negation.
Morphological and Morphological Maturation, based on the asymmetry we have found. Recall, first of all, that there are two NEG positions under the Parameter Mismatching analysis. The illustrations of the two patterns are reproduced below.

(10) PARAMETER MISMATCHING ANALYSIS

a. External Negation

```
  VP  NEG
   |   |
  Root Traf
   (+finite)
```

b. Internal Negation

```
  NEG IP
   |
  Root (+finite)
```

The Outer NEG must occur with External Negation only and the Inner NEG must occur with Internal Negation only, as we discussed earlier. Otherwise, root inflection would be overgeneralized in affirmative clauses: if the Outer NEG, the clause-externally applied negative marker, is allowed to co-occur with inflected verbs, then the inflection form in the main verb in each clause, and hence it should be generally possible to have the inflected forms as main verbs, whether the clause is negative or affirmative. However, the absence of root inflection in affirmative clauses was firmly established earlier (cf. section 2.2.2.3).

Notice that External Negation is made possible solely on the basis of the existence of the Outer NEG under the Parameter Mismatching analysis, and hence the sensitivity to the root-class, contextual versus vocalic, is totally unexpected. Since the Outer NEG is an adjoined element, verbs negated by the Outer NEG are not in a selectional relation with it at all. Therefore, the morphological sensitivity of negative types cannot be explained under the Parameter Mismatching analysis. What it predicts is that the properties of External Negation should be invariable to the root-class, that is, not significantly different between contextual verbs and vocalic verbs, contrary to fact.

We will argue that the Morphological Maturation analysis, which presumes that children simply fail to use the correct verbal form under certain conditions, explains the asymmetry of External Negation between the two verb classes (cf. (11) for illustration of the negation structures under this analysis). Why do children make considerably more errors when selecting the inflected of contextual verbs, thereby giving rise to External Negation, while they seldom make the error of inflected forms with vocalic verbs? We will answer this question by showing that inflected formation is morphologically more complex with contextual verbs than with vocalic verbs, and by claiming that there is a reminiscence of the morphological operations involved with contextual inflection formation.

Inflected formation is more complex with contextual verbs than with vocalic verbs

in two respects. First, it is plausible that the isolation of roots, which is necessary for deriving the inflected form, is relatively more difficult for contextual verbs than for vocalic verbs. This is because there are some historical sound change rules known as ambig (sound expanse) in Japanese phonology, which trigger various phonological changes in forming the past forms of contextual verbs. When the root part and the past form of contextual verbs are compared in (13), we see that there are phonological alterations in the final sound of the root, because of the sound change, namely gemination, velar-vocalization, and nasal-aspirationⅣ respectively.

(13) Inflection Paradigms of Contextual Verbs:

```

Inflected Paradigms of Vocalic Verbs:

<table>
<thead>
<tr>
<th>inflected</th>
<th>root</th>
<th>past</th>
<th>root seg</th>
</tr>
</thead>
<tbody>
<tr>
<td>'beef'</td>
<td>bai-i</td>
<td>bai-i</td>
<td>bai-i</td>
</tr>
<tr>
<td>'sleep'</td>
<td>in-i</td>
<td>in-i</td>
<td>in-i</td>
</tr>
<tr>
<td>'wash'</td>
<td>na-i</td>
<td>na-i</td>
<td>na-i</td>
</tr>
<tr>
<td>'take off'</td>
<td>ike-i</td>
<td>ike-i</td>
<td>ike-i</td>
</tr>
</tbody>
</table>
```

In contrast, the underlying form of the nonpast/past pair of vocalic verbs is transparently equal to the root, as we can observe with examples in (14).

Ⅳ In traditional Japanese grammar, the whole process which ends up with /h/ in the non-final position is called hikaz-avoid all together, and refers to this as nasal-aspiration. This includes place-aspiration of nasal in the case of the verb /-i/ in the past, and another case such as the following. The past of the verb ka-in a 'fly' is ka-ud. Here, another alternation is involved before place-aspiration. /N/ in the form is required to avoid a nasal nasal cod, and then /N/ becomes /h/ by place-aspiration. Incidentally, the voicing in the past affix (ni- > ni-h) follows nasal-aspiration.

Thus, for the class of vocalic verbs, it is easy to form the inflected given pairs of nonpast and past forms, while for the contextual verbs, even when the nonpast/past alternation is acquired, it does not automatically follow that the root is identified, because it must be reassigned from evolving the sound expanse (cf. section 2.2.1.2 for the derivation of past forms). In other words, because Japanese phonology prohibits codas consonants except for /h/ in the syllable structure (cf. J. Ino (1986)), it is not possible at the phonological level, to simply extract the bare root of contextual verbs by taking out the nonpast affix from nonpast forms. Therefore, there is a principled relative complexity in root identification, and consequently in inflected formation, with contextual verbs as compared with vocalic verbs.

The other relative complexity in inflected formation is the identification of the particular morpheme for inflected. For the contextual verbs, a particular morpheme, -s, must be identified as the inflected affix attaching to roots, while for the vocalic verbs, the inflected form consists of the root only, that is, without any overt morpheme. Thus, in forming the inflected of vocalic verbs, nothing additional is necessary beyond identifying the root, because the inflected form is identical to the root, while with contextual verbs, the production of a root itself is not possible, because the roots of contextual verbs

90

91

92
violate the requirement of Japanese phonology that onsets must be null except for /t/ and hence produce the roots shown results in phonologically illicit forms. Thus, for consonantal verbs, the irrealis affix -e must be acquired, that is, the affix -e must be learned to be associated with the irrealis (or, negative) meaning. This means that children must differentiate this affix from other non-final affixes such as -i for Adverbials, for example.

Given that irrealis formation is relatively more complex with consonantal verbs than with vocalic verbs, the asymmetry of negation-types across the two classes of verbs in Table 3.3 can be plausibly accounted for under the Morphological Maturation analysis. According to this analysis, negated verbs are always selected to be irrealis by NEG, which is consistently an adult-like auxiliary in Japanese acquisition. Hence, it is expected that the negation with the correct irrealis form, namely Internal Negation, is found more often with vocalic verbs than with consonantal verbs, for which irrealis formation is relatively more difficult. Ultimately, the explanation has to involve a maturational claim, as in (17).

(17) Irrealis formation of consonantal verbs means.

This maturation may be further traced to the maturation of consonantal root identification, which is partly morphological, or the association of an overt morpheme /t/ and the irrealis concept, which is both morphological and semantic. Since it may include both of them, we state the claim as in (17).

In this way, the Morphological Maturation analysis can explain the morphophonology-based asymmetry because it posits that the optimality of External Negation hinges on the form of Irrealis itself, rather than on the position of NEG.

To sum up so far, we have discussed three analyses of External Negation, the Root Inflation analysis, the Parameter Maturing analysis, and the Morphological Maturation analysis. The Root Inflation analysis was rejected because of the lack of root inflections (in particular root irrealis) in Japanese affirmative clauses. By examining the relation between children's negation types (Internal or External) and the type of negated verbs classified by roots (consonantal or vocalic), a strong sensitivity of External Negation to the consonantal-vocalic distinction was observed. The morpho-phonological-based sensitivity is unexpected under the Parameter Maturing analysis, according to which NEG does not select negated verbs in External Negation. In this way, we argued for the Morphological Maturation analysis. We conclude that the cause of External Negation is the delay in the acquisition of consonantal forms, in other words, the maturation of consonantal irrealis formation.12 Below, we will address further issues arising from our analysis.

3.3. The Substitution of Nonpast for Irrealis

In this section, we discuss issues related to our claim that the nonpast forms in External Negation are non-final Irrealis, despite their appearance. First, we will address conceptual issues: whether the claim denies the developmental confluence of functional projections, and whether it runs into the Subtest Problem (cf. Berwick (1983)). Second, we will consider an empirical point related to the claim: why are almost no past forms in External Negation. We will offer some speculations on this point, and argue that the facts are harder to handle with other analyses. In discussing the empirical issues, children's misanalysis: we argue that it is the maturation of consonantal irrealis formation and Hyams suggests that it is the missanalysis of NEG element. Her proposal can explain the lack of past NEG inflections in Internal Negation, which we will discuss in section 3.4.1.

It seems that the misanalysis of AUX as non-AUX affix is too strong because the past AUX affix -e would be misanalysed in the same way given that the inflected forms of -er, such as -er-e, are not found at early stages. If both -er and not are non-AUX-affixes, wrong past forms such as being in 'personile' are expected to occur in a parallel way with the external Negation errors, but such overgeneralisation is unattractive.

There are other analyses in unpublished works. Brooks (1991) argues that External Negation involves the replacement of the NEG element in the ModP head which is projected as the highest head of a clause, whereas it must be placed in NEG, which is lower than TP, assuming a classical structure VtAUX/NEG/TP/P-O1/VP-MP-SMP. This (1995) analyses External Negation as involving the Weak feature in T, whereas I have the Strong feature in adult Japanese (cf. Cheyne (1993) for Strong/Weak feature). Both of these appear to be preliminary in that they simply account for the existence of External Negation without making any other observations. To mention a few empirical questions, their analysis predicts the free occurrence of past verbs in External Negation, which is very unlikely according to our data (cf. section 3.3.3), and they do not account for the asymmetry between consonantal and vocalic verbs.

In this way, we will reexamine the Bi-clausal analysis, which we left out earlier.

3.3.1. The Substitution of Nonpast for Irrealis: Conceptual Issues

Our conclusion leads to the claim that finite forms in children's External Negation are non-final Irrealis in terms of their structural status, despite its appearance. Some conceptual questions arise regarding this point.

First, what is the implication of this claim for the theory of acquisition of inflections? Note that the claim does not mean that children lack knowledge of inflections, as in the Growing Strength view discussed in Wexler (1994). On the contrary, it means that children do have the knowledge of Irrealis inflection, because children are able to choose the correct Irrealis form on almost every occasion with vocalic verbs. The wrong choice of nonpast form, instead of the Irrealis, with consonantal verbs should be interpreted to occur only as a last resort: children know that the negated verbs must be Irrealis, attempt to produce the correct Irrealis form as much as possible, but they end up producing the nonpast form when they cannot form Irrealis as a result of the immaturity of their morphology (cf. 17). Since it is claimed in our analysis that children could have learned that negated verbs must be Irrealis, their knowledge of Irrealis inflection is innate and continuous; it is not learned. Thus, the analysis takes the Strong OG view argued for in Wexler (1994).

Second, the claim that both the nonpast form and the Irrealis form may serve as Irrealis in negation in child Japanese does not run into the Subtest Problem. When the
child grammar (Gc) consists of the adult grammar (Ga) and some incorrect child grammar (Gc), the adult grammar is the subset of the child grammar, and in general, the shift from the superset to the subset cannot be triggered by positive evidence. Any input to children arising from Ga is consistent with Gc, because Gc includes Ga, as well as Gc. Thus, it is not possible to eliminate Gc from Gc based on the input coming from Gc. This is called the Subset Problem (cf. Bowick, 1983, Wester and Matuszalik, 1997, see Anglada, 1978) for the mathematical formulation. However, as we have just seen, the optionality in our analysis is in the lexicon, in the sense that two forms in the lexicon may correspond to Ismials in morpho-system, and the negated verb is always selected by NEG as Ismials in morpho-system. There is no developmental change in syntactic structures of negation in our analysis, hence the Subset Problem does not arise.

3.3.2. The Substitution of Neznap for Ismialic Empirical Issues

Next we discuss why neznap forms, but partly past forms, are chosen as the substitutes for Ismialic. The claim we made is that children cannot produce the Ismialic form of conversational verbs because of the irregularity of their morphology. This does not imply by itself that the neznap forms should be chosen as substitutes for such cases (i.e., in Externat Negation). However, empirically, Externat Negation almost always occurs with neznap forms, as shown in the table below.

Table 3.5: Neznap/past forms in Affirmative Sentences at the stage of Externat Negation

<table>
<thead>
<tr>
<th>Child age</th>
<th>Neznap -p past -a</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2-2.5</td>
<td>888</td>
</tr>
<tr>
<td>2-2.5-3.5</td>
<td>111</td>
</tr>
<tr>
<td>3-4.5-5.5</td>
<td>128</td>
</tr>
</tbody>
</table>

This is in contrast to the situation with European child languages, in which the past forms are missing at early stages (cf. Brown, 1973 and Giuffre and Noonan, 1982) for English, Greenfield (1994) for Catalan and Spanish, and Poppel and Wesler (1993) for German). Given the early acquisition of past forms in Japanese affirmative sentences, more account is necessary for the lack of past verbs co-occurring with Externat Negation.

One speculation we can make is as follows. The past is completed and hence semantically reality, not Ismialic. According to our analysis, Japanese children know that the verb is selected by NEG in negation. If what is selected is indeed semantically reality, as analyzed by traditional Japanese grammar, then the absence of past forms follows from our analysis: children know that the negated verbs are semantically reality in Japanese and hence do not use the past, which is real, under negation.

The other speculation we can make is morphological. Recall that the past affix -a is morphologically an auxiliary, which takes a root inflected as Adverbial, while the neznap affix -p is an affix directly attaching to a root, and so is the Ismialic affix (cf. (19) for adnominal illustration of the difference). This means that, morphologically, the past form (i.e., past affix + auxiliary) has a different status from the Ismialic form (i.e., root + affix), while the neznap form and the Ismialic form have an equal status (i.e., both being root + affix only). The absence of past forms in Externat Negation may follow from the morphological difference between past and Ismialic forms, assuming the developmental continuity of the morphological hierarchy (i.e., an affix is always an affix and an auxiliary is always an auxiliary, in language development). That is, children may substitute neznap for Ismialic, because they have the same morphological status, but do not substitute past for Ismialic, because they have a different morphological status.

Let us now turn to what the lack of past forms in Externat Negation implies for other analyses. The absence of past forms goes against the analysis of Externat Negation with the Outer NEG in general. Recall that the Root Infinitive analysis postulates the Outer Negation for all negation of children's utterances and the Parameter Setting analysis postulates the Outer Negation for children's Externat Negation. Therefore, Externat Negation is projected as in (18).

![Diagram](18)

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Since the Tense affix in (18) is finite, as in affirmative clauses, nothing in the structure blocks the occurrence of past forms in External Negation. Given the fact that past forms are productive in affirmative clauses at the same stage, the near absence of past forms in External Negation raises a question for these analyses which treat the past form as an optional, not the substitute of negation, in External Negation.

The same applies to the Bi-clausal structure analysis, illustrated in (6b), repeated below.

![Diagram of Bi-clausal Structure Analysis](image)

We did not consider this in detail, pointing out that bi-clausal negation in adult Japanese is semantically different from non-clausal negation (cf. section 3.1.2). Here we can add a few more arguments against the bi-clausal analysis. First, since the tense affix of negated verbs is finite, not the substitute of negation, as seen in (6b), the absence of past forms in External Negation is unexpected under the Bi-clausal analysis, as with the other analyses which include the Outer NEG. Second, the asymmetry of External Negation, between existential verbs and verbal verbs, is also unexpected under the bi-clausal analysis, because NEG, though a finite auxiliary, does not select finite verbs in the Bi-clausal analysis. Rather, the two clauses are independent and are simply combined without subcategorization.

3.4. The Continuity of Finiteless of NEG in Japanese Acquisition

In this section, we discuss issues related to another claim of our analysis, that is, the claim that NEG is finite in External Negation, as well as in Internal Negation. First, the absence of the past form nuhaku may be arguably unexpected on our analysis. If NEG is always finite, why don't we find any past forms? Some account is necessary for this fact. Second, though the claim is the opposite of what is observed superficially, it allows us to capture a general property of External Negation and most infinitives, namely, an auxiliary element is in always finite in language development.

3.4.1. The absence of Past NEG

According to our Morphological Maturation analysis, NEG nuhaku is an adult-like finite auxiliary even in External Negation. An apparent problem for this conclusion is the virtual non-existence of past forms of NEG at the stage of External Negation. If the NEG is finite, why don't we find the past form nuhaku, as well as the past tense form of not? Empirically, the past form nuhaku is very rarely found at the stage of External Negation, as shown in Table 3.6.

| Table 3.6: Occurrence of the past form of negation at the stage of External Negation |
|----------------------------------|----------------------------------|
| Child (age) | Occurrence of nuhaku (past of not) |
| Total (2-3-20) | 0 |
| Ken (2-3-20) | 1 |
| MacMurdo (2-4) | 1 |

The search was done through the corpora of four children during the period of External Negation. Only two examples of nuhaku are found. They are:

(19) a. also da na-hako na nuhaku ga ippai wa i-te wa-ni no, ka 2-3-9 (Ken 2-3)
   "I didn't eat (it)?"
   "No, I didn't eat (it)?"

b. ma-ku no hako na ro? no-te wa-ni no, ka 2-3-9 (MacMurdo 2-4)
   "There was not (a bag)?"

In these examples, it is not very clear that the negative predicate is indeed the past of the finite tense. The intended meaning of (19a) is not clear from the context. (19b) has a subtractive morpheme -ka. Overall, even without discerning these two examples, there seems to be no clear indication of production of the past form of the negative predicate.

However, this is not a real problem for our analysis. Notice that the past form nuhaku is missing both from Internal Negation, as well as from External Negation: it is virtually non-existent anywhere in the relevant corpora. Hence, the lack of past negation must be due to some independent factor. If the absence of nuhaku is taken to indicate that NEG is not finite (or non-verbal like English not), then it must also be claimed that NEG is non-finite or non-verbal in Internal Negation, as well, given the lack of nuhaku in Internal Negation. This position is untenable, because it would overgenerate most infinitives (more precisely, non-finiteness is affirmative clauses, as discussed earlier).

Therefore, the absence of past negation should not be interpreted to mean that NEG is not a finite auxiliary. The position we maintain is that NEG is continuously finite in child Japanese, but the past forms do not emerge early for some independent reason.

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Note that Japanese has two ways to negate some propositions of past, as exemplified below.

(1) wa-ni wo gurakku o tabe te i-te wa-ni no, ka 1
   I had a meal at noon (ADr) CURR be-nom (-P)
   "I have not eaten a meal."

(2) wa-ni wo gurakku o tabe re-kot-ta 1
   had a meal at noon (DR) CURR (-P)
   "I did eat a meal."

Compared with those in European languages, (1) corresponds to (generated) perfect, while (2) corresponds to preterite, which refers to past with no reference to present. It is only (2) that involves the past of NEG, nuhaku, in Japanese, and it is perhaps generally true that the preterite is acquired later than the non-past-perf and (cf. Asano and Müller 1976), that is, prompt perfect. Therefore, the lack of the past NEG is not so unexpected under the analysis with NEG as finite in child Japanese.

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3.4.2. Continuous AUX-Placement (CAP)

Our assumption that a\textsuperscript{1} is finite in adult Japanese is consistent with European child languages, with respect to the generalization that auxiliaries are always finite, which we call Continuous AUX-Placement (CAP).

There is a further generalization with respect to root infinitives in European child languages, which was not discussed in Chapter 2. Auxiliaries and modal verbs always occur in finite form and in the correct position in adult languages, even during the root infinitive stage (cf. Bickel (1990), Rizzi (1994) and Waske (1994)). That is, examples such as those in (20) are not found in children’s trancriptions.

(20)  
\begin{itemize}
  \item a. *\textit{apres} manger \textit{to have eaten}  (French) 
  \item b. *\textit{the worm} \textit{to have come}  (French) 
  \item c. *\textit{geheu haben} \textit{to have}  (German)  
\end{itemize}

By collapsing auxiliaries (e.g., have, do) and modal verbs (e.g., can, may, ‘must’) as ‘AUX-elements’, we refer to this phenomenon as ‘Continuous AUX-Placement (CAP)’.

Thus, there is consistency in the placement of AUX-elements from child languages to adult languages, in other words, no maturation is involved in AUX-placement. For the sake of being explicit in discussion, we define the CAP as follows:

(21)  
\textbf{Continuous AUX-Placement (CAP)}

The AUX-element, namely, a verbal element which may cooccur with another verbal element in lower projections in the same clause, are placed into the finite position of root clauses consistently throughout language development.

The observation concerning the finiteness of AUX-elements is based on deShazer (1987) for Dutch, Fettmeier (1994) for French, Poor (2001), Bauer et al. (1992), Poppell and Waske (1994) and Chintef et al. (1994) for German.\textsuperscript{12} In the V2 languages, Dutch and German, the AUX-elements are found to be in the finite form and placed in the V2 position of root clauses, at the stage of root infinitives. In French, again at the root infinitive stage, the AUX-elements are in the finite form (and placed before jaw as negated). This phenomenon is very robust in that there are few (or even no) exceptions reported, and hence it should reflect deep linguistic properties. The origin of the phenomenon will be discussed at the end of Chapter 4.

Under the analysis that a\textsuperscript{1} is finite, we preserve the generality of CAP with child Japanese. Recall that a\textsuperscript{1} is a verbal element and it may cooccur with non-finite forms.

\textsuperscript{12} In deShazer and Flett (1994), the null subject in child English is argued to be PRO, the null subject of infinitives (cf. also Bower and Rothfelder (1995) and Bower and Waske (1995)). There, it is posited not that the null subjects in child English arc much rarer with auxiliaries and modal than with lexical verbs. That is, the analysis implies that child English conforms to the CAP with respect to the phenomena of null subjects.

Table 3.5: Negation Types in the Negation of Auxiliaries in child Japanese

<table>
<thead>
<tr>
<th>Negation Types in the Negation of AUX</th>
<th>External</th>
<th>Internal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child (age)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenri (2:3-3:5)</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Kaa (2:5-2:9)</td>
<td>(1) (1.1%)</td>
<td>13</td>
</tr>
<tr>
<td>Musashino (2:4)</td>
<td>(1) (1.4%)</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>(2) (1.8%)</td>
<td>53</td>
</tr>
</tbody>
</table>

The two cases of External Negation are likely to be accidental speech errors because the same errors occur as Internal Negation in other contexts.

The extreme rarity of AUX-elements under External Negation may receive a principled account if both a\textsuperscript{1} and negated AUX-elements (i.e., -\textit{er} to and -\textit{is} if-a) are correctly identified as AUX’s by children and CAP holds in adult Japanese, as we claim.

That is, according to CAP, AUX-elements are different from non-AUX lexical verbs: the former is constantly finite when the latter may alternate between finite and non-finite forms. Thus, it is expected that finite forms of AUX-elements do not substitute for non-finite forms, even when the substitution occurs with verbal forms. If a\textsuperscript{1} is finite itself and selects a non-finite projection in External Negation, as in our analysis, the AUX-element, which is always finite in root clauses by CAP, cannot occur in External Negation. Other accounts which have afforded NSG for External Negation do not predict the asymmetry between AUX-elements and lexical verbs.\textsuperscript{20}

Therefore, although the parallel treatment of External Negation and Root Infinitives was rejected at the beginning of our analysis, it has eventually turned out that the two phenomena share a general principle in language acquisition, CAP, if our analysis is correct.

\textsuperscript{20} It may be possible that the AUX/external V asymmetry is just a release of the concordal/verbal asymmetry, since the AUX-elements under consideration are vocative. At this point, we do not have arguments or evidence to evaluate this possibility. The lack of AUX-elements in External Negation appears very robust, compared to the increase of vocative verb in External Negation, which has some exceptions. Thus, it seems reasonable to take the AUX/external V asymmetry, which is theoretically motivated, as independent unless some evidence to the contrary is found. This is a point for further consideration.
3.5. Summary of Chapter 3

To conclude this chapter, we have argued that External Negation in child Japanese stems from the immaturity of morphology. In section 3.1, we argued that External Negation cannot be equated with Root Inversion in European child languages because it would overgenerate root inversions in child Japanese, contrary to fact. In section 3.3, we pointed out that the negation type (External vs. Internal) is significantly sensitive to the root of the negated verb (consonantal vs. vocalic). We further argued that the root-based asymmetry indicates that the source of External Negation is the immaturity of formation, not the position of NEG. In section 3.3, we discussed the fact that the form of verbs in External Negation is heavily restricted to aspecpt forms and speculated that this may be due to the semantic or morphological difference between aspect and past.

In section 3.4, we discussed the lack of past NEG adverbials in External Negation and argued that it must be caused by an independent factor because the same holds for Internal Negation at the same early stage. Thus, the lack of past NEG is not a problem for analyzing NEG as finite in External Negation. Moreover, our analysis suggests that External Negation and Root Inversion share a general principle that AUX-elements are continuously finite throughout the development.

Appendix to Chapter 3:

One important result of our analysis is the correlation between verb-classes (consonantal vs. vocalic) and negation types (External vs. Internal) in child Japanese, which is shown in Table 3.3. In this appendix, we add another statistical analysis on this result.

The numbers in Table 3.3 are too small, not types, following the convention of statistical analyses of correlations between finiteness and verb-placement in early child language (cf. section 2.1.2). When some cell in the table includes a very limited number of types, it may be a problem for running a statistical analysis with the numbers of tokens, because the result might not represent a general aspect of children's grammar.

For example, if all instances of Internal Negation of vocalic verbs consisted of i, or only, it would be too restricted for considering the generality of negation in general. However, each cell in Table 3.3 includes several types of verbs. Hence, we can claim that our result is as valid as usual statistical correlation in theoretical studies of language acquisition, such as those in section 2.1.2.

Still, it may be useful to attempt to run another analysis by verb-type, not by tokens of verbs. One thing that has to be handled for this purpose is the case in which one verb appears both in External and Internal Negation. To deal with this case, we classify each verb type into the following three categories: External, Internal, and Ambiguous.

(22)

<table>
<thead>
<tr>
<th>Type</th>
<th>C/E</th>
<th>C/I</th>
<th>C/A</th>
<th>V/E</th>
<th>V/I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subj</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>Ø</td>
<td>Ø</td>
</tr>
<tr>
<td>3rd</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>Ø</td>
<td>Ø</td>
</tr>
</tbody>
</table>

Based on these criteria, we classified verb-types in External and Internal Negations for each child. The results are given below. (C: Consonantal; V: Vocalic)

(23)

<table>
<thead>
<tr>
<th>Type</th>
<th>C/E</th>
<th>C/I</th>
<th>C/A</th>
<th>V/E</th>
<th>V/I</th>
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<tr>
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<td>4</td>
<td>0</td>
<td>4</td>
<td>Ø</td>
<td>Ø</td>
</tr>
</tbody>
</table>

(24)

Mosakii's verb-types in negation classified by the standards:

<table>
<thead>
<tr>
<th>Type</th>
<th>C/E</th>
<th>C/I</th>
<th>C/A</th>
<th>V/E</th>
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</tr>
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</tr>
<tr>
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<td>4</td>
<td>0</td>
<td>4</td>
<td>Ø</td>
<td>Ø</td>
</tr>
</tbody>
</table>

With these outcomes, we formed tables for each child and the total numbers, and executed the Chi-square test to see the correlation, as demonstrated below.

Table 3.3: Correlation between verb classes (Consonantal vs. Vocalic) and Negation Types classified for each verb-type

(C consonantal; V: vocalic; for definitions of E, I and A, see (22) above.)

<table>
<thead>
<tr>
<th>Type</th>
<th>C/E</th>
<th>C/I</th>
<th>C/A</th>
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<td>Ø</td>
<td>Ø</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>E</th>
<th>C</th>
<th>V</th>
<th>2</th>
<th>4</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subj</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>8</td>
<td>0.65</td>
</tr>
<tr>
<td>3rd</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>3</td>
<td>8</td>
<td>0.65</td>
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<tr>
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<td>4</td>
<td>0</td>
<td>4</td>
<td>Ø</td>
<td>Ø</td>
</tr>
</tbody>
</table>
of a purely universal property.

Given this, we will argue that the RI phenomenon is due to the delay of lexical acquisition, in other words, the immaturity of a non-universal morphological property.

For the purpose of explaining RIs, we will propose that inflectional affixes can be divided into two classes, head affixes and adjusted affixes, depending on morphosyntactic properties, that is, whether an affix heads a projection or adjoins to another projection. The adjusted affix, in RI languages, works in the way outlined in Chevray (1993): it is adjacent to V and undergoes checking against features in I by mixing together with the V. The head affix, in non-RI languages, works in the way outlined in Chevray (1993): they project as the head of I and V and adjoins to the affix in I. Based on this morphological distinction, we will derive the typology of RIs in child languages, as well as the typology of the pre-deep phenomena (cf. Chevray 1981), Nyamen (1986a) in adult languages.

As for the RI phenomenon, in particular, we will argue for a Morphological Maturation account. We will propose that adjunction-affixation results at some point in development and that the features in I are unspecified before this maturation, which causes the I-features to activate at a specification of contrastive values. The unspecified I allows RIs, as well as root finite verbs.

By assuming that the head/adjunct distinction of affixation continuously holds throughout development, we will explain the lack of RIs in head-affix languages on general grounds. One principle of acquisition emerging from this account is the continuous placement of head affixes in I, the finite position, in root classes. We will discuss the similarity of this to the CAP of Chapter 3.

4.1. A Typology of Root Infinitives

As we discussed in Chapter 2, child Japanese differs from the European child languages reviewed in Winter (1994), namely non-pre-deep European languages, with respect to the RI phenomenon; in contrast to the latter, virtually no root non-finite verbs are found in the former. This is made evident by comparing the frequencies of root infinitives in non-pre-deep European languages to Table 2.1 of Chapter 2, repeated below for convenience, with the virtual non-occurrence of RIs in Japanese, discussed in section 2.2.2.2 and summarized in Table 4.1 down below.

<table>
<thead>
<tr>
<th>Language</th>
<th>Child Name</th>
<th>Age</th>
<th>% of RIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>French</td>
<td>Mathilde</td>
<td>1-7</td>
<td>2-11</td>
</tr>
<tr>
<td>(Strom-Perl 1992)</td>
<td>1-7</td>
<td>.60</td>
<td></td>
</tr>
<tr>
<td>German</td>
<td>S</td>
<td>1-10</td>
<td>.61</td>
</tr>
<tr>
<td>(Willemsen 1990)</td>
<td>1-11</td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td>(Strom-Perl 1992)</td>
<td>1-12</td>
<td>.53</td>
<td></td>
</tr>
<tr>
<td>Dutch</td>
<td>Laura</td>
<td>1-8</td>
<td>2-3</td>
</tr>
<tr>
<td>(Wierderscheid 1989)</td>
<td>1-8</td>
<td>.36</td>
<td></td>
</tr>
<tr>
<td>Turkish</td>
<td>Tohale</td>
<td>1-10</td>
<td>1-11</td>
</tr>
<tr>
<td>Fedra</td>
<td>1-10</td>
<td>2-1</td>
<td>.26</td>
</tr>
</tbody>
</table>
Among the three forms, Adverbial, Infixal, and Conjunctive, the Adverbial is the closest to the infinitive in European languages, but we call all these "infinitives" for convenience, since they are non-finite and cannot appear in the root class (cf. section 2.2.2.1 for examples and descriptions). The frequency of each form in each child's data is not high enough to be called productive, even ignoring the fact that actual examples of root -e by Mestres are followed by self-corrections. For the non-finite status of these forms in adult Japanese and discussions of these frequencies, see section 2.2.2. Then, it seems clear that Japanese does not have root infinitives parallel to the root infinitive phenomenon in the European languages. 2

The contrast between Japanese and the other languages, which exhibit root infinitives, can be placed into a more general picture by including pro-drop type European languages. As noted and discussed in Cristofaro (1994), Guasti (1994), Riall (1994) and Sato and Hyams (1994), root infinitives are not productive in the early child languages of Italian, Spanish and Catalan. Thus, even European child languages are divided into two groups: non-pro-drop child languages display root infinitives (cf. Table 2.1), while pro-drop child languages do not, as shown in Table 4.2, which is adapted and revised from Sato and Hyams (1994).

3 The age ranges are relatively higher for the Japanese children, but these data come from the very early stage when the children started to speak. These children happened to be slow in language development. In any case, the lack of root infinitives in child Japanese seems to hold generally, irrespective of the rate of development, judging from the observation of other published corpora such as Nipi (1976-77) (cf. Morikawa (1985) for its computerized file) and Kohchi (Kokugo Kenkyuho (1987)).

The cross-linguistic variation immediately suggests that the RI phenomenon is not driven only by maturation of SG principles. If RI's occurred purely due to the immaturity of some universal aspect of grammar, it should occur uniformly cross-linguistically. The variation indicates that language particular factors are involved in the RI phenomenon. Below, we will construct a theoretical analysis of RI's, in a way which accounts for the typology.

### TABLE 5.2: Frequency of root infinitives in pro-drop European Languages

<table>
<thead>
<tr>
<th>Language</th>
<th>Child Name</th>
<th>Age</th>
<th>% of RI's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italian</td>
<td>Elsa</td>
<td>2:9</td>
<td>0.0</td>
</tr>
<tr>
<td>(Guasti</td>
<td>Maria</td>
<td>1:8</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:11</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2:1</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2:0</td>
<td>0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:2</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:5</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:2</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:5</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:2</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1:5</td>
<td>0.05</td>
</tr>
<tr>
<td>Spanish</td>
<td>Daria</td>
<td>2:6</td>
<td>0.09</td>
</tr>
<tr>
<td>(Ortizou</td>
<td>Juana</td>
<td>1:2</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>Antonella</td>
<td>1:5</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>Caterina</td>
<td>2:0</td>
<td>0.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Age</th>
<th>% of RI's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>2:6</td>
<td>0.09</td>
</tr>
<tr>
<td>(Teixeira)</td>
<td>1:5</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>1:2</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>2:0</td>
<td>0.01</td>
</tr>
</tbody>
</table>

In this way, considering pro-drop and non-pro-drop European languages and Japanese together, we have the following two types:

1. **productive RI**: non-pro-drop European languages (e.g., Dutch, German; French; Swedish; English)
2. **non-productive RI**: pro-drop European languages (e.g., Italian, Spanish, Catalan; Japanese)

We will attempt to explain this typological variation in what follows.

---

2 The age ranges are relatively higher for the Japanese children, but these data come from the very early stage when the children started to speak. These children happened to be slow in language development. In any case, the lack of root infinitives in child Japanese seems to hold generally, irrespective of the rate of development, judging from the observation of other published corpora such as Nipi (1976-77) (cf. Morikawa (1985) for its computerized file) and Kohchi (Kokugo Kenkyuho (1987)).

3 See Gribasinsky (1984) for the same typology of breakdown of inferential affixation, which is reflected in the later studies in language acquisition under discussion.
to be meaningful, especially since morphology is the natural basis of parametric variation, though it has not been clear how this morphological difference is thematically connected to the typological variation discussed by these authors. Below, we will try to develop the basic idea expressed in their works, keeping in mind the goal of explaining the RI phenomenon together with the pre-drop phenomenon.

4.2.1. Affixed Ablatives

Let us start by observing the morphological properties of inflectional ablative in each type of language. We will focus on finite ablative, T and AGR, since they are the ones which play a role in the RI phenomenon. In the non-pro-drop European languages, which display the RI phenomenon in language acquisition, there is generally a phonetically null realization in the inflectional paradigm of tense and agreement.

G. a. Dutch 'werk'
inflsive = werk-on, Root = werk, Impervative = werk

<table>
<thead>
<tr>
<th>Tense</th>
<th>Inflective</th>
<th>Root</th>
<th>Impervative</th>
</tr>
</thead>
<tbody>
<tr>
<td>pres.</td>
<td>1.s, 2.s, 3.s</td>
<td>werk</td>
<td>werk-on</td>
</tr>
<tr>
<td>post</td>
<td>1.s, 2.s, 3.s</td>
<td>werk-on</td>
<td>werk</td>
</tr>
</tbody>
</table>

Hynnén (1986b, 1992b), each languages have a [-] value for her "Stem Parameter", which distinguishes languages by whether a verbal stem (=root) constitutes a well-formed word or not.

Another non-pro-drop European language, Swedish (more generally, the Mainland Scandinavian languages), should be grouped together with those in (G), since it also shows the RI phenomenon in acquisition and is a non-pro-drop language. For Swedish, however, the treatment in terms of Morphological-Uniformity or the Stem Parameter cannot be straightforwardly extended. In modern Swedish, there is no preassemblage agreement. The contrast between accusative and past tense is expressed by the affixes -a(k)th(au)- and -a(k). The tense-inflectional paradigms of that of the Swedish with classes are illustrated below, concentrating on cases minimally necessary for us.

(3) Swedish

Class I "fall"
inflsive = falla, Root = falla, Impervative = falla

<table>
<thead>
<tr>
<th>Tense</th>
<th>Inflective</th>
<th>Root</th>
<th>Impervative</th>
</tr>
</thead>
<tbody>
<tr>
<td>acc.</td>
<td>past</td>
<td>falla</td>
<td>falla</td>
</tr>
<tr>
<td>gen.</td>
<td>past</td>
<td>falla</td>
<td>falla</td>
</tr>
</tbody>
</table>

Class II "beer"
inflsive = blik, Root = blisk, Impervative = blisk

<table>
<thead>
<tr>
<th>Tense</th>
<th>Inflective</th>
<th>Root</th>
<th>Impervative</th>
</tr>
</thead>
<tbody>
<tr>
<td>acc.</td>
<td>past</td>
<td>blisk</td>
<td>blisk</td>
</tr>
<tr>
<td>gen.</td>
<td>past</td>
<td>blisk</td>
<td>blisk</td>
</tr>
</tbody>
</table>

Class III "swell"
inflsive = bo, Root = bo, Impervative = bo

<table>
<thead>
<tr>
<th>Tense</th>
<th>Inflective</th>
<th>Root</th>
<th>Impervative</th>
</tr>
</thead>
<tbody>
<tr>
<td>acc.</td>
<td>past</td>
<td>bo</td>
<td>bo</td>
</tr>
<tr>
<td>gen.</td>
<td>past</td>
<td>bo</td>
<td>bo</td>
</tr>
</tbody>
</table>

(Innsbruck (1966, p. 120-127, p. 141))

In the tense paradigm of nonpins/pins, there is no null affix in Swedish. Thus, if we look at the tense paradigm only, Swedish is Morphologically-Uniform, and it is [•-bare stem], which means that there is no null affix in the tense paradigm.

Therefore, we need to rethink how to characterize the morphological property which distinguishes non-pro-drop languages, namely RI languages, from the others. Moreover, we would like to make a theoretical connection between the morphological differences and the typological variation, with respect to the pre-drop phenomenon, development of inflectional affixes, as well as the RI phenomenon. Similarly, we would like to classify Swedish with other RI languages.

The intuition behind Morphological Uniformity and the Stem Parameter seems to be the following: in a language in which the emission of an affix results in a well-formed word, the affixes in this language are of less significance than those of languages in which the affixes cannot be emitted without resulting in an ill-formed word; hence, affixes in the former case cannot license null subjects and they are subject to late development, in contrast to the latter. (Below we will present a speculative account of the licensing mechanism of null subjects).

What needs to be clarified is what counts as a well-formed word. If the criterion is purely phonological, it does not matter if the result of the emission is a noun or a proposition or even a non-existing hypothetical word, as long as the result is

* Interestingly, Modern Spoken Swedish is said to be lacking -de for the past of Class I verbs and having a past form identical to the infinitive or imperative, namely -de. However, such a null realization of the past tense form does not apply to Class II and Class III.
phonologically well-formed. This does not seem to be the case. For example, Japanese tense affixes attach to phonologically well-formed stems in some cases (e.g., -de to the compound verbs) with /t/-final root, stress is 'de', or -te-and -o to the vocalic verbs, not /ai/ or /e/; recall that Japanese syllables must end either with /i/ or /o/ with vowels), but they do not differ from other affixes with more which are ill-formed by themselves. Taking this into consideration, we should redefine what counts as a "well-formed word" in the concept of "well-formed word after omission" in the affix-based typology.

We propose to redefine the parametric variation of theoretical structures in morphology. To be specific, we transition this into terms in which V and I count as heads in affixation (cf. Chomsky (1993)). We will first discuss the adjacent affix; the head affix will be discussed in the next subsection.

In the classical structures with adjacent finite inflectional affixes, the affixes are adjacent to V and they are checked by raising the V, together with the affix, to I, which is the projection of the T/AGR features, out of affixation. Then, for the affixation of adjacent affixes, we follow the system in Chomsky (1993), in which a verb projects together with its affixes, and V-to-I raising is for feature-checking. See (4) for illustration.

We avoid projecting null (adjacent) affixes, and rather license the checking of phonologically null affixes in paradigms where V's, in other words, V's without non-matching affixes. Instead, we propose that the checking is bi-unique: features in I must be checked by appropriate verbs, with and without affixes depending on the feature values, and the affixes must also be checked against matching I-features. Then, for example, "John walks" in English is ruled out because the features in I are specified as [+ past, 3rd person, singular] but the verb does not have the corresponding I-features. However, "he walks" in English is ruled out because the features in the affix are specified as [-past, 3rd person, singular] but the features in I do not have the corresponding specification (i.e., 1st person instead of 3rd). In contrast to the usual conversion in the checking system, this system does not have null affixation of feature values without overt realizations. Nothing is lost at the descriptive level, and it could even be conceptually advantageous, because there are no null projections, which are redundant for descriptive purposes. At any rate, this bi-unique checking and lack of null affixation serve as the basis for our claims regarding affix typology.

Now, the definition of the adjacent affix is essentially the same as adjacent XP phrases in the usual way. If an element (i.e., X or XP) composes with a projection YP) and results in the recession of the same element, YP), then it is adjacent, as illustrated in (5).

There are two intrinsic properties of adjacent interest to us: (1) the projection to which adjoinment applies must be independently well-formed, and (2) the projection created by adjoinment must be the same as the projection to which adjoinment occurs. We will call this latter property "Matching Requirement of Adjunction (MRA)" for convenience. Property (1) corresponds to the spirit of earlier proposals, Morphological-Uniformity and the Lexicon Parameters. We will argue that property (2) usually takes care of the preconditions of the earlier proposals, namely, how to incorporate Swedish and Japanese into the system. To be concrete, since adjoinment of inflectional affixes must not change the thematic status of the whole projection from the category of the pre-adjoinement structure, an inflected affix cannot be adjoined when the root is well-formed as a projection disjoint from the whole projection after affixation. In particular, finite affixes cannot be adjoined to non-finite verbs, since it changes the finiteness of the projection after affixation. The fact that the root is a well-formed word is only a necessary condition for an affix to be affixed. The sufficient condition in the root is well-formed as a projection with the same features (except for the feature values of T and AGR in the affix). We will discuss concrete examples shortly.

Given these considerations, no stipulation is necessary for deflecting adjacent affixes. As long as null affixes are considered to be non-existent, as we claim, the status of an adjacent affix follows from the two general properties of adjoinment we have discussed. Bearing this in mind, we state the definition of an adjacent affix as in (6), to make our discussion efficient.
Adjunct Affixes:

An affix is an adjunct affix if it attaches to a verb or to the stem specification for finiteness (not other relevant features).

The condition phrase in (6) is only one particular instance of the MRA, which is applied to the adjunction of inflectional affixes. What it specifically means is the following: a finite affix (i.e., AGF, finite T), of current concern to us, can only attach to a verbal root which is well-formed as the finite form. Thus, even if the root of a verb may be well-formed as a non-finite verb, an affix of the finite paradigm (AGF, finite T) cannot be attached to this root. This is nothing unusual in view of the general property of adjunction, the MRA. Simply, if the whole projection is finite, an affix cannot be attached to a non-finite projection. This point will prove advantageous in explaining the Japanese and Swedish cases, which are difficult for the previous accounts. Since children know the distinction of finiteness from early on at least in the languages we are considering (cf. Chapter 2), and maybe universally, it is reasonable to claim that children offline this distinction in determining the status of affixes.

Now, let us see how our proposed works for the ER languages. When a paradigm has phonetically well-realized, as in the agreement paradigm of no-agent tense in the languages in (7) (i.e., Dutch, German, French, English), the finite affixes straightforwardly meet the requirement of being unattached. For example, Dutch 2nd and 3rd person singular no-agent tense affix -t is an unattached affix, because verbs appear without an overt affix for 1st person singular no-agent tense. In other words, since verbs are finite, as well as weak, t is recognized as an unattached affix.

Since finite affixes cannot attach to non-verbs or non-finite verbs, due to the MRA, Japanese tense affixes are correctly excluded from the category of unattached affixes. For example, the -te-final root of the causative verbs can be a well-formed word, as in -no-renzai in a-te-"da", but it does not make the no-agent -te an unattached affix, because it is not well-formed as a finite verb. Likewise, roots of the vocalic verbs are always well-formed as non-finite Imi/Adversative forms (cf. Table 3.1 in Chapter 3), and again this does not make the tense affix -no and -ne qualify as unattached affixes, because the roots of vocalic verbs are not well-formed as finite verbs (e.g., mi-ru-te-as "suffering", mi-"ne"") non-finite Imi/Adversative.

Now, notice that Swedish tense affixes can be correctly identified as attached affixes, specifically because imperatives are finite verbs (cf. Zhang (1991) and references therein on the syntax of imperatives). As seen in the examples (3), Swedish nonpast/past forms have some affixes (or segments) in addition to imperative forms, in all the three classes. This inclusion of the imperative as the potential base for the adjunction of finite affixes is motivated by verb-placement. In V2 languages, imperatives move in the V2 position. In the case of Swedish, imperative verbs, as well as finite verbs or root clauses, provide V2-like, while non-finite verbs follow it. Moreover, this treatment of Swedish does not wrongly include Japanese in the group of unattached affixes, since Japanese verbal roots do not serve as imperatives.

* I thank Mert Fersson for helping me with the details of Swedish grammar.

4.2.2. Head Affixes

In pro-drop European languages and in Japanese, which do not display the RI phenomenon in language acquisition, the inflectional affixes are not adjoined. In the case of European pro-drop languages, the verbal root never appear as independent words. This is exemplified below for Italian and Spanish.

(7) a. Italian "do"

Infinitive= -are, Root= -ab-, Imperative= -abi-are, -abi-ne
1, 2, s, 3, 1, pl, 2, pl, 3, pl
abi-are, abi-are, abi-ne, -abi-ne, -abi-ne

b. Spanish "speak"

Infinitive= -haber, Root= -hab-, Imperative= -hab-are, -hab-ne
1, 2, s, 3, 1, pl, 2, pl, 3, pl
haber, haber, haber, -haber, -haber, -haber
(*: not well-formed word)

The difference between Italian/Spanish and other European languages can be captured by the previous proposal: the former is Morphologically-Uniform unlike the latter, or the former is -(h)ave verb unlike the latter. Also, the agreement affixes of the no-agent tense in Italian and Spanish in (7) are clearly not adjoined, since the roots are non-well-formed words and hence there is no base for adjunction. Italian and Spanish do not belong to the group of non-pro-drop languages by any of these criteria.

In the case of Japanese, the situation is more complex, because of the class of vocalic verbs. For causative verbs, which constitutes the majority, the root usually does not appear as an independent word, as in Italian or Spanish, since Japanese syllables do not allow roots constituted except for V's. See (8) below for examples. As mentioned earlier in the discussion of adjoined affixes, the -te-final root can be a well-formed word (e.g., - ni of ate-"die"), though such cases can never be well-formed as finite verbs. For vocalic verbs, the root is a well-formed non-finite verb form (e.g., Imi or Adversative), as exemplified in (8b): the root of a vocalic verb, mi-"ne", is not, and it is by itself Adversative or Imi, that is, it is an independent word.
affixes qualify as adjoined affixes.

To sum up so far, we have divided affixes into two types based on their morphosyntactic properties, as defined in (6) and (60). Given the dichotomy, there is a typology of inflectional affixes corresponding to the typology of RI phenomenon, as illustrated in (50).

As evident in the chart above, the head/adjacent distinction of affixes corresponds to the typology of null subjects, too. This may be captured by proposing that the head affix, being a categorial head of I, may license pro in the Spec of IP, while the adjacent affix, being adjacent on V, cannot. Thus, the connection between the null subject and the affix-typology in the theory of Morphologically-Uniformity is implemented within a functional account. This is one consequence of our proposal. The elaboration of a theory to account for other languages or related matters is left for future work.

4.3.3. The Analysis of Root Infinitive

We claim that RI’s are licensed by the underspecification of (inflectional)-features. The underspecification of I is possible only with adjoined inflectional affix: adjoined affixes adjunction to V and undergo checking against 1-features by V-reduplication. Hence features in I need not be fully specified when the acquisition of features in adjoined affixes is not complete. In contrast, head affix projects as I by themselves, leaving no possibility for underspecified 1-features. Thus, the cross-linguistic variation follows from the typology of affixation in the previous section. But there remains another major question: why do children who speak languages with adjoined affixes produce RI’s while adults do not? We propose that the transition from the child RI stage to the adult non-RI stage stems from maturation of adjoined-affixation. Then, we identify the cause of RI’s in Morphological Maturation, as we did for External Negation in Chapter 3. This is the outline of our proposal. Below, we will provide theoretical accounts for the early stage of each type of language.

4.3.1. Adjunctive Affixes, 1-Feature Underspecification, and Root Infinitives

As is evident from the discussion of head/adjacent affixes, it is only the languages with adjoined I-affixes that display the RI phenomenon. As illustrated in (6), repeated below, adjoined affixes adjunction to V, and V hydration move to I, which is a projection of T and AGR features.
In this way, in languages with acquired inflectional affixes, it is a projection of features, not an overt category, and hence it is possible that it is underspecified in child languages. Before children become mature enough to be able to assign affixes obligatorily, the features in T do not obtain argument values. This is the answer to half of the typological question, that is, why RI's are found only in neo-pro-drop European languages. It is because they have acquired inflectional affixes and the T-features are underspecified, in a way compatible with RI's, at the early stage before maturation of adjective-affixation. Below, we will elaborate on the proposal of underspecification and maturation.

As for the child-adult difference with respect to RI's in such acquired-affix languages, we adopt the T-value underspecification of Welser (1994) and extend it by maturation of adjective-affixation. Specifically, we propose underspecification and maturation as in (11).

(11) a. The tense feature in T is underspecified as [+ tense] and the person agreement feature in T is underspecified as [± person].

b. Adjunction of affixes: it is not obligatory at first and becomes obligatory by maturation later in development.

c. Features in T arrive at a non-contrastive specification, [+ tense] and [± person] when the adjunction of affixes matures.

The underspecification of both T and AGR make the RI illicit. Maturation of affix-adjunction and the consequent contrastive specification of either T or AGR make the RI licit. Let us see how these work.

As the initial stage, T is [± tense, ± person], and it is compatible with both infinitive and finite verbs. The [± tense] notation is one implementation of Welser's

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* We do not dispute the number feature [+/- singular], since no empirical observation is reported on whether the acquisition of the number feature correlates with the demise of RI's or not. In this case, the person feature, the conclusion is reported in child German, as we will see.

* We assume that (optionally) affixed affixes, before the maturation of complete adjective-affixation, do not require checking against features in T, because they do not have contrastive features of tense and agreement. Thorough they may have the 1st person feature, for example, it is not the same as the subject's which is contrasted against 1st and 2nd persons. An alternative is to assume that the feature specification is T is optional, fully specified when an affix is adjoined, and null when the affix is not adjoined. To be consistent with our non-optimal underspecification in T, we choose the first option. See section 4.3 on the theoretical counterpart of optional and non-optimal underspecification.

Incidentally, it perhaps generally holds that the maturation of some linguistic capacity results in the maturation of obligatory application of the capacity. In other words, it is usual that some linguistic phenomenon is optional before children become mature enough. In this same, our predictions of maturation of adjective-affixation, from optional to obligatory, is not peculiar.

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T-value underspecification; it is finite tense but it lacks specified values such as [+ past]. Then, [+ tense] is independent from the checking of tense values of an affix on V, hence compatible with both non-finite verbs (i.e., RI's) and finite verbs without tense values (i.e., children's finite forms under the prepared immunity of adjective-affixation). The raising of finite verbs to T is assumed to be triggered by familiarity, which is independent of specific tense-values, hence overt raising of finite verbs in child German, etc., is compatible with the a-underspecification of T (cf. Welser, 1994, p.333). The [+ tense] feature is different from [± tense], which means that T is non-existant. This allows our theory of underspecification to reserve the licensing site for raising of finite verbs.

To compare with Welser (1994), we agree with him that T is underspecified with respect to specific tense values, but we argue that it is adjective-affixation, not the T values, that matures. This explains the cross-linguistic difference in the development of T values, in particular, the difference between acquired affix languages and Japanese, which exhibit the no-past/past distinction from very early on (cf. section 2.2.2.2). If T itself matures, it remains unexplained why Japanese does not exhibit the developmental delay of tense acquisition (cf. also Goldsmith and Noren, 1988, Geissland (1994), on T examination).

One empirical prediction of our proposals for T is that past tense forms are maturing at the RI stage. Due to the valency states of T before maturation of adjective-affixation, it is predicted that children have a command of only the finite form without overt affix of tense specification. In the case of RI languages, this form is the nonpast form, which overt affix exists for nonpast tense, as noted in Hookema and Hays (1995). The empirical data supporting this claim — the late emergence of past forms in the languages with acquired past tense affixes — may be found in the following:


Another aspect of underspecification in (11) is that the person feature, henceforth AGR-feature, is underspecified as [±] in T. This literally means that it does not exist initially. In this respect, our proposal follows H. Children's claim for child German that finiteness exists but agreement does not (cf. Chomsky (1990), Chomsky and Pesetski (1992), Chomsky et al. (1994), etc.). Hence AGR is [±] in T and adeliong-affixation mature.

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Languages with compositional tense, for example Italian and French, are outside the scope of our discussion here. Since tense is not realized by affixes only in these languages, we do not make clear predictions for such cases. For the development of past tense in these languages, see Proctor and Cassini (1992) for Italian and Clark (1985, p. 727) for French.
and AGR obtains contractive values: 1st, 2nd, and 3rd person. Thus, at the early stage before maturation, agreement between the verb and the subject NP is not required, hence RI's are allowed despite the lack of agreement on infinitives.

In the case of the AGR-feature in I, being [I] initially does not have any interpretative outcome, because it only plays the role of modifying the AGR-features in the subject NP and the verb (cf. Chomsky, 1993, p.360). The AGR-features in V and the one in the subject NP should agree, even in the initial stage, but this does not require the existence of the AGR-features in I. The AGR-features in I attract the raising of V with the corresponding AGR-features. Even without them, however, agreement can take place when the subject NP and the finite verb, raised by finitization independently from AGR in I, agree with each other. In this sense, AGR-features are different from the T-features. They may be underspecified as [I] without any consequences at LF.

Given this consideration of AGR in I as a mere mediator, the empirical prediction of the [I]-under_specification of AGR is not the lack of agreement affixes or random use of them. Rather, presupposing that children can handle person agreement from early on, as evidenced in Italian or Spanish acquisition (cf. Gazd, 1994; Frait, 1995), we predict that children at the RI stage can use agreement affixes correctly but only optionally: they have an adult-like distinction of persons and hence do not use wrong affixed forms, but they may not assign the agreement affix because agreement-affixation in optional before maturation (cf. (11b)) is not an AGR feature in I which requires the raising of the correct agreeing form (cf. (1a)). The observation of German acquisition supports this view. It is reported that in early child German, namely at the RI stage, agreement errors are rare with the 1st person singular and the 3rd person singular, though the 2nd person singular form is very rarely used at first (cf. Mills, 1985, p.214-218; Clackson and Prusink, 1992; Clackson et al., 1995). Prunell and Werder (1993, p.8-10). These data indicate that children's knowledge of person agreement is not random and yet agreement affixes may be omitted. Under our account, the omission of AGR affixed affixes as well as the RI is licensed by the [I]-under_specification of AGR, and yet the affixed affix may not be randomly used because it must agree with the AGR-feature of the subject NP when it is mixed together with a verb. In this way, agreement in early child German supports our account.

Next, let us move on to the issue of the shift to the adult-like state, that is, how children cease to produce RI's. RI's become impossible when either the T-feature or the AGR-feature in I is specified with contractive values. This shift concerning the I-feature specification is triggered by the extension of adjunction-affixation (cf. (11c)). This is the maturation of morphological operation, not of [I] principles: at some point in development, children become mature enough to be able to adjudge affixes obligatorily, and before this, adjunction-affixation is optional. When adjunction-affixation becomes obligatory, children do not omit affixed affixes anymore in raising infinites from adults, and consequently they can acquire the contractive values of T/AGR features. Given the contractive values, T and AGR are independent entities in the lexicon, which may project as I in the clause structure. The specified feature values, [+/- past] of T and [+ person] of AGR, require raising of verbs with features of corresponding values.

4.3.2. Head Affixes, no I-Feature Under_specification, and no Root Inflexives

Head affix project as heads and never adjuches to V. Here we diverge from the assumption of Chomsky (1993) that all affixation is done in the lexicon, and affixes are checked by raising to functional heads. We follow the split of Lasnik (1994) and Reinhart (1994), who account for certain parametric variation by claiming that affixes may head I or adjuches to V, depending on their properties. As a result, our system may be viewed as a mixture of the checking system in Chomsky (1993) for head-affix languages and affixation by V-to-I adjuction raising in Chomsky (1993) for head-affix languages.

When the head affix projects as I by itself, underspecification of I-features does not occur. As long as I projects in head-affix languages, it is headed by one of the affixes. The classical projection with a head affix is illustrated below.

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11 It is noted in Sato and Hyams (1994) that null subjects in child English coccur with the past tense affix [-d] to quite an extent. If child English null subjects are PRO and hence the null subject phenomenon is a subcase of the RI phenomenon, as argued there, then this exception may not be compatible with the current analysis of RI's, which is based on T-under_specification, in particular. One speculative compromise is to claim that -ed is an aspect marker in child English, hence non-finite, as proposed in Sato and Hyams (1994), restricting children's misanalysis of this kind only to LP-raising affixes.

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projection of a particular form of verb as its complement, and that it is compatible with
adjuncts of the particularly selected forms only.19 As long as all I-affixes are heads,
no RI's are allowed.

To make this explicit, the lack of I-under-specification with head affixes is not
a stipulation, let us discuss this more in detail. We argue that the projection of a
phonetically null I, the projection of I-features compatible with RI's, does not occur in
head-affix languages, because the "null I" occurs when V needs to be checked by raising
1. The presupposition of this reasoning is that checking occurs only for adjusted
affixes, which is valid. The crucial point for our discussion is whether a head affix
can be adjusted to V by raising. This is impossible under our theoretical assumption that
affixation must occur to an independently well-formed element, because, as a matter of
fact, it never happens in head-affix languages that a bare root occurs as a verb of the
same finiteness specification as affixed verbs. Therefore, it also never happens that the
null I, which checks the affixes adjusted on V, is projected in head-affix languages.
In this way, from our theoretical distinction of head vs. adjusted affixes and the empirical
fact that the roots of head affixes do not appear as independent verbs of the same
finiteness, it follows that no null I, hence no RI, is possible in head-affix languages.10

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19 Emphasizing the structure is (12), the overt raising of V to I in languages with
head affixes is triggered by the Stray Affix Filter in Lambrecht (1981). If V does not raise,
the head affix will be Sidetracked by itself, violating the filter. This makes an empirical
prediction: all head-affix languages have overt V to I-raising.

10 Two more details may be worth distinguishing. First, even if we dare to allow a null
I projection in head-affix languages, for the sake of discussion, it cannot be compatible
with RI's, as long as infinitival affixes are heads. In the case of non-RI languages under
discussion, Italian, Spanish and Japanese, the infinitival affix does not adjust to well-
formed verbs, hence they are heads, except for, possibly, the "null affixes" of the Imperfect
and Adverbial forms of Japanese volitional verbs.

Second, what about the possibility of the other scenario made by children, that is,
removing an adjacent affix as a head? While this may not be excluded on theoretical
grounds, it is not obvious. We suppose that reflexive onto an element is less costly
than projecting two different but, conversely, chidlren try to adjust as much as they
can.

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What lies behind our exploration of the lack of RI's is the continuity of the
projection of the head affix as I. Then, a generalization akin to the CAP discussed in
Chapter 3 emerges from our account of the RI typology, as stand in (13).

(13) Continuous Head Affix Placement (CHAP):
Head affixes continuously project as I.
(Contemporary: Adjunct affixes continuously adjourn to V, cf. fn. 15)

Without this principle, even when head affixes are correctly identified as heads, RI's may
be overgeneralized, because the head affix can in principle project as a head of V, leaving
the I position underspecified and hence compatible with RI's. CHAP is structurally very
close to CAP, Continuous AUX Placement, in that both principles state that a sequence
is the case of CAP, the selection of V by AUX, and in the case of CAP, the selection
of a stem by a head affix) always projects as an I-V sequence (but not V-V).

We will discuss these two developmental generalizations at the end of this chapter.

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4.4. Comparison with Other Accounts

Let us compare our accounts with some previous analyses of the RI phenomenom, namely
Rizzi (1994), Wester (1994), and Hoffwitz and Rijven (1995). It is not easy to
determine which account is better, since details of the phonemes are still unknown.
So, we will focus on the account of the typology of RI's, since that is the main theme
of our proposal.

4.4.1. Wester (1994)

Wester (1994) considers a few possible explanations for the RI phonology. In all
versions, T is underspecified in the sense that it lacks distinctive values, such as [-past]
or [+past]. Our proposal of a-underspecification of T is developed on the basis of this
aspect of Wester's work.

In one proposal, Wester derives the optionality of finite/non-finite forms by
pointing out the following derivational constraint, adapting Chomsky's (1991)
proposal of affixation by V-to-I raising and I-to-V lowering. When T lacks its value,
lowering I-to-V does not require raising back to I afterwards, hence V-to-I raising and
I-to-V lowering are equal in terms of the economy of derivation in Chomsky (1995).
From this, he derives the optionality of RI's by making a further claim that finite forms
are the result of V-to-I raising, as in adult languages, while the infinitival forms are the
result of I-to-V lowering. After the acquisition of T values, lowering requires one more
raising at LF for the interpretation of T-values at LF. Hence it is not chosen when overt
one-step V-to-I raising is available.

In another version, the analysis just outlined is translated into the framework of
Chomsky (1995), which abandons lowering and adopts LF-raising instead. Still, the
case of the optionality is the lack of T values. He claims that most infinitives are finite
forms with a Weak-AGR feature, which occupies V everly and raises to I at LF, while
finite verbs bear a Strong-AGR feature, which everly raises to I. This is possible only
when T lacks its value, he argues.

Wester does not discuss the typological variation of RI's, since there was no
concerns on whether the optional non-injectives were universal or not (cf. fn. 53 of
Wester (1994)). At any rate, the T value development by itself cannot explain the
variation. Our proposal can be seen as an extension of Wester's analysis, which also
accounts for the typological variation.
4.4.2. Riadi (1994)

Riadi (1994) claims that the source of the phenomenon is the raising of an anima in \textit{OCG} which requires root classes to be CP. Below this manner, any pronominal projections, AGR-TP, TP, VP, etc., can be root classes. Root infinitives are identified as one such truncated structure, that is, bare VPs. The system of tense interpretation in child languages is the same as adult languages, but bare VPs do not require tense interpretation, presumably like auxes, and hence are null. The claim that the "Root-CP" axiom matures is less restrictive than proposals which do not invoke the raising of \textit{OCG} principles or auxes, because it cannot explain the developmental correlation of the demise of the \textit{RI} and the acquisition of some functional elements. For example, the acquisition of 2nd person singular agreement in German reported in Chafe et al. (1994) correlates with the demise of RI's, as we discussed earlier, but it remains unexplained by Riadi's account. It may be possible to claim that after the acquisition of AGR, the clause must project up to AGR, though not up CP, and this suffices to exclude RI's. But then, it is puzzling why the same explanation is not adopted for Italian, in which the AGR paradigm is acquired very early and RI's are very rare. Riadi's account of Italian is different, as we will point out directly.

Concerning typological variants, Riadi explains why root infinitives are necessarily rare in Italian acquisition. Adopting Belleri (1990)'s analysis that Italian infinitives raise to AGR-\textit{a}, just like finite verbs, which is based on the distribution of \textit{V} with respect to a negative adverbial element \textit{più}, Riadi derives the lack of root infinitives in Italian by arguing that Italian infinitives raise to AGR-\textit{a} in child languages as well, and that inevitably creates \textit{T} projections. This makes the whole infinitival clause illicit as a root clause, because of his assumption that tense interpretation is developmentally continuous, that is, infinitival tense cannot occur in the root clause.

This account raises two questions. One is how children acquire raising of Italian infinitives to such a high position. Riadi himself offers some speculations on this point (cf. fn. 8 of Riadi (1994)). As he states, raising over \textit{più} is unlikely to serve as the trigger, considering that it is rare in the input data. The other question is how his account may be extended to other root languages, in particular Japanese. Japanese, due to the inability of \textit{yū-}final character, lacks an overt indication of the raised position of \textit{T} verbs. This, in verbs do not exhibit overtly distinct phrasal constituent on 

4.4.3. Hockstra and Hyams (1995)

In Hockstra and Hyams (1995), RI's are argued to be the result of under specification of the Number feature in pronominal projections. It is an optional \textit{θ}-under specification: children know of the existence of Number in classical projections, but they specify it in only one of the optional ways. When it is left unspecified, children produce RI's because the chain from T to CP, which is necessary for tense interpretation under the theory they assume (cf. Goddard and Hockstra (1994)), is broken and the tense variable is interpreted incorrectly. That is, finite forms are required when T is bound by an operator in C and interpreted as a bounded variable, but RI's result if T is left unbound and interpreted incorrectly.

Our first question is why tense cannot be interpreted as a variable when the number specification is missing. If the T-C relation is binding, missing Number in-between should not matter, and if it is movement, it should be possible to skip an unspecified Number node. There are many adult languages without overt verbal number marking, such as Japanese, while root infinitives are not allowed in any adult languages. Therefore, what underlies the licensing of RI's is the optional specification of an existing Number feature. But this may be difficult to maintain with languages with sparse overt marking for number, such as French, which does not have any overt marking for singular forms of the personal tense, as we will see below.

They address the issue of typology by claiming that languages which display RI's have inflectional paradigms which have number specifications only (Dutch, and English, based on Kayne (1993)) or which may be so reanalyzed (German, and French, in a different sense, as we will see shortly) and other languages without RI's have inflectional paradigms which cannot be so reanalyzed. Their proposal is arguably more restrictive in that it restricts under specification to one feature only — number. However, because they allow the possibility of reanalysis for German and French, the theory calls for some additional assumptions. For German, they argue that children at first recognize the 3rd person singular -s as the singular affix, not 3rd person. For French, they argue that children fail to notice personal agreement because they 'avoid plurals'. These assumptions may be reasonable, but they make their account less restrictive.

To be more specific about the potential problem posed by French, the account by Hockstra and Hyams requires that children learning French point a null singular affix, optionally, when they filter out plural by 'avoid plural' when the null singular affix is missing, the RI appears, and when it is definite, finite verbs are chosen. It may be too powerful to point such as optional null element, since its existence cannot be identified in any overt way.

Swedish could pose another problem. Hockstra and Hyams claim that tense may not be under specified, unlike number. This works for Japanese, which exhibits early acquisition of tense and no RI's. However, as they themselves note (cf. fn. 5 in Hockstra and Hyams (1995)), in spite of the fact that Swedish allows RI's, it has overt marking of the rootoard contrast. This is incompatible with the position that tense may not be under specified at all. They speculate that the Swedish rootoard affix may not represent root, given that fact that it does not appear for rootoard -passives. This

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*However, it is interesting that Japanese nonnegative case-marker \textit{ga} can be assigned by non-finite verbs, as well as by finite verbs, as exemplified by the embedded non-finite clauses in section 2.2.2. In this sense, Japanese non-finite verbs may share something structurally common with finite verbs, depending on the theory of non-negative case-assignment (cf. fn.17 of Chapter 2 for references). In this way, it would be conceivable to claim that they raise to the same position.*
4.5. Under specification and the Subset Problem: A Theoretical Issue

In this section, we address a theoretical issue related to under specification, that is, the Subset Problem of under specification. As we have discussed, it is necessary to posit some under specification to explain the RI phenomena in certain child languages. Specifically, we argue that I features are under specified as [v tense, Ø person] in all languages with adjusted inflectional affixes.

An alternative theory of under specification, suggested in Bashfield and Myers (1995) for example, is to allow the two options in child languages, that is, the option with complete Ø-under specification and the option with the adult-like full specification. In other words, child languages include their own Ø-under specified grammar and the adult-like grammar. We call this Optional Under specification.

Though Optional Under specification may be able to describe the child languages with RIs and the adult-like fineness distinction, there is a general learnability problem in assuming a developmental shift from optional specifications to obligatory specifications, since the latter is in a subset relation to the former. When two languages are in a subset relation, no positive evidence can trigger a shift from the grammar of the superior language to the grammar of the subset language, because all evidence from the target, the subset language, is compatible with the grammar of the superior (cf. Aslin, 1970; Bresnich, 1985; Wester and Mazurkiewicz, 1987). We call this the Subset Problem.

In contrast, when the features in I are under specified without optionality, as in our proposal or in Wester (1994), the child language is not a subset of the adult language with respect to the property of I. Hence, the Subset Problem does not arise. However, non-optionality creates a difficulty in describing RI's and the adult-like overt V-ming in all languages at the same time. The I features must be under specified for the sake of RI's, while they need to be specified in an adult-like way for the sake of V-ming. Our compromise was the under specification [v T, Ø AGR]. The case in point is the current discussion is [v T]. It is without specific values, such as [+ past] or [− past], and interpreted diachronically, hence it is compatible with RI's. This treatment leads us to take the position that V-ming of finite verbs is not for the sake of checking T-features; otherwise, we would end up with a complexity arbitrary stipulation that both finite and non-finite verbs have T-features as [v T]. Thus, we adopt Wester's position that V-ming is for the sake of finesseness, not for the sake of checking T-features. The burden of such a theory is to clarify the nature of finesseness for finesseness, especially regarding how it is independent from T-values. In the Optional Under specification theory, however, this is tautology, since it assumes T as fully-specified when finite verbs are chosen and

undergo V-ming.10

In this way, there are theoretical difficulties for both approaches to this juncture. It was seen unattractiveness to opt for one of the two approaches based on only these theoretical points. As a matter of fact, the head vs. adjusted dichotomy, the core of our proposal, can be implemented under Optional Under specification as well. These theoretical points are issues for further research.

4.6. CAP and CHAP

As a final remark, we discuss the two generalizations resulting from the analyses in Chapter 3 and Chapter 4. In Chapter 3, we analyzed negation crossing in child Japanese, where we arrived at the conclusion that Japanese NEG not, which is an auxiliary in adult Japanese, is finite throughout development in child Japanese, and we pointed out that this can be unified with the fact that AUX-elements are also continuously finite even at the RI stage. We raised this phenomenon CAP and defined it as below.

Continuous AUX-Placement (CAP):
The AUX-elements, namely, verbal elements which may occur with another non-finite verbal element in the same clause, are placed into the finite position continuously throughout language development.

Recall that CAP holds in root infinitives as well: auxiliaries are always finite even when root infinitives are observed (cf. section 3.4.2).

Also, in this chapter, we proposed that the head inflectional affix always projects as I, in accounting for the typology of the RI phenomenon.

(13) Continuous Head Affix Placement (CHAP):
Head affixes continuously project as I.
(Corollary: Adjunct affixes continuously adjoin to V.)

This is a principle necessary to account for the non-existence of RI's in child head-affix languages. The head status of affixes in such languages was shown to be identifiable by general structural properties of adjusted elements and heads. However, even if the affix projects as a head, it cannot account for the absence of RI's unless it projects as I. Then, CHAP, as well as CAP, is an acquisition-based principle.

These two principles are similar in certain structural respects. First, both of them involve two (or, more than one) separate elements, AUX and the non-finite V, or, the head affix and the V root. Second, the lower element is selected by the higher element, in the sense that the combination of the lower element and the higher element is fixed.

So, we can generalize these two as sequences of two verbal elements which are in selectional tomom. Thus, CHAP and CHAP both indicate that such sequences are...
always projected as I-V, not as V-V-V.18

This is a curious generalization in language acquisition, since syntactic theories based on adult languages are not restricted in such a way. As a matter of fact, given that sequences of three elements, AUX-AUX-V (e.g., (15)), are projected as I-V-V, the sequence of AUX-V (e.g., (16)) is usually considered to project as V-V and then the higher V is raised to I, as illustrated in (17). (Irrelevant details are ignored in the structures below.)

(15) a. John [i, say] [i, have] [i, been] [tensed]. (at Spell-Out)
   b. John [i, had] [i, been] [tensed]. (at Spell-Out)

(16) a. John [p, say] [i, have] [i, been] [tensed]. (Before Spell-Out)
   b. John [i, had] [i, been] [tensed]. (Before Spell-Out; see(15))

Thus, the projection in (17a) is possible in syntactic theories, though it violates CAP. Also, in a French example (18), we can directly observe that the AUX-V sequence avoid eu is projected as V-V, that is, to the right of NESS-pas.

(18) Ne pas avoir eu d’enfants because est une condition pour désirer des enfants.
   'We do not have had a happy child is a prerequisite for willing desires.'
   from Pollock (1989, p.375)

Given the structural similarity between CAP and CHAP, it is plausible to expect that they originate from the same source. If so, some implications emerge. To answer one which has empirical consequences, head auxiliaries are AUX. From this, we may be able to derive some differences between head auxiliaries and adjunct auxiliaries. For example, Japanese tense auxiliaries would be identified as AUX, unlike English tense auxiliaries. This can be the basis for explaining the difference in tense interpretation between Japanese and English, discussed in Ogihara (1989), Swall (1992) and Nakamura (1995).

In these weeks in the fact that Japanese past tense behaves like past perfect in English in the embedded clause, as illustrated in (19).

(19) Hanako ga [Taro ga byotoku de-ta to] to ieru-te na (finite)
    non non sick-be(+P) think(+P)
    'Hanako thought that Taro had been sick.'
    but NOT 'Hanako thought Taro was sick'

The 'simultaneous reading' is not available in (19), which indicates that Japanese data is somehow different from English. Now, if Japanese past tense -ta is AUX, as suggested by the unified treatment of CAP and CHAP, then data is indeed expected to behave like had been, since it should consist of AUX-V. It is interesting in this regard that the Japanese past tense -ta is morphologically AUX (cf. Shimoze (1993)), as discussed in Chapter 3. For example, data consists of the Adverbial form de ar-u and AUX-ta, morphologically. Thus, there is support for the unified treatment of CAP and CHAP in Japanese temporal interpretation and is Japanese morphology.

Here again, as in the final part of Chapter 3, our analyses of two different phenomena of child languages, External Negation and Root Infinitives, meet each other, even though we initially rejected the idea that they were the same. This time, a principle which seems to be necessary to avoid overgenerating RI's in non-RI child languages, CHAP, has turned out to share common properties with CAP, which builds on External Negation and the lack of RI's of AUX-elements, according to our analyses.

It may be possible to deduce CAP and CHAP from more general principles. As we already pointed out, both of them ensure that the highest of the sequence of verbal elements in selectional relations is finite, that is, it projects as I, assuming that the interpretation of finite tense is assigned to the element in I. So, we may unify CAP and CHAP as a principle regulating the projection of sequences of more than one verbal element in selectional relations, which we call a Continuum. Why then is the top element of the Continuum always finite I? We speculate that the Continuum projects in a top-down way: first, the top element projects as I and then lower projections occur downwards. In contrast, two independent elements may project in a bottom-up way: first, the lower element projects as V and then the higher projects as I. With this speculation, the RI of a lexical verb is possible when features in I are underspecified.

The lexical V (with adjuncts affixed) and the underspecified I do not constitute a Continuum because their features are independent, hence they may project in a bottom-up way. However, the RI of AUX-V, a Continuum, is never possible, as long as the Continuum projects from I to V as a top-down way continuously throughout development. Thus, we can unify CAP and CHAP as follows.

(20) Continuum Continuum Projection (CCP):
A Continuum, a sequence of verbal elements in selectional relationships, projects downwards from finite I to a top-down way, continuously throughout language development.19

One consequence of this extension is that infinitival AUX, which is presumed to be in V I (18) at Spell-Out, projects after the projection of infinitival feature in I.20

Now, why does CAP project projections? Observations of child languages, including ours, indicate that a Continuum and a single verbal element project differently. But why do they project top-down? This question may be related to the issue of UIG syntax whether chains formation is attraction (top-down) or movement (bottom-up). Continuums defined here and chains in UIG syntax are the same as the same that both of them involve sequences of elements in some selectional relationship. Under this view, it is interesting that the reinterpretation of movement as attraction is explored in Chemtob (1993).

18 If we assume that it is impossible to add a bottom-up projection to the top-down projections, which may be an instance of cyclicity, then it is not necessary to stipulate that the top-down projection of a Continuum must specifically with finite I, presupposing that all root clauses must be headed by the finite I. When a Continuum in a root clause projects from V in a top-down way, it is necessary to add the finite I to a bottom-up way later in the derivation.

19 To give another perspective for clarification, this essentially means that the infinitival AUX undergoes "lowering" if we put it into the framework of Chemtob (1991).
Thought CAP and CHAP are principles required for the analysis of child languages only, it might be that the robust continuity in acquisition which underlies these principles reflects the nature of phrase structure building by the innate linguistic capacity. The unification of CAP and CHAP in the form of the CCP points toward this possibility, as we speculated above.

4.7. Summary of Chapter 4

In this chapter, we have argued that the cause of the root infinitive (RI) phenomenon is the immutability of morphology, namely, adjectives-affixation, which is specific to the type of affixes (i.e., adjoined affixes) of RI languages, and which makes the features in RI underspecified and compatible with RI's. In section 4.1, we observed that the typological variation of RI's in child languages corresponds to the typology of null subjects in adult languages, and argued that the cross-linguistic variation suggests that the RI does not arise from the maturation of principles or features in UG. In section 4.2, we divided the inflectional affixes into two classes, head affixes and adjoined affixes, depending on morpho-syntactic properties, thus in, whether an affix bears a projection or adjoins to another projection. We developed the idea of earlier works based on the morpho-syntactic form of Japanese and Swedish and theoretical properties of adjectives. The proposed division can theoretically account for the typology of null subjects in adult languages. In section 4.3, based on this morphological distribution, we proposed for adjoined-affix languages that: (i) l-features are underspecified initially as [ε T, 0 AGR], which is compatible with RI's, and (ii) adjectives-affixation undergoes maturation. Consequently, RI's are possible only in adjoined-affix languages, and after maturation of adjectives-affixation, the l-features acquire coreference values, and RI's are disallowed even in adjoined-affix languages. The head-affix cannot be minimally adjoined and thus the typology of RI's was derived, by proposing that head affixes continuously projects as I, not V, by a principle which was named CAP.

In section 4.4, we reviewed other proposals on RI's in Risi (1994), Wexler (1994), and Hanks and Hyams (1995). In section 4.5, we discussed a theoretical issue of underspecification concerning the robust principle and raising of finite verbs. In section 4.6, we made a final remark, speculating on the possibility of enlisting the outcomes of this chapter and Chapter 3, that is, unifying CAP and CHAP.

Throughout this dissertation, we pursued the idea that maturation may occur in the morphological component. To develop this theoretically, it is necessary to restrict the possible options of Morphological Maturation. It is very unlikely that any morphological operation may mature. Perhaps, Morphological Maturation is impossible when it results in the violation of some principles of UG, as Wexler (1989) speculates for restricting syntactic maturation ("UG-Conserved Maturation" in his terminology). We leave concrete discussions of this theoretical issue for future research.

References


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