

UNIVERSITY OF CALIFORNIA

Los Angeles

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

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Linguistics

by

Tetsuya Sano

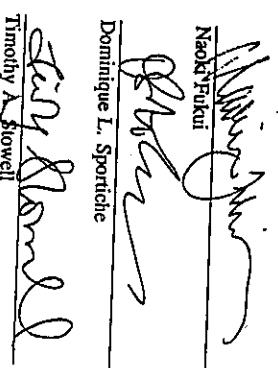
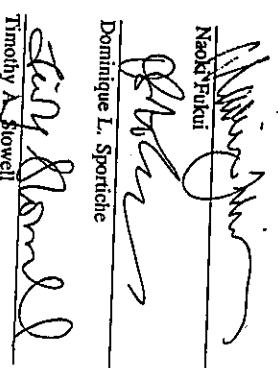
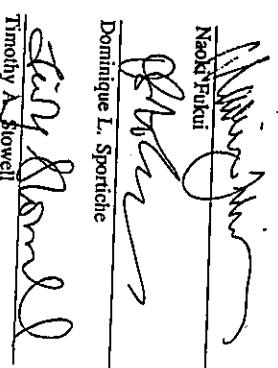
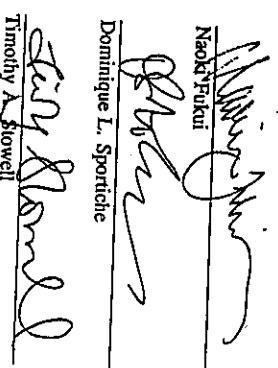
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This dissertation is dedicated to Keiichi Tsumura (1964-1989).


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1995

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ABSTRACT OF THE DISSERTATION

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by

Tetsuya Sano

Doctor of Philosophy in Linguistics

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Professor Nina M. Hyams, Chair

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 differences. By examining the properties of the root (= stem), we argue that these differences are caused by Morphological Maturation and that the clausal structures and principles imposed on them are continuously the same throughout development.

First, children acquiring Japanese optionally attach the negative auxiliary *nai* to the finite (nonpast) forms (i.e., External Negation), while negated verbs must be obligatorily inflected for the non-finite *Irealis* form in adult Japanese. We examine the data of three children, and point out that when External Negation is found at around 60% with consonantal verbs, it is as rare as around 5% with vocalic verbs ($p < .001$ by the

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Chi-square test). Therefore, we argue that External Negation is caused by immaturity in *Irealis* formation of consonantal verbs, which is more complex than that of vocalic verbs, and that External Negation does not deviate from adult negation concerning the clausal structure, finiteness of *nai* (i.e., Japanese NEG), and the non-finiteness of negated verbs.

Second, non-finite verbs optionally appear as main verbs in root clauses in many child languages (i.e., Root Infinitives, cf. Wexler (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 raise to I together with V for feature-checking as in Chomsky (1993), while in pro-drop languages they are heads of I, to which V adjoins as in Chomsky (1991). Under this proposal, Root Infinitives are caused by the immaturity of adjunction-affixation, which allows I 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.

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missing in child English, it was argued that child English lacks functional projections, in Guiroye and Noonan (1988), Lebeaux (1988), and Radford (1990) (cf. Clahsen 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 overtly 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. Weissenborn (1988), Pierce (1992), Poeppel and Wexler (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 contrastive analyses of the continuity/maturation 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 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 phenomena of child languages in terms of the formulas in (2) and (3), repeated below.

(2) $UG(c) + Lexicon(c)$ of Language X = Child Language X
(3) $UG(a) + Lexicon(a)$ of Language X = Adult Language X
(c: child, a: adult) (where X = English, Japanese, etc.)

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 $UG(c)$ is the same as $UG(a)$ with respect to functional projections. Following this assumption, the omission of functional morphemes in (some) child languages should be traced to the differences between $Lexicon(c)$ and $Lexicon(a)$. 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 stage of the acquisition of non-pre-drop languages (e.g., French, Dutch, German, Swedish, English, etc.). As is 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 start 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 constructing 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

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theory seeks to characterize the general nature of the language faculty in the human brain by investigating the nature of the brain-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 Hyams (1986a) for the concept of parameters). If parameters are reinterpreted as variations of functional elements in the lexicon (cf. Borer (1983)), everything learned may be conceived of as being in the lexicon.¹ Hence, the knowledge of language in the human brain can be schematized as in (1).

- (1) $UG + \text{Lexicon of language } X = \text{language } X$
(where $X = \text{English, Japanese, etc.}$)

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 language X have this knowledge of what is possible and impossible in the language X . The

¹ Some problems may be still pending, though. For instance, it is not obvious if "order", such as head-initial and head-final (cf. Stowell (1981)), can be reduced to a property of lexical items (cf. Kayne (1995), Chomsky (1994)). Another opaque case is the apparent variation with respect to the levels at which syntactic operations apply (e.g., move-α at LF or S-structure, cf. Huang (1982), Lasnik and Saito (1984, 1992)). This is a theoretical issue in the Minimalist Program (cf. Chomsky (1993)), which proposes that PF and LF are the only levels of representations.

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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. Wexler and Culicover (1980)), given the observation that children do not accept grammatical corrections (cf. Brown and Hanlon (1970), 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.²

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) $UG(c) + \text{Lexicon}(c) \text{ of Language } X = \text{Child Language } X$
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² This is an argument based on the so-called "poverty of stimulus" (cf. Chomsky 1965, 1986a).

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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 matures, that is, it becomes active by biological maturation at some point in development and it is inactive before then, as advocated in Borer and Wexler (1987, 1992), Felix (1986), etc. Under this hypothesis, UG at the child stage ($UG(c)$ in (2)) is immature and different from UG at the adult stage ($UG(a)$ in (3)). This could 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., $\text{Lexicon}(c) \neq \text{Lexicon}(a)$ in (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.

1.2.1. Previous Studies

After generative syntax developed into the theory of conditions or principles imposed on syntactic operations (cf. Chomsky (1973), (1981)), there emerged studies of acquisition which attempted to inquire into the innate principles in children's grammar.³ In the late 70's 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. Otsu (1981) and papers in Goodluck and Solan (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 these principles, in Chomsky (1981), child languages became an empirical domain for evaluating theories of parameters. A child-adult difference may be conceived of as a difference in parameter settings, and if a set of child-adult differences may follow from different settings of one particular parameter proposed for some 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 (1985a), Jaeggli and Hyams (1988), and the parameter of Governing Categories in Wexler and Manzini (1987); also see other work in Roeper and Williams (1987).

³ There is earlier work which describes children's grammar by phrase structure rules and transformational rules, such as Menyuk (1969), Bloom (1970), Dale (1972), McNeil (1970), etc.

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Since Borer and Wexler (1987), which explored the possibility of explaining developmental delays by maturation of UG, in 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 arises the question 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), Pinker (1984), Hyams (1986a)), which claims that UG constrains child languages continuously throughout development, is more restricted than a position which admits maturation of UG, because the latter, unlike the former, admits the possibility that the human brain forms rules unconstrained 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 overgeneration of ungrammatical sentences excluded by UG principles, as well as being conceptually less restrictive. See Rizzi (1994) for discussions comparing various positions regarding continuity vs. maturation and a particular maturational proposal.

Interesting points have been made on the issue of continuity/maturation of clausal structure. Since Chomsky (1986b), the clausal structure is divided into functional projections such as CP (i.e., complementizer 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

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missing in child English, it was argued that child English lacks functional projections, in Guilfoyle and Noonan (1988), Lebeaux (1988), and Radford (1990) (cf. Clahsen 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 overtly 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. Weissenborn (1988), Pierce (1992), Poeppel and Wexler (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 contrastive analyses of the continuity/maturation of clausal structure in UG.

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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 analyses 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 "maturational" (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 inquiring into some phenomenon in child languages, the child-adult difference truly turns out to be due to some particular aspect of morphological maturation, the rest of the phenomenon under investigation should reflect the continuous aspects of UG. We will argue for such cases in this dissertation. Since the continuous aspects of grammar hold 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.

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1.3. Theoretical Framework

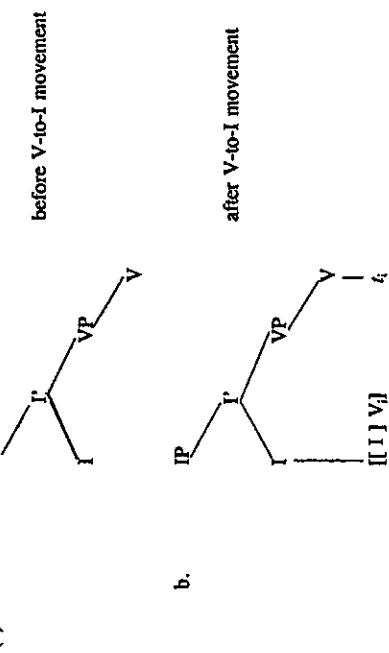
As discussed in the previous section, our study of language acquisition will focus on determining which aspects of child language phenomena mature and which are continuous throughout development. Given that we will explore the possibility that morphological properties may be subject to maturation, our 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 clausal 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 (1994)'s Bare Phrase Structure theory which builds phrase structures by directly combining words (or features) and their projections without projecting unnecessary intermediate projections, which were obligatory in the X-bar schema. We may posit 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 is Spelled-Out, that is, it feeds into PF at some point of the derivation. Thus,

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

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We adopt Chomsky's (1986b) proposal that there are functional projections headed by I(_{fifl}), which selects VP, and C(_{omp}), which selects IP. Clauses are headed by either IP (e.g., English, French, Japanese) or CP (e.g., Dutch, German, Swedish), depending on the language.⁴ Following the spirit of Pollack (1989), Chomsky (1991), and Chomsky (1993), 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 clausal structure of IP is derived in the following way.

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Similar considerations apply to CP-headed clauses. Depending on whether V-movement occurs before or after Spell-Out, the overt position of finite verbs will differ. From this, the typological variation of word order may be derived (cf. Chomsky (1993)). Also, we assume that languages may vary as to their branching directions, for example, the head of the phrase is in the final position of the phrase in Japanese, while it is in the initial position in English.

We will take an eclectic position concerning affixation. We will argue that languages may differ with respect to whether the inflectional affix heads I or adjoins to V in Chapter 4. In languages with head inflectional affixes (e.g., Italian, Japanese), I is headed by the affix and V adjoins to I by movement, as in Chomsky (1991). In languages with adjoined inflectional affixes (e.g., English, French, German), inflectional features (T and AGR) project as I and the V with the adjoined affix moves to I for a concrete discussion.

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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 I, as in Chomsky (1993). We will argue that the dual system is motivated by the typological variations. For the moment, we simply note that the dual system is not internally contradictory as long as the head and the adjunct are distinguished in a principled way. Moreover, we do not call for lowering movement for English affixation, which was the major disadvantage of affixation in Chomsky (1991). English inflectional affixes adjoin to V and undergo checking, as in Chomsky (1993), 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 (irrealis 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 negation in child Japanese.

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14.

In Chapter 4, we will discuss the typology of the phenomenon 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-affixation, 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.

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 verbs). 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 Wexler (1994), and display their frequencies in each language.

In adult languages, infinitives can only appear in embedded clauses. The infinitival tense must be anchored by the finite tense of the matrix clause for its interpretation (cf. Eng (1987), for example). Also, the subject of the infinitival clauses, PRO, must be controlled by the matrix subject, to receive a non-arbitrary 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's) (cf. Rizzi (1994), Wexler (1994)). Wexler (1994) shows that optional root infinitives are found in many European child languages.

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Chapter 2

The Morpho-Syntax of Finiteness in Child Languages: Background

In this chapter, we will compare Japanese and European child languages with respect to the morpho-syntax 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 wrong 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 Irrealis form under negation, while the Irrealis 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 Wexler (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

to the context of AUX+participles in adult languages, rather than in free alternation with declarative finite forms, the root participles are the pure omission 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. Schaeffer (p.c.). In this way, in this dissertation, we treat root participles as something potentially within the scope of the root infinitive issue but not as part of a basis for constructing proposals.

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 Weissenborn (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. Wexler (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 (7a).

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- (6) a. Jean (n')regarde pas la television.
watch(FIN) not the
b. *Jean (n') pas regarde la television.
'John does not watch television.'
- (7) a. Ne pas regarder la television consolide l'esprit critique.
'Not to watch television strengthens one's independence.'
(cf. Pollock (1989))

This phenomenon is captured by assuming that there is a functional projection I(NFL) for finiteness (or Tense) and AGR(eement) as separate projections of I(NFL)), which is projected structurally higher than V, and that finite verbs overtly move to I, while non-finite verbs do not (cf. Emonds (1978), Pollock (1989), Chomsky (1991).¹ The difference between the derivations is illustrated below.

- (8) a. finite clause structure in French (at Spell-Out)
-
- ```

graph TD
 IP --- I
 I --- NEG
 I --- VP
 NEG --- pas
 VP --- regarder

```
- (9) b. infinitival clause structure in French (at Spell-Out)
- 
- ```

graph TD
    IP --- I
    I --- NEG
    I --- VP
    NEG --- pas
    VP --- regarder
    VP --- [inf] infinitival tense feature
    
```

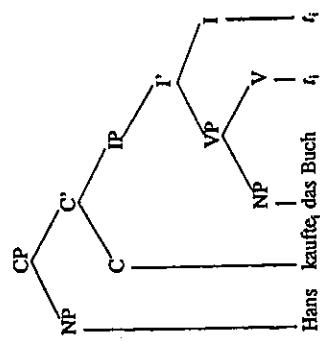
¹ Among non-finite verbs, participles do not move to I, but infinitives are analyzed as undergoing covert movement to I. See Pollock (1989).

- The same kind of result has been obtained for German by Poeppel and Wexler (1993). German is one of the so-called Verb-Second (V2) 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(FIN) that book
b. *Hans das Buch kaufte.
'Hans bought that book.'
- (11) a. Hans müßte das Buch kaufen.
Hans had-to that book bought(INF)
b. *Hans müßte kaufen das Buch.
'Hans had to buy that book'
- This is captured by assuming that there is a functional projection C(OMP), which is projected structurally higher than V, as illustrated in (12) below, and contains the finite tense feature and that finite verbs overtly move to C (via I), while non-finite verbs do not (cf. Koster (1975), which is the classical analysis of this phenomenon, and see Haegeman (1991) for an introduction to the relevant arguments for this analysis and references). The difference between the derivations is illustrated below.

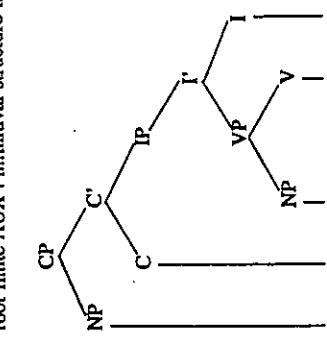
- (9) Child French: Verb placement in negatives as a function of tense
- | | Philippe | Grégoire |
|-------|------------|------------|
| V-Neg | +Finite 52 | -Finite 1 |
| Neg-V | 3 | 4 |
| | V-Neg | +Finite 43 |
| | Neg-V | -Finite 0 |
| | | 0 |
- | | Nathalie | Daniel |
|-------|------------|------------|
| V-Neg | +Finite 68 | -Finite 0 |
| Neg-V | 3 | 82 |
| | V-Neg | +Finite 53 |
| | Neg-V | -Finite 3 |
| | | 36 |
- from Pierce (1992, p.66)

The statistical correlation of the two factors, finiteness and ordering with respect to the negation marker *pas*, is significant at $p < .001$ by the Chi-square test.

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



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



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

Table 13 shows the results of this analysis. The table compares the frequency of V2 and Vfinal placement across different verb-positions. The data shows a significant correlation between finiteness and verb-placement, with children more likely to use V2 for finite verbs and Vfinal for non-finite verbs.

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constituents.²

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

	V2nd	+Finite	-Finite
Vfinal	11	6	37

from Poeppel and Wexler (1993, p. 7)

Here again, the statistical correlation is significant, at $p < .0001$ by the Chi-square test.³

Similar trends in the contingency between finiteness and verb-placement can be observed for other European languages, too, though strict quantitative analysis is not available for them.⁴ See deHaan (1987) and Weverink (1989) for Dutch. For Swedish,

² As pointed out in Poeppel and Wexler (1993), children's sentences with only two words are V2 and Vfinal at the same time, because they are (XP 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 those two-word-long sentences, though, as shown in Table 1 of Poeppel and Wexler (1993).

³ 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 they move to I, which is clause-final, in subordinate clauses. That is, it is possible that children project I, instead of C, in the V2 position of root clauses (cf. Barthier (1993), Clahsen et al. (1994) and references therein), and if so, the children's distinctive verb-placement indicates the existence of only I but 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 verb is. See Meisel and Müller (1992), Poeppel and Wexler (1993), and Clahsen et al. (1994), etc., for issues of functional projections in child German.

⁴ 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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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 (MLU=1.5-2.0, cf. Platzack (1992)), at least. See Hyams (1992a), Platzack (1990, 1992), and Wexler (1994) on data and analyses of child Swedish.

In sum, in acquiring languages with overtly 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

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 obligatoriness of finite verbs in root clauses. We will first introduce the relevant morpho-syntax of adult Japanese and then turn to the children's data.

phenomenon, as Guasti herself shows, and thus 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.

is left unaccounted 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 obligatoriness of finite verbs in root clauses. We will first introduce the relevant morpho-syntax of adult Japanese and then turn to the children'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.

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2.2.1. Negation in Adult Japanese

In adult Japanese, the negative marker *nai* is a verbal predicate and it carries finite tense in itself. In this respect, Japanese *nai* 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 Zanuttini (1991)).⁵

In affirmative sentences, Japanese verbs and adjectives exhibit a paradigm of tense inflection by changing suffixes, as illustrated by examples in (14).

⁵ A further difference is that *nai* may function as an negative existential verbal predicate by itself and it is in complementary distribution with the affirmative existential predicate *ari*. Compare the following pair of examples:

- (i) koppu ga nai
cup nom not(-P)
'there is not a cup'
- (ii) koppu ga aru
cup nom be(-P)
'there is a cup'

Thus, *nai* and *aru* are complementary in the above existential sentences. This is not observed in the European languages which we consider. The source of the difference also lies in whether the negative element is a verbal element or not.

(14)

- a. Taro ga eiga o mi-tu (koto)⁶
nom film acc see(-P)
'Taro sees a film'
- b. Taro ga eiga o mi-ta (koto)
nom film acc see(-+P)
'Taro saw a film'
- c. taiyoo ga akarui
sun nom bright(-P)
'The sun is bright'
- taiyoo ga akarui-kat-ta
sun nom bright(-+P)
'The sun was bright'
- d. taiyoo ga akarui
sun nom bright(-P)
'The sun is bright'
((-P):non-past = present and future?)
((+P):past)

Basically, finite verbs and adjectives are produced by attaching tense affixes to their roots: for verbs, *-tu* is non-past and *-ta* is past; for adjectives, *-i* is non-past and *-kat-ta* is past. The non-past tense affix varies depending on the final sound of roots: for roots

⁶ The phrase *koto* 'fact', which nominalizes the example sentence, is sometimes necessary to make example sentences sound natural, because of the nature of the nominative *ga* which we can leave aside.

⁷ Strictly speaking, this affix *-i* for adjectives is not used for the future, hence it is rather present than non-past. However, we call it non-past to be consistent with the terminology for verbal tense affixes, since this does not affect our discussion here.

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ending with vowels, it is *-nu* (cf. (14a)), and for roots ending with consonants, it is *-u* (cf. (14b)).⁸

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

(15) a. Taro ga eiga o mi na-i (koto)
nom film acc see(IR) not(-P)
'Taro does not see a film'

Taro ga eiga o mi rak-at-ta (koto)
nom film acc see(IR) not(-+P)
'Taro did not see a film'

b. Taro ga heya ni hair-a na-i (koto)
nom room to enter(IR) not(-P)
'Taro does not enter a room/ will not enter a room'

Taro ga heya ni hair-a rak-at-ta (koto)
nom room to enter(IR) not(-+P)
'Taro did not enter a room'

⁸ From the viewpoint of English or other European languages, it may appear peculiar for adjectives to carry tense, but this is because Japanese adjectives contain the copula (or its properties) in themselves, as evidenced by the fact that they do not cooccur with copulas such as *da*. Compare (i) and (ii) below.

(i) Taro ga gakusei da
nom student be(-P)
'Taro is a student'

(ii) taiyoo ga aikai (*da)
sun nom red(-P) be(-P)
'The sun is red'

⁹ It is quite conventional to attach the affix */a/*, which appears in negating verbs with roots ending in consonants, onto the beginning of the negative predicate, rather than to the end of verbal roots, and we follow Shitazani (1990) in adopting the latter option. We postpone discussing this point until we present our analysis of negation in child Japanese. Here, it suffices to observe that tense is not realized on verbs, no matter how the affix */a/* is connected.

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 *nai*.

2.2.1.2. 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 *nai* 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 *nai* (cf. Okubo (1967), Clancy (1985), Ito (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 negation error and the adults' correct form is illustrated by examples in (16) for verbs and (17) for adjectives.

- | | | |
|------|---|---|
| (16) | CHILD ERROR (child name, age)
a. nor-u nai (Manabu, 2;6)
ride(-P) not
'(it) will/doe not ride.' | ADULT FORM
nor-a na-i
ride(IR) not(-P) |
|------|---|---|

(16) illustrates the children's error and the adults' correct form is illustrated by examples in (16)

for verbs and (17) for adjectives.

- | | | |
|----|--|--|
| b. | hair-u nai (Toshi, 2;6)
enter(-P) not
'(it) does not enter.' | hair-a na-i
enter(IR) not(-P) |
| c. | tsuk-u nai (Masanori, 2;4)
attach(-P) not
'(it) does not attach.' | tsuk-a na-i
attach(IR) not(-P) |
| d. | hai-ta nai (Toshi, 2;6)
enter(+P) not
'(it) did not enter.' | hai-a na-kai-a
enter(IR) not(+P) |

((-P)=nonpast, (+P)=past, (IR)=Irrealis; the source of children's data is my corpora unless specified otherwise.)

- | | | |
|------|---|---|
| (17) | CHILD ERROR (child name, age)
a. okki-i nai (Ken, 2;10)
big(-P)not
'(it) is not big.' | ADULT FORM
okki-ku na-i
big(ADV) not(-P) |
| b. | atarashi-i nai (Masanori, 2;6)
new(-P) not
'(it) is not new' | atarashi-ku na-i
new(ADV) not(-P) |

((-P)=nonpast, (+P)=past, (ADV)= Adverbial)

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 a (+P_(ast)) or (-P_(ast)) inflection on the verb or the adjective and *nai* is to the right of the tense-inflected verbs/adjectives. In the adult counterparts, however, verbs and adjectives are inflected with Irrealis or Adverbial (non-finite) affixes 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.

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(18) Negation in Japanese

- CHILD ERROR**
Root(V or A)+Affix(nonpast(?)) Neg(nonpast(?))
=External Negation
- ADULT FORM**
Root(V or A)+Affix(Non-finite) Root(Neg)+Affix(nonpast)
=Internal Negation

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 (10) are based on their superficial forms interpreted in accordance with adult Japanese grammar. It should be also noted that the affix attaching to the root and the negative auxiliary *nai* is almost always a nonpast form in the children's errors. The empirical details of these constructions in child Japanese grammar 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, External 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 forms 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 rethink 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-tu nai
eat(-P) not
'(I will) not eat' | b. deki-ta nai
can+do(+P) not
'(I) couldn't do it' |
| c. | ku-tu nai
come(-P) not
'(xx will) not come' | d. kowa-i nai
scared(-P) not
'(I) am not scared' |
| e. | samu-i nai (2;2)
cold(-P) not
'(it) is not cold' | f. ooki-i nai (2;5)
big(-P) not
'(it) is not big' |

(a.b., from Clancy (1985), c.e.f., from Ito (1990), d. from Okubo (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 uncontroversial methodological points which we take into consideration in treating children's negation data.

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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 Sumihare's data in Noji (1974-77), there are some examples of External Negation. Unlike in other corpora we examine, Sumihare's examples are very often preceded by similar adult utterances, and hence may involve anaphoric negation with repetitions of the previous adult utterance.¹⁰

- | | |
|--|---|
| <p>(20) a. ADULT: sinbun tot-i?
newspaper take-(+P)
'Did you take newspaper?'</p> <p>SUMIHARE: tot-ta na-i (2:1)
take-(+P) not-(−P)</p> <p>b. ADULT: at-ta
be-(+P)
'There it is'</p> <p>SUMIHARE: at-ta na-i (2:2)
be-(+P) not-(−P)</p> <p>c. ADULT: kata-i
hard-(−P)
'(It) is hard'</p> <p>SUMIHARE: kata-i na-i (2:2)
hard-(−P) not-(−P)</p> | <p>d. ADULT: oisi-katta?
delicious-(+P)
'Was (it) delicious?'</p> <p>SUMIHARE: oisi-katta na-i. (2:1)
delicious-(+P) not-(−P)</p> |
|--|---|

¹⁰ My thanks for the example list provided to me by Masao Fukuhara, who went through the corpus of Noji (1974-77) and collected examples of negation, among other things, and for Hiromi Morikawa's computerized files of Noji's transcripts (cf. Morikawa (1989)). Presentation and interpretation of these data are my own.

and state 'I will not come', as in (21a) and (21c), the appropriate verb is *itaz* 'go'. Similarly, the negated verb 'give' in (21b) should be *ageru*, 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., *kuretu* for 'give') or not (e.g., *ageru* for 'give'). Second, the predicates in adult sentences in (21a) and (21c) are polite forms for 'come' which are common as imperatives but not used as non-polite declaratives, in which *kuru* is used for 'come'. Judging from the fact that Sumihare productively uses *kuru* properly at this stage, we judge Sumihare'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 *nai* could be anaphoric. 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-anaphoric sentential negation, 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 uses *nai* in an anaphoric way.¹²

¹¹ Moreover, there are examples of negation of fixed expressions, such as *dooto nai* 'please not', *motto nai* 'more not', *dokkaito nai* "heavy-ho" not' in Sumihare's data, all preceded by adult speech of the target of imitation.

¹² In Sumihare's corpora, Noji (1974-77), External Negation is heavily restricted to anaphoric negation. This may have to do with the fact that the child spoke the Hiroshima dialect and produced negation with -*ai*, as in *ikan* 'I won't go', from very early on. In any case, since we do not treat the anaphoric type of negation, preceded by

In examples of this kind, we do not know for certain if the verbs with tense inflection are really finite or unanalyzed imitations of the previous adult verbs or adjectives. In fact, in the case of Sumihare's data, there are other examples which seem to be interpretable only as copies of adult speech followed by *nai*, as in (21).

<p>(21) a. ADULT: kotti oide 'Come here'</p> <p>SUMIHARE: kotti oide na-i (2:0) not-(−P)</p> <p>b. ADULT: iyoodai 'Give it to me'</p> <p>SUMIHARE: iyoodai na-i (2:1) not-(−P)</p> <p>c. ADULT: irasshai 'Come here'</p> <p>SUMIHARE: irasshai na-i (2:2) not-(−P)</p>
--

There are two reasons to think that these children's negation 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'

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 to 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, not even 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-speakers, most of the time at the child's home. Although we were interested in negative sentences during data collection and made some efforts to elicit them from children, there was no real designed experimentation. Thus, the data are essentially spontaneous speech samples.

target-like adult speech, Sumihare's data are not included in the discussion of negation structure.

In calculating the proportions of External Negation, we tried to eliminate potential cases of imitation of adults' 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 this 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 forms belong to External Negation, and negated lexical verbs of non-finite forms belong to Internal Negation, and the finite/non-finite distinction is based on the usages 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 usages. 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 2.2: Development of Negation Types with Tensed Verbs and Adjectives

Child Name:	Toshi	Neg with Verbs	2;3-2;8	2;9-2;11
		External Negation	26	4
		Internal Negation	24	35
Neg with Adjectives		2;2-2;6	2;7-2;11	
		External Negation	0	0
		Internal Negation	0	8

Child Name:	Ken	Neg with Verbs	2;8-2;10	
		External Negation	34	
		Internal Negation	71	
Neg with Adjectives		2;8-2;10		
		External Negation	7	
		Internal Negation	0	

Child Name:	Masanori	Neg with Verbs	2;4	
		External Negation	7	
		Internal Negation	14	
Neg with Adjectives		2;4		
		External Negation	2*	(= A-root+i+ku+nai)
		Internal Negation	3	

Child Name:	Manabu	Neg with Verbs	2;5-2;9	
		External Negation	3	
		Internal Negation	12	27
Neg with Adjectives		2;5-2;9		
		External Negation	0	
		Internal Negation	2	

Child Name: Manabu	Neg with Verbs	2;5-2;6	2;7-2;9	differs from adult Japanese regarding the finite morphology of the negated verb, stated below.
	External Negation	3	0	
	Internal Negation	12	27	
Neg with Adjectives		2;5-2;9		
	External Negation	0		
	Internal Negation	2		

(22)	Optional External Negation:		
		At an early stage, Japanese-speaking children optionally produce verbs of finite forms in negative clauses.	

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.¹³ 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.

¹³ In particular, Ken produced few intelligible word combinations before 2;8.

Thus, we find that children sometimes produce verbs of finite forms under negation, and otherwise produce correct non-finite *Irealis* 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-pro-drop) European languages. But are there root infinitives in child Japanese? We turn to this issue directly.

2.2.2. 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

between finite forms and non-finite (Irrealis) forms is observed in 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, to investigate whether the optional Root Infinitives in European languages and optional External Negation 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 sound 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. Bloch (1946)). By giving examples of both classes, we will illustrate the inflectional affixation of the following forms: nonpast and past finite tense, and among non-finite tenses, Irrealis, Adverbial, and Conjunctive -te.

As noted in section 2.2.1, a finite verb is either nonpast or past.¹⁴ The nonpast form is derived by attaching an affix -ru/ju to the end of a root: more specifically, the affix is -u for consonantal verbs, as in (23a) and -ru for vocalic verbs, as in (23b). The

¹⁴ Whether the contrast in Japanese finite tense is past/nonpast or perfect/nonperfect could be controversial. However, our purpose here is to observe children's distinction of finiteness. 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.

past form is derived by attaching an affix -ta to the end of the Adverbial form, which will be introduced later. We will discuss the derivation of the past when we discuss the Adverbial form, and here we do not go beyond the simple introduction of the form.

Examples of past forms are in (24).

- | | | |
|------|--------------------------------------|--------------------|
| (23) | a. hair-u
enter-(^{-P}) | 'enter (non-past)' |
| | b. mi-ru
see-(^{-P}) | 'see (non-past)' |
-
- | | | |
|------|---------------------------------------|----------------|
| (24) | a. hair-ta
enter-(^{+P}) | 'enter (past)' |
| | b. mi-ta
see-(^{+P}) | 'see (past)' |

On the morpho-phonological derivations of nonpast affixation, we adopt the deletion analysis in Bloch (1946) and McCawley (1968): the nonpast affix is -ru, and the /r/ deletes when it is attached to the root of consonantal verbs, because it otherwise results in ill-formed geminates. However, this is not very crucial for our current purposes, since we only need to check the distribution of finite and non-finite forms in children's data.

We will consider three 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.¹⁵ In

¹⁵ Other non-finite forms include: Hypothetical (*katei-kei*, e.g., *hair-e* 'enter', *mi-re* 'see'), Imperative (*miirei-kei*, e.g., *hair-e*, 'enter', *mi-nomi-yo* 'see'), etc.

introducing each of their usages below, we will concentrate on those which appear in children's early data. The first is Irrealis (i.e., *mizen-kei*), which appears under the negative predicate *nai*. It consists of a root and an affix /a/ for consonantal verbs (e.g., *hair-a* for *hair-u* 'enter'), and it is equal to bare roots for vocalic verbs (e.g., *mi* for *mi-ru* 'see'). Since we have already discussed this, we simply list two examples.

- | | | |
|------|--|--|
| (25) | a. Taro ga kore ni hair-a
nom this to enter-(IR) not-(^{-P}) | <i>(koto)</i>
'Taro does not enter into this' |
| | b. Taro ga kore o mi na-kata
nom this acc see(IR) not-(^{+P}) | <i>(koto)</i>
'Taro did not see 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., *renyoo-kei*).¹⁶ 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 /i/ for consonantal verbs (e.g., *hair-i* for *hair-u* 'enter'), and it is equal to the root for vocalic verbs (e.g., *mi* for *mi-ru* 'see'). It occurs as the main verb of embedded clauses, in a way similar to the participle constructions in English.

¹⁶ See Ohta (1994) for the general structural properties of *renyoo-kei*.

- | | | |
|------|--|--|
| (26) | a. Taro ga kore ni hair-i, Jiro ga are ni hair-u.
nom this to enter-(ADV) nom that to enter-(^{-P}) | '(While) Taro enters into this, Jiro enters into that' |
| | b. Taro ga kore o mi, Jiro ga are o mi-ta.
nom this acc see(ADV) nom that acc sec-(^{+P}) | '(While) Taro saw this, Jiro saw that' |

As indicated in the translations of each example, the tense of Adverbials depends on the tense of the matrix clause: the Adverbial is interpreted as nonpast in (26a) and past in (26b). Thus, the Adverbial is non-finite.¹⁷ It also occurs in an infinitival-like clause embedded under a desiderative predicate *tai* 'want'.

- | | | |
|------|---|---|
| (27) | a. Taro ga kore ni hair-i tai
nom this to enter-(ADV) want-(^{-P}) | <i>(koto)</i>
'Taro wants to enter this' |
| | b. Taro ga kore o mi ta-kata
nom this acc see(ADV) want-(^{+P}) | <i>(koto)</i>
'Taro wanted to see this' |

The desiderative *tai* is inflectionally adjectival, its past form is *takatte*, as in (27b). The

¹⁷ The Case of the subject of the embedded clauses headed by Adverbials (and the Continuative -te, which will be discussed shortly) is a controversial issue. Since the so-called nominative *ga* is assigned to the subject in the embedded clause headed by Adverbial verbs, as well as in the finite root clause, this poses a problem to the straightforward extension of Case systems of European languages. In Kuroda (1965), Saito (1952), and Fukui (1986), it is argued that Japanese *ga* is assigned by insertion-like mechanism and independent from Tense. See Takezawa (1987) for arguments for Tense-dependent nominative Case in Japanese. See Fukui and Nishiuchi (1993), Miyagawa (1993), Ura (1993), etc. for recent developments of Case theories of Japanese.

tense of the Adverbials is dependent on the tense of the matrix predicate, in a way similar to English infinitives. Both of them bear the tense of 'possible future' (cf. Bresnan (1972), Stowell (1982)) with respect to the tense of the root clause, when embedded under finite predicates such as desideratives.

Recall that the past form is derived by attaching *-ta* to the Adverbial form. Let us now clarify the derivation.¹⁸ This is clear with a verb involving a sibilant-final root, such as (28).

- (28) *kas-i* + *-ta* → *kasita*
lend-(ADV) -(+P) 'lent'

With vocalic verbs only, we cannot directly observe if the root to which *-ta* attaches is Irrealis or Adverbial, since both of them are phonetically equal to the bare roots (e.g., *for miru* 'see', bare root/Irrealis/Adverbial is *mi*, and the past is *mi-ta*). With consonantal verbs with the non-sibilant-final roots, the formation of the past form involves the sound change known as *onbin* (sound euphony): gemination, velar-vocalization, and nasal-assimilation, as in (29).

- (29) a. *hai-i* + *-ta* → *haita*
enter-(ADV) -(+P) 'entered'
b. *kak-i* + *-ta* → *kaita*
write-(ADV) -(+P) 'wrote'

¹⁸ The description of the derivation is based on Shibatani (1990, p.234).

- c. *nond-i* + *-ta* → *nonda*
drink-(ADV) -(+P) 'drank'

Thus, the morphological composition of past formation is not directly observable with consonantal verbs, except for verbs with sibilant-final roots. This is not relevant for the current discussion, but it will be crucial in the analysis of negation in child Japanese in the next chapter.

The third non-finite form we consider is the Conjunctive *-te*. Its derivation is parallel to the derivation of past *-ta*: *-te* attaches to the Adverbial form and there are sound changes (i.e., *onbin* 'sound euphony') with non-sibilant consonantal verbs. This form is often referred to as 'gerundive' in the literature. However, in its distribution, it is more like a participle form. For one thing, it occurs in embedded clauses, carrying non-finite tense dependent on the matrix finite tense, in the same way Adverbials do. Thus, Conjunctives behave in a way analogous to Adverbials in examples such as the following.

- (30) a. Taro ga kore ni hait-e, Jiro ga are ni hair-u.
nom this to enter-(CJ) nom that to enter-(+P)
'(While) Taro enters into this, Jiro enters into that'
b. Taro ga kore o mite, Jiro ga are o mi-ta.
nom this acc see(CJ) nom that acc see-(+P)
'(While) Taro saw this, Jiro saw that'
(CJ: Conjunctive)

The examples in (30) are synonymous with those in (26). Moreover, this non-finite form, root plus *-te*, is participial also in the sense that it cooccurs with auxiliary-type predicates such as *iru* 'be', *aru* 'be', *iku* 'go', and the like, bearing aspectual 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.

- (31) a. Taro ga kore o mi-te i-ru.
nom this acc see-(CJ) be-(+P)
'Taro is seeing this'
b. Taro ga ari-te i-ta.
nom walk-(CJ) be-(+P)
'Taro was walking'

(CJ: Conjunctive)

In the progressive examples above, once again, we see that the finite nonpast/past alternation is realized in the matrix predicate *iru/ita*, hence the *-te* forms themselves are non-finite.

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

(32)	Verbal Inflections (Selected for Research of Finiteness in child data)			
	Vocalic	Verbs	Consonantal	
Finite	nonpast	root- <i>a</i>	root- <i>ru</i>	
non-finite	Irealis	root- <i>Ø</i>	root- <i>a</i>	
	Adverbial	root- <i>Ø</i>	root- <i>i</i>	
	Conjunctive	root- <i>e</i>	root- <i>e</i>	

(Ø: phonetically null)

2.2.2. Child Japanese: No Root Infinitives

The three non-finite forms we have seen, Adverbial, Irealis, 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 not 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 Irealis 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. Irealis under the negative predicate *na!* is often found for all three children. Adverbial under the desiderative predicate *tai* is rarer

compared to that, but is frequent in Ken's and at least existent in the lexicon of the other two children.

Table 2.3: Irrealis and Adverbial cooccurring with finite predicates

Toshi (2;3-2;8)	Ken (2;8-2;10)	Masanori (2;4)
Irrealis+tai	Irrealis+tai	Irrealis+tai
24	71	14
Adverbial+tai	Adverbial+tai	Adverbial+tai
1	34	2

Thus, if the phenomenon of optional root non-finite main verbs is universal, it is expected that the Irrealis and Adverbial forms would be found as root 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 nonpast or past in child Japanese. For all the three children, Adverbial and Irrealis is almost completely nonexistent as main verbs of affirmative Root Clauses.

Table 2.4: Inflection of Main Verbs in Affirmative Root Clauses

Toshi (2;3-2;8)	nonpast -tai	past -ta	Adverbial	Irrealis
	288	84	0	0
Ken (2;8-2;10)	nonpast -(r)tu	past -ta	Adverbial	Irrealis
	111	175	0	1 (0.3%)
Masanori (2;4)	nonpast -(r)tu	past -ta	Adverbial	Irrealis
	138	50	0	0

This contrasts with child European languages which exhibit root infinitives, specifically non-pro-drop 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 -te is also restricted to non-finite contexts. The Conjunctive -te must be accompanied by finite auxiliaries 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 -te

	-te + AUX	Root -te
Toshi (2;5-2;8)	55	1 (1.8%)
Ken (2;8-2;10)	13	0
Masanori (2;4)	22	(3)

The three examples of Masanori are all followed by self-correction with appropriate finite auxiliaries. It seems safe to interpret the data to be indicating that the participle -te is not at all productively used as the main verb of root clauses.¹⁹²⁰

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

¹⁹ Describing her data and reports in other studies, Clancy (1985, section 4.1) suggests that the -te form is overgeneralized to the main verbs 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 natural to have the -te form as the main verb of a non-imperative sentence; it simply sounds like a truncated subordinate sentence. It is not difficult to see whether children's utterances are of this kind or others such as progressive, resultative, or imperative, since the latter group can be quite clearly identified from the context.

²⁰ If the Conjunctive -te form is totally equivalent to the participle 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 -te may combine with an AUX other than *iru* 'be' and have meanings which do not correspond to participles in European languages (e.g., *V-te miru* 'try to V', *V-te iku* 'going to V', etc.). Thus, we consider it together with Irrealis or Adverbial forms.

2.2.3. Generalizations in the Early Morpho-Syntax of Japanese

There are two results of our examinations of the morpho-syntax of child Japanese. On the one hand, the optionality between non-finite Irrealis forms and finite forms in negative clauses suggests that there is something that children do not know about the inflection of finiteness 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 these from language-particular phenomena.

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

Let us see what common properties we can elicit from the comparison of Japanese and European languages. Wexler (1994) points out four generalizations in (33) on the grammatical properties of finiteness in European child languages.

- (33) There is an early stage in which the child:
- (G1) knows the possibility of head (in particular V-) movement²¹
 - (G2) knows that head movement is forced in the finite case²²
 - (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.

As for child Japanese, we find the distinctive treatment of finite and non-finite verbs at an extremely early stage.

²¹ This implies the existence of functional heads in child languages, contra Lebeaux (1988), Radford (1990), etc.

²² See Verrips and Weissenborn (1992) for an observation that children do not raise finite verbs at an extremely early stage.

verbs, which leads to (G1)-(G3), with respect to affirmative clauses. We have seen that only finite forms appear as 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. Even theory-neutrally, 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 verbs follows. So, covert LF 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 disappearance of root non-finite forms is not controlled solely by the maturation of UG principles and

- 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 (I), 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 (G2) and (G3). 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.

that it should involve the acquisition/learning of some language-particular properties, which is ultimately traced to morphological maturation. 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 External Negation phenomenon in child Japanese. This will be the main topic of the next chapter.

that it should involve the acquisition/learning of some language-particular properties, which is ultimately traced to morphological maturation. 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 External 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: Toshi
born on February 15, 1989
came to Los Angeles in March, 1991
observation started April 9, 1991 (1;8)
observation ended June 11, 1992 (2;11)
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 sessions)
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 9, 1991 (1;8)
observation ended December 20, 1993 (2;4)
observation ended June 6, 1994 (2;9)
siblings: 1 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 8, 1989
came to Los Angeles in April, 1992
observation started January 13, 1992 (2;5)
observation ended September 18, 1992 (3;1)
siblings: 1 elder sister (born on August 25, 1989)
native language of parents: both Japanese
language at home: Japanese only
language at nursery school: no attendance at nursery school
- Child Name: Marabu
born on August 8, 1989
came to Los Angeles in September, 1992
observation started December 20, 1993 (2;4)
observation ended June 6, 1994 (2;9)
siblings: 1 younger sister (born in July, 1991)
native language of parents: both Japanese
language at home: Japanese only
language at nursery school: 2-3 times a week, period uncertain

Chapter 3

The Morpho-Syntax of Negation in Child Japanese

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 missetting 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 maturation 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 Corder (1967)).

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 missetting 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 Irrealis form under negation. This delay may be construed as the morphological maturation of the capacity to construct Irrealis forms. Eventually, we will argue for the third analysis after considering the predictions made by each hypothesis with respect to children's data.

3.1. External Negation and Root Infinitives

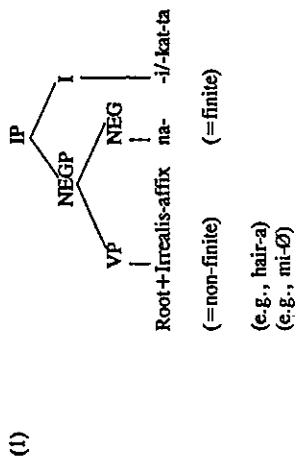
In this section, we will first of all introduce the structure we adopt for negative clauses in adult Japanese. Then, we will postulate two structures for children's External Negation by drawing an analogy with the two patterns proposed for negation in child English. One of the two patterns, the structure 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 (§1). The negative marker is a finite predicate and it raises from NEG to I.¹ 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 us to posit NEG_P as an independent phrase. It suffices to take *na* as an auxiliary on a par with *ar* 'be' or others. Nevertheless, we adopt the label NEG_P, to facilitate comparison with other languages. Second, the projection of phrases and inflectional affixes will be discussed in Chapter 4. There may be various versions, for example the following three and their combination: i) the phrases and affixes project separately which is followed by affixation by movement (cf. Chomsky (1991)), or ii) they are amalgamated in the lexicon and the features are checked by movement (cf. Chomsky (1993)), or iii) they merge by some other means (cf. Marantz (1984), Halle and Marantz (1993), Lasnik (1994)). The structures 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 discussions in Chapter 3.

non-finite Irrealis.



negation in this way (e.g., Sakuma (1936)). The inflectional system in Shibatani (1990), which we adopt, refines this tradition. On the other view, NEG is *-anai* and it attaches to verbal roots directly, with the phonological deletion of /a/ when it follows a vowel (i.e., with vocalic roots). This account has been adopted by certain American structural linguistics (e.g., Bloch (1946)), as well as in early generative phonology (cf. McCawley (1968)). Note that even under the first view it is not impossible to adopt the deletion analysis and posit a unique underlying form for the Irrealis affix, namely /a/, which deletes after a vowel.² The real difference between the two views is whether the /a/ segment (and its silent equivalent for vocalic verbs) is an affix on verbs or a part of NEG.

Discussing these two approaches, Shibatani (1990) points out that the first approach maintains a solid morphological generalization which the second one has to abandon. The generalization is the following. In Japanese morphology, affixes which cannot infect any further attach to bare roots. This category includes affixes such as *-ru* (nonpast), *-i* (Adverbial), *-te* (Hypothetical), etc., which all attach to bare roots. In contrast, other affixes and auxiliaries which can infect themselves do not take bare

² In connection with the issue of the phonological derivation of the phonetically optional /a/ (and /i/, etc.), Shibatani (1990) points out that the motto of generative phonological analysis — "one underlying form for one morpheme" — is not borne out in Japanese morphology in general, given that there is a different imperative form for different kinds of roots: *-e* for consonantal verbs (e.g., *hair-e*) and *-ro/o* for vocalic verbs (e.g., *mi-ro/mi-o*). Thus, positing the unique underlying form may arguably not be an advantage for deletion analyses such as McCawley (1968).

roots; they select inflected forms such as Irrealis, Adverbial, etc.³ This other category includes auxiliaries such as passive *renu*, which selects Irrealis forms, desiderative *tai*, which selects Adverbial forms, etc. The past affix -*ta*, which selects Adverbial forms, belongs to this latter category, unlike the nonpast -*(r)u*, because -*ta* can inflict as -*tara* (hypothetical) or -*taro(s)* (past presumptive). (See Table 3.2, which will appear later in section 3.2.2 for the classification with examples). Since the negative predicate *noi* is an auxiliary and may inflict, 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 postulate Irrealis affixes /a/ or \emptyset and have *na*+Tense as the negative marker. Aside from this morpho-phonological treatment, our structure is as in (3).

³ The "inflected form" here includes the forms with the null affixation of vocalic verbs (i.e., Irrealis and Adverbial of vocalic verbs, which are root plus null affixes). Although these forms are equal to the bare roots phonetically, they must be recognized as inflected forms if we are to capture generalizations in morphology, as Shibatani does.

⁴ This analysis forces one to posit both /*rare*/ and /*re*/ for passive/honorific, as well as both /*sase*/ and /*se*/ for causative, which attach to the Irrealis forms of appropriate verb classes (i.e., the long form is chosen for vocalic verbs and the short form is chosen for consonantal verbs). In this respect, McCawley's analysis, which posits only /*rare*/ and /*sase*/ and derives the appropriate surface forms by deletion of /*ri*/ and /*si*/ after consonantal roots, may be more attractive. However, Shibatani (1990) claims that such deletion rules are dubious on morphological grounds, because they apply uniformly without distinguishing inflectional affixes and auxiliaries (e.g., /*ri*/ deletion applies both to provisional -*reba* and to the passive -*rare*). Thus, we follow Shibatani and accept the postulation of two forms for passive/honorific and causative. See Shibatani (1990, section 10.3) for details.

essentially the same as standard analyses, and requires no further justification (cf. Kato (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, and also at the end of Chapter 4, we will come back to the correlation of our analyses in this dissertation with Shibatani's inflectional morphology.

3.1.2. Two 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 negative clause structure in (1)?⁵ 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.

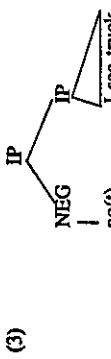
It has been observed that negative markers are often placed in sentence-initial position in early child English, as in (2), in contrast to adult English (cf. Bloom (1970) and references under the examples, among others).

- (2) a. No I see truck.
b. Not Fraser read it.
c. No Mommy doing.
d. No lamb have it.
(a.,b. from Bellugi (1967), c., d. from Déprez 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 child Japanese.

Omitting discussion of the semantic status of these sentences in children's grammar, we review two proposals concerning their structure.⁶ The classical analysis posits different phrase structures for children and adults. Specifically, Klíma and Bellugi (1966), Bellugi (1967), and Menyuk (1969) postulate that the negative marker is adjoined onto matrix clauses, as in (3), in child English.



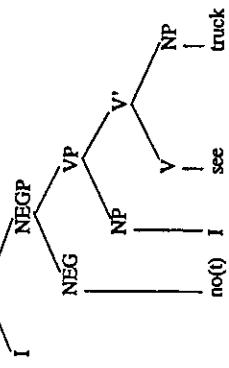
The negation structure in (3) is not allowed in adult English syntax and hence it must be somehow replaced by the adult structure at some point in language development.

In contrast, Déprez 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,

⁵ Though Déprez and Pierce (1993) state that the negation in question is not anaphoric, these negation errors may differ semantically from simple sentential negation. That is, no *I see truck* in child English may not mean *I don't* see *(a) truck* in adult English. See Drodz (1995) on the discourse semantics of External Negation in child English. We do not consider this important point, concentrating on the structural issue. Incidentally, External Negation in child Japanese does not seem to differ from Internal Negation on such semantic grounds, judging from the discourse context.

as in (4) (cf. Fukui (1986), Kitagawa (1986), Koopman and Sportiche (1988), Kuroda (1988) for the VP-internal subjects in adult syntax).⁷

- (4) a. No I see truck.
b. Not Fraser read it.
c. No Mommy doing.
d. No lamb have it.
(a.,b. from Bellugi (1967), c., d. from Déprez and Pierce (1993))



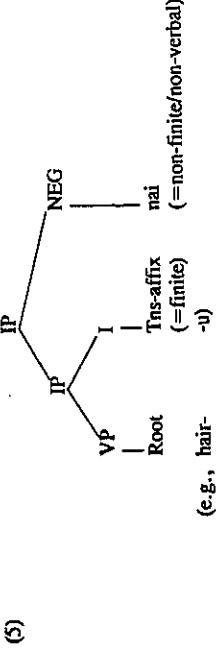
On this view, the structure of negative sentences is the same for children and adults.⁷ The shift to the adult grammar involves the acquisition of subject raising from SPEC of VP to SPEC of IP. According to Pierce (1992), this is triggered by the input data of negative sentences and non-interrogative sentences containing modals and auxiliaries, given that they contain clear evidence of subjects being to the left of NEG or I.

⁶ Whether *not(t)* is in NEG head or in SPEC of NEGP is not obvious. Déprez and Pierce place it in SPEC of NEGP, but the decision should be contingent on various theoretical issues such as the blocking effect of LF-raising of finite verbs, which induces *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 NEGP for the purpose of making the comparison with Japanese easier, and nothing hinges on this point.

⁷ See Roeper (1972) and Lefèvre (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 difference 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 phrase of the sentence — the subject NP in the case of Déprez and Pierce (1993).

We can view child Japanese with two parallel patterns. External Negation has the structure in (5), if the locus of the deviation from the adult structure is the position of NEG, which is adjoined to the right periphery of the clause, though this is not the case in the adult grammar (cf. the adult structure in (1)).



This is suggested in Ito (1990) and Nakamura (1992). It leads us to claim the following:
 i) *nai* is non-finite or non-verbal and adjoined to finite IP in children's External Negation, and ii) the verbs with finite affixes in External Negation are indeed finite (cf. the finite forms of verbs in External Negation are heavily restricted to nonpast forms, that is, past verbs are rare in External Negation, as we will discuss later).

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clauses requires complementation of the clause by a subordinating phrase *no de wa*, which nominalizes the lower clause, as in (7).⁴

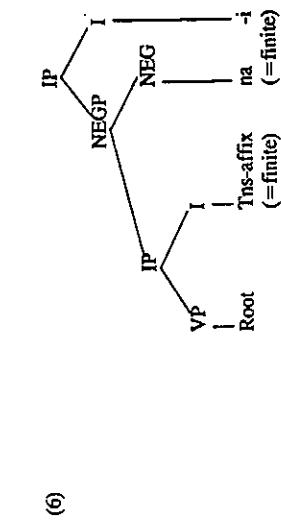
- (7) [Taro ga soo ita no] de wa nai (koto)
 nom so say-(+P) Nom as top not(-P)
 '(It) is not that Taro said so'
 (Nom: Nominalizer)

Thus, using the bi-clausal structure (6), we might postulate that children's External Negation involves the omission of the subordinating phrase *no 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 sentential negation in meaning, in that it is anomalous without presuppositions 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 presented below will apply to the bi-clausal analysis as well (cf. section 3.3.2).

Hence, if the position of NEG in External Negation is not different from the adult structure, the finite nonpast 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 posit the nonpast form as a non-

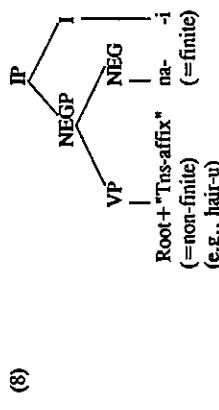
Here is a short comment on the status of *nai*. By "non-verbal NEG", we mean NEG's such as English *not* or French *pas*. It is not obvious what "non-finite NEG" could be in this adjoined context. It could be impossible on independent theoretical grounds. The possibility that *nai* is "non-finite" in External Negation is hypothesized, simply because, in External Negation, verbs take the finite forms and *nai* is almost always uninflected. That is, if we rely on superficial morphology, it appears that the negated verb is finite and *nai* 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 adjoined to IP and it is not a finite auxiliary. We will discuss the finiteness of *nai* later in section 3.4.

A variant of the analysis in (5) is to postulate a bi-clausal structure for External Negation, having both the verb and NEG as finite, as in (6).



In this bi-clausal structure, the tense affixes attached to the verb and the negative marker are 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

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



The claims that follow from this analysis are the opposite from those of the previous structure in (5): i) *nai* is a finite verbal predicate even in child Japanese, ii) in External Negation, children may mistakenly use finite forms in lieu of the Irrealis 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 (8).

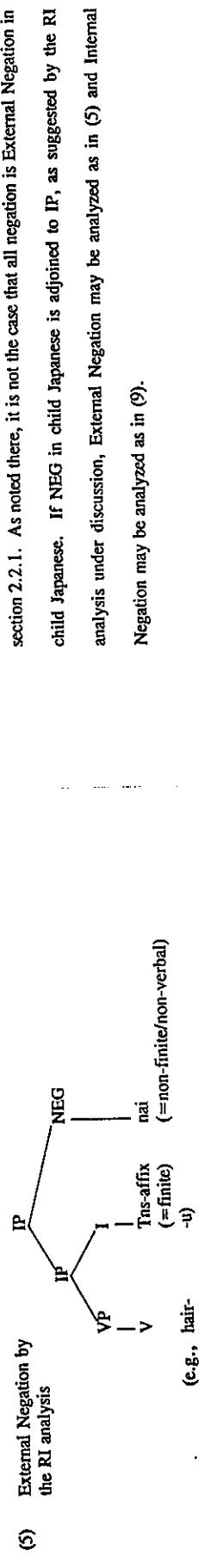
3.1.3. External Negation ≠ Root Infinitives

One candidate for the source of External Negation in child Japanese is the status of NEG. According to this idea, children's External Negation utilizes a different NEG from the adult structure. There are two possibilities. One is to claim that children's NEG is always different from the adults'. The other is to claim that children's NEG differs from the adults' in External Negation, but it is the same as the adults' in Internal Negation, which is optionally found at the stage of External Negation. In this subsection, we

⁴ In colloquial speech, the phrase *de wa* is shortened as *ja*.

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), repeated below, NEG is non-finite or non-verbal and in a clause-external position, while, in adult Japanese, it is a finite auxiliary (hence verbal) in the position lower than I (hence clause-internal) (cf. (1)).

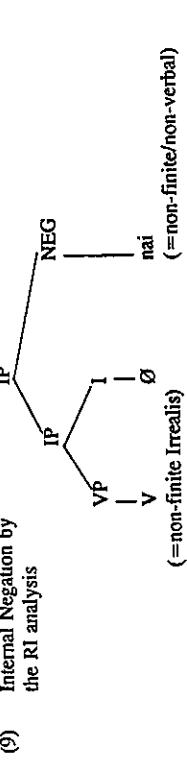


Thus, in (5), External Negation is illicit because NEG has a different status than it does in the adult's grammar. Below, we will show that this structure (and the status of NEG in it) cannot be adopted as the only one for the negation structure of children producing External Negation. In other words, 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 adjoined at a clause-external position in External Negation, we may be able to link the optionality between finite forms and non-finite Irrealis 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 optionality in child Japanese would be necessary, and it would be subsumed under the account of root infinitives, whatever it is. Let us call this Root Infinitive (RI) analysis.

The RI analysis *prima facie* works 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 adjoined 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 (9).



In (9), the main verb of the clause is a non-finite (Irrealis) verb, as in the root infinitives in European child languages, in contrast to (5), which has a finite verb as the main verb. Why the I node may be empty (or, more precisely, somehow underspecified with respect to its features) in (9) 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 languages, 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 adjoined to IP under the RI analysis, negative clauses are derived simply by adjoining NEG to affirmative clauses without affecting their internal structures. In other words, affirmative clauses under the RI analysis are "what remains after removing NEG from negative clauses". Thus, all else being equal, the optionality between finite and non-finite forms is expected to be found in affirmative clauses, as well.⁹ 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 impossible to analyze NEG in child Japanese as always adjoined clause-externally.

Next, we will discuss how to account for External Negation without wrongly overgenerating 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 adjoined 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 Irrealis forms, that is, the child wrongly uses nonpast forms as Irrealis under negation. Morphological considerations of children's data lead us to argue for the latter analysis.

Taking into consideration the fact that NEG in early child Japanese cannot be a clause-externally adjoined element across-the-board, as shown in the previous section by the lack of root Irrealis in affirmative sentences, two options remain with respect to the status of NEG at the stage of External Negation, given that Irrealis verbs are not overgenerated 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 adjoined NEG for External Negation. We will call them Inner NEG and Outer NEG,

⁹ Rizzi (1994) considers the possibility that RI's might be restricted to affirmative clauses only, while pointing out that there are open issues, both theoretically and empirically. It is not impossible to admit the opposite possibility, that is, RI's are restricted to negative clauses only (in Japanese). However, it requires theoretical justification, which is hard to conceive. At any rate, since discussions that follow will lead to a different analysis, we do not pursue this possibility.

respectively. The Outer NEG can be identified as the NEG in some Romance languages or Basque (cf. Laka (1990), Zanuttini (1991)). Provided the existence of these languages with Outer NEG's (e.g., Basque *ez*¹⁰, Italian *non*) and others with Inner NEG (e.g., English *not*, French *pas*, Italian *più*), this analysis can be viewed as a case of parameter missetting: given the two options available in UG, children at first cannot decide between the two and place *nai* in either of them, optionally. We call this the Parameter Missetting analysis.¹¹ 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 Missetting approach. In particular, parameter missetting accounts always face the 'triggering problem' (cf. Borer and Wexler (1987)), and hence some maturation must be assumed to derive the stages of prior to and subsequent to the triggering of the correct setting.¹²

¹⁰ Laka (1990) argues, on the basis of her syntactic 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 oversimplification 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 is argued for in some adult languages.

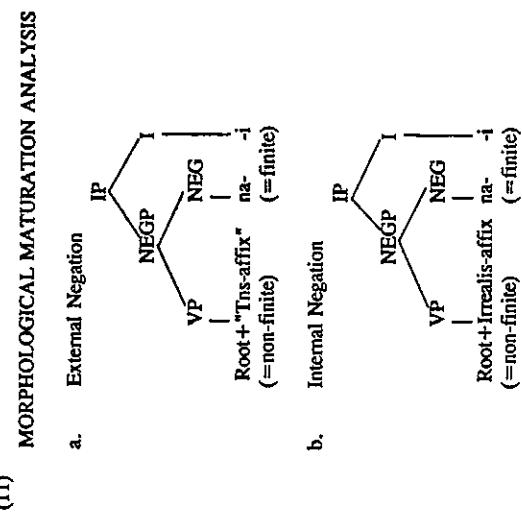
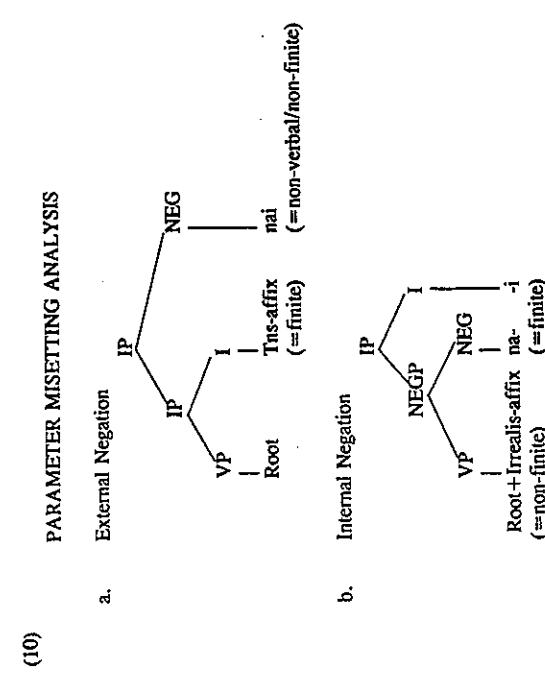
¹¹ Strictly speaking, the "missetting" here is rather "open setting" of a parameter, rather than a missetting, in the sense that children have both Outer and Inner NEG's, not just the Outer NEG, while adults have the Inner NEG only. We continue to use the term "missetting" in referring to this type of "open setting", to avoid complicating the terminology.

¹² Thus, children are denied access to the triggering data by the assumed immaturity, though the triggering data exists in the input. The Parameter Missetting analysis requires clarification of the kind of data that may serve as the triggering data. In this particular

The second possibility is to postulate only one NEG, which is an adult-like auxiliary, in child Japanese, sticking to the minimum requirement. Then, External Negation would involve an error of V-inflection. Being an auxiliary, *nai* selects non-finite Irrealis as V in child Japanese as well as in adult Japanese. Hence, according to this analysis, the finite forms in External Negation should have the structural status of Irrealis, even though they are not the right Irrealis form for adult Japanese. In other words, children know that negated verbs must be inflected as Irrealis, but at first do not know the right form and use the finite forms instead. Thus, External Negation results from a delay in Irrealis acquisition in lexical development. Here again, some maturation must be assumed. However, it is a restrictive claim in that it calls for no maturation of UG principles and does not even admit missetting of parameters, and, consequently, possible operations in UG are not increased for the sake of describing External Negation. Maturation under this analysis occurs in the morphological component of innate linguistic capacity: there is maturation of some morphological operations, which underlies correct Irrealis formation. We will call this the Morphological Maturation analysis. We will later clarify exactly what aspect of morphology matures as children outgrow the External Negation stage.

According to this analysis, the optionality of External Negation and Internal Negation lies in the optionality of morphological forms for Irrealis in negation. We illustrate the Morphological Maturation analysis below.

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



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

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

3.2.2. Two Kinds of Roots in Japanese Verbal Morphology

The basic paradigm of Japanese inflectional morphology consists of roots and tense affixes. Shibatani (1990) presents the composition of Japanese verbal morphology as in

(12).

(12)	<u>Root + Inflectional affix (+ Auxiliary) (+Particle)</u>	
	Stem	cf. Shibatani (1990, p.224)

The inflectional affixes include: nonpast (Conclusive form, *syuu-i-ker*), Irrealis (*nizen-ker*), and Adverbial (*renyoo-ker*), etc. The auxiliaries include: negative *nai*, desiderative *tai*, and past *-ta*, among others. The past *-ta* is an affix but is treated on a par with auxiliaries, since it may inflect (e.g., *-ta-ra* (Hypothetical)) and attaches to a root+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 *-te*, which selects Adverbial forms and may be selected by the auxiliary *iru*, deriving the progressive or resultative as *-te iru*. For our current purpose, it suffices to recognize that Irrealis is an affix attaching to the root, and the complex of the root plus Irrealis affix is selected by negative auxiliary *nai*.

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

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

Now, we will review the root-oriented classification, consonantal vs. vocalic (cf. Block (1946), introduced in Chapter 2, focusing on negation and finite tense forms. This classification will play a crucial role in comparing the Parameter Missetting analysis and the Morphological Maturation analysis of External Negation.

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

(13) Inflectional Paradigms of Consonantal Verbs:

nonpast:	'enter'	'attach'	'drink'
past:	hair-u	tsuk-u	nom-u
nonpast neg:	hai-ta	tsui-ta	non-da

In addition, there are two auxiliary constructions which appear in early child Japanese and hence require consideration in the examination of negation-types. Both of

these are vocalic verbs. One is an auxiliary construction with *-te iru*, which translates roughly as a progressive and could be resultative with unaccusative verbs (cf. Takezawa (1991)). This *-te iru* construction is classified as a vocalic verb here. This makes sense because it consists of non-finite verbs ending with *-te* and an auxiliary *iru*, which is a vocalic verb itself. The paradigm is in (13).

Table 3.1: Japanese Inflectional Affixation Paradigm

Verb Class			
Inflectional Form	Consonantal	Vocalic	
Irrealis	root-a	root-Ø	
Adverbial	root-i	root-Ø	
Conclusive	root-u	root-ni	
Attributive	root-u	root-ni	
Hypothetical	root-e	root-re	
Imperative	root-e	root-ro/yo	
			(-Ø: phonetically-null)

The two verb classes, consonantal and vocalic, were introduced in Chapter 2, and we will shortly reiterate 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 negation *nai* selects Irrealis, other auxiliaries and particles select their own inflectional affixes. The subcategorization of selected items is summarized in the table below.

Table 3.2: Subcategorization of Auxiliaries and Particles according to the Selection of Inflectional Affixes

Irrealis:	<i>seru, sasenu, reru, rarenu</i> (Voice/Honorific); <i>nai</i> (Negative)
Adverbial:	<i>ta</i> (Past); <i>tai</i> (Desiderative); <i>masu</i> (Polite); <i>soo</i> (da) (Conjunctural); <i>te, tari, tutu, nagara</i> (Conjunctive Particle)
Conclusive:	<i>rasii, soo</i> (da) (Hearsay); <i>to, kara, ga</i> (Conjunctive Particle)
Hypothetical:	<i>ba</i> (Conjunctive Particle)

cf. Shibatani (1990, p.224)

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

Now, we will review the root-oriented classification, consonantal vs. vocalic (cf. Block (1946), introduced in Chapter 2, focusing on negation and finite tense forms. This classification will play a crucial role in comparing the Parameter Missetting analysis and the Morphological Maturation analysis of External Negation.

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

(13)	Inflectional Paradigms of Consonantal Verbs:
nonpast:	'enter'
past:	hair-u
nonpast neg:	hai-ta

This class takes *-u* as a nonpast affix, which may be underlyingly */-ru/* accompanied by deletion of */-r/* after a consonant. Negation in this class is derived by having the finite negative predicate *nai* to the right of the Irrealis form derived by a root plus an affix */-j/*. The past is derived by attaching the affix *-ta* to the Adverbial form, which, with consonantal verbs, triggers several phonological changes, known as *onbin* ('sound euphony'). The sound changes may be observed in the paradigm in (13): the sound preceding *-ta* differentiates the past forms from others. The past affix gets voiced when roots end with a nasal, as in *nor-da*. 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 *-ru* as a nonpast affix and *-ta* 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 Irrealis form of a vocalic verb is phonetically equal to the root.

(14)	Inflectional Paradigms of Vocalic Verbs:
nonpast:	'be/exist'
past:	i-ru
nonpast neg:	i-na-i

In addition, there are two auxiliary constructions which appear in early child Japanese and hence require consideration in the examination of negation-types. Both of these are vocalic verbs. One is an auxiliary construction with *-te iru*, which translates roughly as a progressive and could be resultative with unaccusative verbs (cf. Takezawa (1991)). This *-te iru* construction is classified as a vocalic verb here. This makes sense because it consists of non-finite verbs ending with *-te* and an auxiliary *iru*, which is a vocalic verb itself. The paradigm is in (13).

There are irregular verbs *suru* 'do' and *kuru* 'come'. They cannot be classified into the consonantal/vocalic dichotomy because of the irregularity of their inflection. Since we exclude them from our examination of children's negation, we do not introduce them here.

- (15) Inflectional Paradigms of *-te iru* (Vocalic):
- | | | |
|--------------|---------------------------|---------------|
| | 'has entered/is entering' | 'is sleeping' |
| nonpast: | hai-te i-ru | ne-te i-ru |
| past: | hai-te i-ta | ne-te i-ta |
| nonpast neg: | hai-te i-na-i | ne-te i-na-i |

The sound /i/ in the auxiliary is optionally pronounced after *-te* in colloquial speech, and it is almost always omitted in early child Japanese. Still, this does not affect the classification. The affixes or auxiliaries in the paradigm, *i/ru*, *i/ta*, *i/nai*, are always preceded by one uniform vowel, which may be either /e/ or /i/, depending on the optional sound /i/ in the auxiliary. Thus, the *-te iru* construction is classified as a vocalic verb.

The other auxiliary construction which we deal with is the potential *-re-ru* verb, which is colloquial and different from the traditional potential auxiliary *reru/rarenu*, which attaches to *Ireadis* (cf. Table 3.2) in that the former attaches to the bare root (cf. Shibaiani (1990, p.236-237) for discussions of the two). The potential verbs, which are historically new but normal and accepted in present Japanese, are vocalic verbs with respect to tense inflections and negation, as exemplified below.

- (16) Inflectional Paradigms of *-re ru* (Vocalic):
- | | | |
|--------------|-------------|-------------|
| | 'can enter' | 'can sleep' |
| nonpast: | hai-e-ru | ne-e-ru |
| past: | hai-e-ta | ne-e-ta |
| nonpast neg: | hai-e-na-i | ne-e-na-i |

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 verbs. On the basis of this asymmetry, we will argue for the Morphological Maturation analysis over the Parameter Missetting analysis.

3.2.3.1. Methodology

First, we need to make a methodological remark. The transcripts used for the examination are of the three children who produced External Negation frequently, among those four introduced in Chapter 2. The proportion 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 constructions, *-te iru* and *-re-ru* are now included. These constructions 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 *nai* is in the Outer NEG outside of IP, as in the Parameter Missetting analysis, then External Negation should occur with *-te iru* and *-re-ru* also, as well as with finite verbs without auxiliaries. Second, irregular verbs are excluded because the consonantal/vocalic classification does not apply to them.¹³

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 *-ru* 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, External Negation is exceedingly rare with vocalic verbs. This is shown in Table 3.3.

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 proportion 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, Parameter

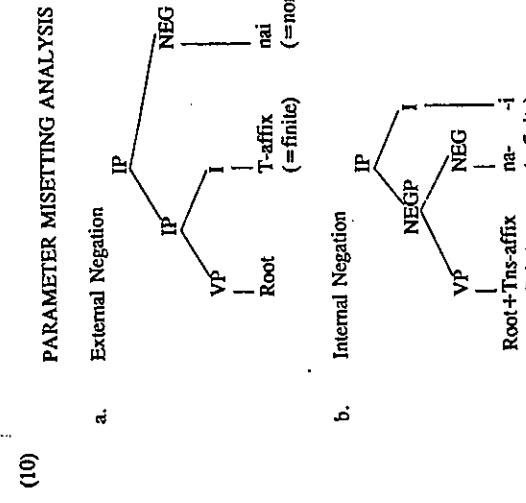
Table 3.3: Negation Types in child Japanese divided into the two Root-Classes

Child (age)	Verb Classes and Types of Negation		
	Consonantal	Vocalic	Internal
Toshi (2;3-2;8)	26 (72%)	10	0 (0%)
Ken (2;8-2;10)	30 (55%)	25	4 (7%)
Masanori (2;4)	6 (55%)	5	2 (6%)
Total	62 (61%)	40	6 (5%)
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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, $\chi^2=28.58$; Ken, $\chi^2=27.70$; Masanori, $\chi^2=11.06$, all $p < .001$) and for the total ($\chi^2=76.89$, $p < .001$). A further analysis based on verb-types, not tokens as in Table 3.3, is given in the Appendix of this chapter.

¹³ 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 (6 Internal, 1 External), Masanori (3 Internal).

Missetting and Morphological Maturation, based on the asymmetry we have found. Recall, first of all, that there are two NEG positions under the Parameter Missetting analysis. The illustration of the two patterns are reproduced below.



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 Irrealis would be overgenerated in affirmative clauses: if the Outer NEG, the clause-externally adjoined negative marker, is allowed to cooccur with Irrealis verbs, then the Irrealis form is the main verb in such clauses, and hence it should be generally possible to have the Irrealis

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forms as main verbs, whether the clause is negative or affirmative. However, the absence of root Irrealis in affirmative clauses was firmly established earlier (cf. section 2.2.2.2).

Notice that External Negation is made possible solely on the basis of the existence of the Outer NEG under the Parameter Missetting analysis, and hence the sensitivity to the root-class, consonantal 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 negation-types cannot be explained under the Parameter Missetting analysis. What it predicts is that the proportion of External Negation should be insensitive to the root-class, that is, not significantly different between consonantal verbs and vocalic verbs, contrary to fact.

We will argue that the Morphological Maturation analysis, which postulates that children simply fail to use the correct Irrealis 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 Irrealis of consonantal verbs, thereby giving rise to External Negation, while they seldom make the error of Irrealis forms with vocalic verbs? We will answer this question by showing that Irrealis formation is morphologically more complex with consonantal verbs than with vocalic verbs, and by claiming that there is a maturation of the morphological operations involved with consonantal Irrealis formation.

Irrealis formation is more complex with consonantal verbs than with vocalic verbs

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in two respects. First, it is plausible that the isolation of roots, which is necessary for deriving the Irrealis form, is relatively more difficult for consonantal verbs than for vocalic verbs. This is because there are some historical sound change rules known as *onbin* (sound euphony) in Japanese phonology, which trigger various phonological changes in forming the past forms of consonantal verbs. When the nonpast form and the past form of consonantal verbs are compared in (13), we see that there are phonological alternations in the final sound of the root, because of the sound euphony, namely gemination, velar-vocalization, and nasal-assimilation¹⁴, respectively.

(13) Inflectional Paradigms of Consonantal Verbs:

nonpast:	'enter'	'attach'	'drink'	
past:	hair-u	tsuk-u	nom-u	
nonpast neg:	hair-ta	tsui-ta	non-da	
	hair-a na-i	tsuk-a na-i	nom-a na-i	

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).

(14) Inflectional Paradigms of Vocalic Verbs:

nonpast:	i-tu	'be/exist'	'sleep'	'eat'
past:	i-ta	ne-tu	ne-ta	tabe-ta
nonpast neg:	i na-i	ne na-i	ne na-i	tabe na-i

Thus, for the class of vocalic verbs, it is easy to form the Irrealis given pairs of nonpast and past forms, while for the consonantal verbs, even when the nonpast/past alternation is acquired, it does not automatically follow that the root is identified, because it must be reconstructed from undoing the sound euphony (cf. section 2.2.2.1 for the derivation of past forms). In other words, because Japanese phonology prohibits coda consonants except for /n/ in the syllable structure (cf. Ito (1986)), it is not possible at the phonological level, to simply extract the bare root of consonantal verbs by taking out the nonpast affix from nonpast forms. Therefore, there is a principled relative complexity in root identification, and consequently in Irrealis formation, with consonantal verbs as compared with vocalic verbs.

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

¹⁴ In traditional Japanese grammar, the whole process which ends up with /n/ in the stem-final position is called *husu-onbin* all together, and refers to this as nasal-assimilation. This includes place-assimilation of nasals in the case of the verb 'drink' in the text, and another case such as the following. The past of the verb *tabe-u* 'fly' is *ton-da*. Here, another alternation is involved before place-assimilation. /b/ in the stem is nasalized to avoid a non-nasal coda, and then /m/ becomes /n/ by place-assimilation. Incidentally, the voicing in the past affix (*ta* -> *da*) follows nasal-assimilation.

violate the requirement of Japanese phonology that codas must be null except for /n/ and hence producing the roots alone results in phonologically illicit forms. Thus, for consonantal verbs, the Irrealis affix -a must be acquired, that is, the affix -a must be learned to be associated with the irrealis (or, negative) meaning. This means that children must differentiate this affix from other non-finite 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 between 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 continuously 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 matures.

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

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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-finite Irrealis, despite their appearance. First, we will address conceptual issues: whether the claim denies the developmental continuity of functional projections, and whether it runs into the Subset Problem (cf. Berwick (1985)). Second, we will consider an empirical point related to the claim: why there 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 issue,

children's misanalysis; we argue that it is the maturation of consonantal irrealis formation and Hyams suggests that it is the misanalysis of NEG element. Her proposal can explain the lack of past NEG *nakata* in External 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 -ta would be misanalyzed in the same way given that the inflected forms of -ta, such as -te-ra, are not found at early stages. If both -ta and nai are non-AUX affixes, wrong past forms such as *haiyu ta* ('entered') are expected to occur in a parallel way with the External Negation errors, but such overgeneration is unattested. There are other analyses in unpublished works. Unshibara (1991) argues that External Negation involves the misplacement of the NEG element in the Modal head which is projected as the highest head of a clause, whereas it must be placed in NEG, M(odality). Ura (1995) analyzes External Negation as involving the Weak Feature in I, while I has the Strong feature in adult Japanese (cf. Chomsky (1993) for Strong/Weak features). 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 analyses predict the free occurrence of past verbs in External Negation, which is very unlikely according to our data (cf. section 3.3.2), and they do not account for the asymmetry between consonantal and vocalic verbs.

In this way, the Morphological Maturation analysis can explain the morpho-phonology-based asymmetry because it posits that the optionality 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 Infinitive analysis, the Parameter Missetting analysis, and the Morphological Maturation analysis. The Root Infinitive analysis was rejected because of the lack of root infinitives (in particular root Irrealis) in Japanese affirmative clauses. By examining the relation between children's negation types (External or Internal) 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-phonology-based sensitivity is unexpected under the Parameter Missetting 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 Irrealis forms, in other words, the maturation of consonantal Irrealis formation.¹⁵ Below, we will address further issues

¹⁵ Nina Hyams (p.c.) suggested an alternative analysis: children misanalyze *nai* as an affix on a par with nonpast -fju at first, since the uninflamed functional elements belong to the non-AUX-affix in Japanese and children rarely (or never) inflect *nai* at the External Negation stage. If so, children need bare roots under negation because the non-AUX-affix attaches to bare roots, as we discussed following Shibatani (1990). Then, the asymmetry between consonantal and vocalic verbs may be explained in a way parallel to our account: children have no problems with vocalic verbs, because their root is equal to the Irrealis phonetically, while they cannot derive bare roots from consonantal verbs because they involve ill-formed syllables and end up adopting nonpast forms as substitutes. Thus, the account is close to ours but differs with respect to the locus of substitution.

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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-finite 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 inflection, 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 verb 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 continuously know that negated verbs must inflect as Irrealis, their knowledge of Irrealis inflection is innate and continuous; it is not learned. Thus, the analysis takes the Strong UG 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 Subset Problem. When the

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child grammar (G_c) consists of the adult grammar (G_a) and some incorrect child grammar (G_{ia}), 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 G_a is consistent with G_c , because G_c includes G_a , as well as G_{ia} . Thus, it is not possible to eliminate G_{ia} from G_c based on the input coming from G_a . This is called the Subset Problem (cf. Berwick (1985), Wexler and Manzini (1987), see Angluin (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 $Irealis$ in morpho-syntax, and the negated verb is always selected by NEG as $Irealis$ in morpho-syntax. 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 Nonpast for $Irealis$: Empirical Issues

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

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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 Guilfoyle and Noonan (1988) for English, Grinstead (1994) for Catalan and Spanish, and Poeppl and Wexler (1993) for German). Given the early acquisition of past forms in Japanese affirmative sentences, some account is necessary for the lack of past verbs co-occurring with External Negation.¹⁷

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

The other speculation we can make is morphological. Recall that the past affix $-ta$ is morphologically an auxiliary, which takes a root inflected as Adverbial, while the inflectional morphology in general.

Table 3.5: Nonpast/past forms in Affirmative Sentences at the stage of External Negation

Child (age)	Tense of Verbs	
	nonpast - <i>ta</i>	past - <i>ta</i>
Toshi (2;3-2;8)	288	84
Ken (2;9-2;10)	111	175
Masanori (2;4)	138	50

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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 Guilfoyle and Noonan (1988) for English, Grinstead (1994) for Catalan and Spanish, and Poeppl and Wexler (1993) for German). Given the early acquisition of past forms in Japanese affirmative sentences, some account is necessary for the lack of past verbs co-occurring with External Negation.¹⁷

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The other speculation we can make is morphological. Recall that the past affix $-ta$ is morphologically an auxiliary, which takes a root inflected as Adverbial, while the inflectional morphology in general.

Table 3.4: Nonpast/past forms in External Negation

Tense of Negated Verbs in External Negation	
Child (age)	nonpast -(r)u past - <i>ta</i>
Toshi (2;3-2;8)	24
Ken (2;9-2;10)	33
Masanori (2;4)	8
Total	65
	3 (4.4%)

Of course, a simple explanation would be to resort to the status of nonpast forms as the most common form.

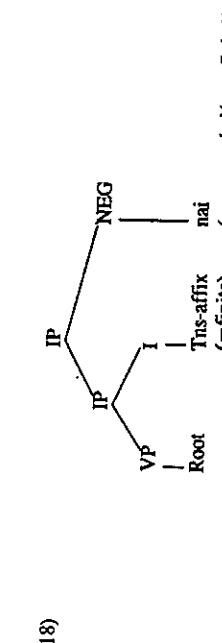
However, the past form is observed to be productive in affirmative sentences at the relevant early stage in Japanese acquisition, as shown in Chapter 2 (cf. Table 2.4).

The relevant part of the table is reproduced below as Table 3.5. In the data of the three children in the table, both nonpast and past forms are observed to be substantially productive during the period in which External Negation is observed.¹⁶

¹⁶ Though the proportional difference between Ken and the other two is curious, it is not of concern to us. In fact, the proportion that should be considered is how often each form is used correctly in obligatory contexts for each form. Our point with the table is, simply, that the past forms are productively used.

nonpast affix -(*r*)u is an affix directly attaching to a root, and so is the $Irealis$ affix (cf. (12) for schematic illustration of the difference). This means that, morphologically, the past form (i.e., root+affix+auxiliary) has a different status from the $Irealis$ form (i.e., root+affix), while the nonpast form and the $Irealis$ form have an equal status (i.e., both being root+affix only). The absence of past forms in External Negation may follow from the morphological difference between nonpast and $Irealis$ 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 nonpast for $Irealis$, because they have the same morphological status, but do not substitute past for $Irealis$, because they have a different morphological status.

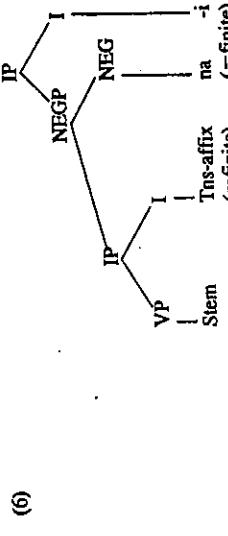
Let us now turn to what the lack of past forms in External Negation implies for other analyses. The absence of past forms goes against the analyses of External Negation with the Outer NEG in general. Recall that the Root Infinitive analysis postulates the Outer NEG for all negation of children's utterances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



¹⁷ See Clancy (1985, p.425-7) and references therein for the acquisition of Japanese inflectional morphology in general.

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 those analyses which treat the nonpast forms as real nonpast, not the substitute of Irrealis, in External Negation.

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



We did not consider this in detail, pointing out that bi-clausal negation in adult Japanese is semantically different from mono-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 Irrealis, as seen in (6), 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 consonantal verbs and vocalic verbs, is also unexpected under the Bi-clausal

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analysis, because NEG, though a finite auxiliary, does not select Irrealis verbs in the Bi-clausal analysis. Rather, the two clauses are independent and are simply combined without subcategorization.

3.4. The Continuity of Finiteness 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 *nakatta* may be arguably unexpected on our analysis. If NEG is always finite, why don't we find any past forms? Some account is necessary of 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 root infinitives, namely, an auxiliary-element is always finite in language development.

3.4.1. The absence of Past NEG

According to our Morphological Maturation analysis, NEG *nai* 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 *nakatta*, as well as the nonpast form of *nai*? Empirically, the past form *nakatta* is very rarely found at the stage of External Negation, as shown in Table 3.6.

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Table 3.6: Occurrences of the past form of negation at the stage of External Negation

Child (age)	Occurrences of <i>nakatta</i> (past of <i>nai</i>)
Toshi (2;3;2;8)	0
Ken (2;8;2;10)	1
Masanori (2;4)	1

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

- (19) a. ake-ta na-kat-ta naa
open(+P) not(+P) particle
'(I did) not open (?)' (Ken 2;9)

b. na-*ka-kat-ta no?
not(+P) particle
'there was not (a bag)?' (Masanori 2;4)

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 redundant morpheme *-ta*. Overall, even without discrediting those two examples, there seems to be no clear indication of productive use of the past form of the negative predicate.

However, this is not a real problem for our analysis. Notice that the past form *nakatta* 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 *nakatta* 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 *nakatta* in Internal Negation. This position is unsustainable, because it would overgenerate root infinitives (more precisely, root Irrealis) in 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: NEG is continuously finite in child Japanese, but the past forms do not emerge early for some independent reason.¹⁸

¹⁸ Note that Japanese has two ways to negate some proposition of past, as exemplified below.

- (i) watasi wa gohan o tabe te i-na-i
I top meal acc eat(ADV) CONJ be-not(-P)
'I have not eaten a meal'

(ii) watasi wa gohan o tabe na-kat-ta
top meal acc eat(IR) not-(+P)
'I did not eat a meal'

Compared with tense in European languages, (i) corresponds to (present) perfect, while (ii) corresponds to preterite, which refers to past without relating to present. It is only (ii) that involves the past of NEG, *nakatta*, in Japanese, and it is perhaps generally true that the preterite is acquired later than the non-preterite-past (cf. Antinucci and Miller (1976)), that is, present 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 *nai* is finite in child 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 modals always occur in finite form and in the correct position in adult languages, even during the root infinitive stage (cf. Bahtier (1993), Rizzi (1994) and Wexler (1994)). That is, examples such as those in (20) are not found in children's transcripts.

- | | | | |
|------|----|---------------------------------|----------|
| (20) | a. | *avoir mangé
to have eaten | (French) |
| | b. | *être venu
(to have come) | (French) |
| | c. | gekauft haben
bought to have | (German) |
- from Rizzi (1994, p.380)

By collapsing auxiliaries (e.g., *have*, *be*) and modals (e.g., *can*, *may*, 'want') as 'AUX(-elements)', we refer to this phenomenon as 'Continuous AUX-Placement (CAP)'.

Thus, there is continuity 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

verbs in adult Japanese. Hence, it is an AUX-element, just like *be* in English, which cooccurs with non-finite progressive verbs (e.g., *walking*). If *nai* were not finite in External Negation, child Japanese would be an exception to the CAP.

There is empirical evidence which may support our claim that *nai* is finite. The constructions involving AUX-elements in child Japanese, progressive/resultative *-te iru* and potential *-fure-nu*, are extremely rare in External Negation. The data of the three children is provided below for the early stage which we have been examining.

Table 3.7: Negation Types in the Negation of Auxiliaries in child Japanese

Negation Types in the Negation of AUX

Child (age)	External	Internal
Toshi (2;3-2;8)	0	12
Ken (2;8-2;10)	(1) (7.1%)	13
Masanori (2;4)	(1) (3.4%)	28
Total	(2) (3.6%)	53

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

The extreme rarity of AUX-elements under External Negation may receive a principled account if both *nai* and negated AUX-elements (i.e., *-te iru* and *-fure-nu*) are correctly identified as AUX's by children and CAP holds in child Japanese, as we claim.

of being explicit in discussion, we define the CAP as follows:

- (21) Continuous AUX-Placement (CAP)

The observation concerning the finiteness of AUX-elements is found in deHaan (1987) for Dutch, Ferdinand (1994) for French, Park (1971), Boer et al. (1992), Poepel and Wexler (1993) and Clahsen et al. (1994) for German.¹⁹ 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 *pas* in negation). 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 *nai* is finite, we preserve the generality of CAP with child Japanese. Recall that *nai* is a verbal element and it may cooccur with non-finite Irrealis

¹⁹ In Sano and Hyams (1994), the null subject in child English is argued to be PRO, the null subject of infinitives (cf. also Roeper and Rohrbacher (1995) and Bromberg and Wexler (1995)). There, it is pointed out that the null subjects in child English are much rarer with auxiliaries and modals than with lexical verbs. Thus, the analysis implies that child English conforms to the CAP with respect to the phenomenon of null subjects.

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 Irrealis forms, even when the substitution occurs with lexical verbs. If *nai* 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 adjoined NEG for External Negation do not predict the asymmetry between AUX-elements and lexical verbs.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.

²⁰ It may be possible that the AUX/lexical V asymmetry is just a subcase of the consonantal/vocalic asymmetry, since the AUX-elements under consideration are vocalic. 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 rareness of vocalic verbs in External Negation, which has some exceptions. Thus, it seems reasonable to take the AUX/lexical 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 summarize 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 Infinitives in European child languages because it would overgenerate root Irrealis in child Japanese, contrary to fact. In section 3.2, we pointed out that the negation type (External vs. Internal) is significantly sensitive to the root of the negated verbs (consonantal vs. vocalic). We further argued that the root-based asymmetry indicates that the source of External Negation is the immaturity of Irrealis 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 nonpast forms and speculated that this may be due to the semantic or morphological difference between nonpast and past. In section 3.4, we discussed the lack of past NEG *nakatta* 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 Infinitives share a general principle that AUX-elements are continuously finite throughout the development.

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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 tokens, not types, following the convention of statistical analyses of correlation 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 nai* only, it would be too restricted for considering the grammar 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 meaningful to attempt to run another analysis by verb-types, 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: E(xternal), I(nternal), and A(ambiguous)

(22)

- E: if the verb appears in External Neg only or if (its appearances in External Neg minus its appearances in Internal Neg) > 3 .
- I: if the verb appears in Internal Neg only or if (its appearances in Internal Neg minus its appearances in External Neg) > 3 .
- A: if (the difference between its appearances in Internal Neg and its appearances in External Neg) ≤ 3 .

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)

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

C/E:	hairu, hasiru, tuku, takuru
C/I:	iru, naku, ugoku
C/A:	aku, iku
V/E:	Ø
V/I:	akeru, deru, dekiru, iju, kieru, tomeru, -(f)e-ru, -te (i)ru
V/A:	Ø

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

C/E:	aku, aru, hasiru, iku, kaeru, nomu, naru, tuku,
C/I:	iru, naku, ugoku, yaru
C/A:	naru, ugoku, yaru
V/E:	akeru
V/I:	dekinu, iju, kieru, mim, nen, okinu, osiru, toreru, -(f)e-ru, -te (i)ru
V/A:	taberu

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

C/E:	naru, noru, swaru, tuku
C/I:	hairu, iku, yaru
C/A:	Ø
V/E:	nosoru
V/I:	ageru, deru, dekiru, -e-ru, -te (i)ru
V/A:	Ø

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 3.8: 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.)

		Toshi					Ken		
		C	E	V	C	E	V	C	E
C/E:	1	4	0	4	1	3	8	11	$\chi^2 = 9.155$
C/I:	1	3	8		2	0	2	2	$df = 2$
C/A:	A	2	0					p < .02	
		9	8	17					

		Toshi					Ken		
		C	E	V	C	E	V	C	E
C/E:	1	8	1	9	1	2	11	13	$\chi^2 = 12.68$
C/I:	1	3	2	11	3	1	4	2	$df = 2$
C/A:	A	3	1					p < .01	
		13	13	26					

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Masanori			
C	V		
E 4	1	5	$\chi^2 = 2.41$
I 3	5	8	df = 2
A 0	0	0	p < .30
Total			
E 16	2	18	$\chi^2 = 21.51$
I 8	24	32	df = 2
A 5	1	6	p < .001
29	27	56	

Given these results, it seems to be safe to claim that the our result in Table 3.3 is not affected by calculations based on tokens, since the same kind of correlations are observed with the analysis by verb-types in this appendix.

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 RI's, we will propose that inflectional affixes can be divided into two classes, head affixes and adjoined affixes, depending on morphosyntactic properties, that is, whether an affix heads a projection or adjoins to another projection. The adjoined affix, in RI languages, works in the way outlined in Chomsky (1993): it is adjoined to V and undergoes checking against features in I by raising together with the V. The head affix, in non-RI languages, works in the way outlined in Chomsky (1991): they project as the head of I and V raises and adjoins to the affix in I. Based on this morphological distinction, we will derive the typology of RI's in child languages, as well as the typology of the pro-drop phenomenon (cf. Chomsky (1981), Hyams (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 matures at some point in development and that the features in I are underspecified before this maturation, which causes the I-features to arrive at a specification of contrastive values. The underspecified I allows RI's, as well as root finite verbs.

By assuming that the head/adjoined distinction of affixation continuously holds throughout development, we will explain the lack of RI's 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 clauses. We will

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In this chapter, we will discuss the analysis of the root infinitive (RI) phenomenon and the typology of RI's. Recall that in Chapter 3, we explored three candidate explanations for External Negation: the immaturity of some aspect of UG, parameter missetting, and the delay in acquisition of language-particular properties in the lexicon, in other words,

the immaturity of morphology. In general, these are the basic options for explaining phenomena which occur in child languages but not in the target adult languages. Here let us consider which of these works for the RI. Parameter missetting is not a viable explanation for the root infinitive phenomenon, since RI's are not allowed in any adult languages.¹ Moreover, the cross-linguistic variation in connection with root infinitives in child languages, to be discussed in section 4.1, suggests that it cannot be immaturity

¹ This means that subordinate infinitivals do not appear as root clauses, that is, they do not substitute for finite clauses in any adult language. Nonetheless, it is possible that some general properties of infinitivals are realized in finite clauses in some languages. For example, Japanese finite clauses may take the null subject of arbitrary reference, PRO^{Ans}, as in (i) (cf. Saito (1982), Kuroda (1983)).

(i) taima o ka-u koto wa kinzi rare te iru
marijuana acc buy(P) fact top forbidden be(P)
'To buy marijuana is forbidden.'

This may lead to an analysis that Japanese finite tense is somehow neutralized with the non-finite tense (cf. Sano and Hyams (1994) on a similar point based on the temporal interpretation of Japanese subordinate clauses). However, root infinitives are impossible in Japanese. In this sense, the 'neutralization' of finite/non-finite tense is not complete. Thus, we continue to assume that root infinitives are not allowed in any adult language.

TABLE 2.1: Frequency of Root Infinitives in RI Languages

Language	Child Name	Age	% of RI's
French (from Pierce (1992))	Nathalie Daniel	1;7-2;11 1;5-2;5	.76 .60
German (Weissenborn (1990) (from Guasti (1994)))	S 2;1 2;2	1;10 1;11 .53 .40	.61 .73 .53 .40
Dutch (Weverink (1989))	Laura Tobias Fedra	1;8-2;1 1;10-1;11 1;10-2;1	.36 .36 .26

Japanese Root Infinitives in Japanese Affirmative Root Clauses			
	Child Name	Age	%
Root Adverbial/Irealis			
Toshi	2;3-2;8	.00	
Ken	2;9-2;10	.003	
Masanori	2;4	.00	
Root Conjunctive -te			
Toshi	2;3-2;8	.018	
Ken	2;9-2;10	.00	
Masanori	2;4 (or, .00 cf. Ch.2)	.12	

Among the three forms, Adverbial, Irealis, and Conjunctive, the Adverbial is the closest to the infinitive in European languages, but we call all three 'infinitives' for convenience, since they are non-finite and cannot appear in the root clause (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 -te by Masanori 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. Thus, it seems clear that Japanese does not have root infinitives parallel to the Root Infinitive

TABLE 4.2. Frequency of root infinitives in pro-drop European Languages

Language	Child Name	Age	% of RI's
Italian (Guasti (1994))	Diana Martina	2;0 1;8-1;10	.00 .08
	Guglielmo	2;1 2;2	.16 .04
Italian (Schaeffer (1990))	Paola Daniele Massimo Gabriele Orietta Elisabet. Frances.	2;0-2;5 1;7-2;6 1;7-2;6 1;7-2;6 1;7-2;6 1;7-2;5 1;9-2;5	.07 .08 .06 .07 .05 .10 .05
Spanish (Grinstead (1994))	Damariz Juan	2;6-2;8 1;7-2;0 2;1-2;4	.05 .12 .10
Catalan (Torrens (1992))	Guillelm Martí	1;11-2;6 2;0-2;5	.03 .03

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

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

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 Grinstead (1994), Guasti (1994), Rizzi (1994) and Sano 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 Sano and Hyams (1994).

The cross-linguistic variation immediately suggests that the RI phenomenon is not driven only by maturation of UG 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.

4.2. Head and Adjoined Affixes

In this section, we will discuss the typology of affixes, which underlies the typology of RI's. We will propose that inflectional affixes are adjoined to V in RI languages and they head I in non-RI languages. This distinction can account for the typology of pro-drop phenomenon and the developmental facts of inflectional affixation, as we will see, hence it has some independent motivation.

It has been observed in Jaeggli and Hyams (1988), Jaeggli and Safir (1989) and Hyams (1986b, 1992b) in their discussions of the typology of children's null subjects and inflectional morphology, that languages may be divided into two groups, according to the well-formedness of the root of verbs as an independent word: languages in which the roots are well-formed words and those in which they are not.³ The observation seems

² See Grodzinsky (1984, 1990) for the same typology of breakdown of inflectional morphology in aphasic patients, which is reflected in the later studies in language acquisition under discussion.

to be meaningful, especially since morphology is the natural locus of parametric variation, though it has not been clear how this morphological difference is theoretically connected to the typological variation discussed by these authors. Below, we will try to develop the basic idea espoused in their works, keeping in mind the goal of explaining the RI phenomenon together with the pro-drop phenomenon.

4.2.1. Adjoined Affixes

Let us start by observing the morphological properties of inflectional affixes in each type of language. We will focus on finite affixes, 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 paradigms of tense and agreement.

(2) a. Dutch 'work'

Infinitive= werk-en, Root= werk-, Imperative= werk

present
1, s 2 3 s 1,2,3 pl
werk, werk-t, werk-en

past
1,2,3 s 1,2,3 pl
werk-te,
werk-ten.

(2) b. German "walk"

Infinitive= spazier-en, Root= spazier-, Imperative= spazier-(e)/spazier-en

present
1, s 2, s 3, s;2, pl 1,3 pl
spazier-(e), spazier-st, spazier-t, spazier-en

past
1,3 s 2, s 2, pl 1,3 pl
spazier-te, spazier-te-si, spazier-te-t, spazier-te-n

((e) is the omission of sound, not spelling)

c. French 'walk'

Infinitive= march-er, Root= march-, Imperative= march/march-ez

1,2,3 s;3 pl 1, pl 2, pl
march,
march-ons,
march-ez

past (participle)
(AUX +) march-é

d. English

Infinitive= walk, Root= walk-, Imperative= walk

present
1,2, s;1,2,3 pl

3, s
walk,
walk-s

past
all person/number
walk-ed

In each language in (2), the bare root functions as at least one form of agreement of the present tense. In other words, the undefined form in each language has a silent realization of the inflection of present tense/agreement. This is called a 'Morphologically Non-Uniform' paradigm in Jaeggli and Hyams (1988) and Jaeggli and Safiri (1989), in the sense that such a paradigm is the mixture of overt affixes and covert affixes. In

Hyams (1986b, 1992b), such languages have a [+I] 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 (2), 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 person/number agreement. The contrast between nonpast and past tense is expressed by the affixes -[a/e]r/-[a/e]de. The tense-inflectional paradigms of three of the Swedish verb classes are illustrated below, concentrating on cases minimally necessary for us.

(3) Swedish

Class I 'call'

Infinitive= kalla, Root= kall-/kalla-, Imperative= kalla

nonpast
kallar
kallade

Class II 'bend'

Infinitive= böja, Root= böj-, Imperative= böj

nonpast
böjer
böjde

Class III 'dwell'

Infinitive= bo, Root= bo-, Imperative= bo

nonpast
bor
bodde

(from Björkhagen (1956, p.120-127, p.141))

In the tense paradigm of nonpast/past, there is no null affix in Swedish.⁴ 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 European 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 pro-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 omission 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 omitted 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 omission is a noun or a preposition or even a non-existing hypothetical word, as long as the result is

⁴ 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 -a. 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., '-ru' to the consonantal verbs with /n/-final root, *sin-u* 'die', or '-ru' and -ta to the vocalic verbs, *mi-ru/mi-ta* 'see'; recall that Japanese syllables must end either with /n/ or with vowels), but they do not differ from other affixes with roots 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 translate this into terms in which V and I count as heads in adjunction (cf. Chomsky (1991)). We will first discuss the adjointed affix; the head affix will be discussed in the next subsection.

In the clausal structures with adjointed finite inflectional affixes, the affixes are adjointed to V and they are checked by raising the V, together with its affixes, to I, which is the projection of the T/AGR features, not of affixes. Thus, for the affixation of adjointed 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.

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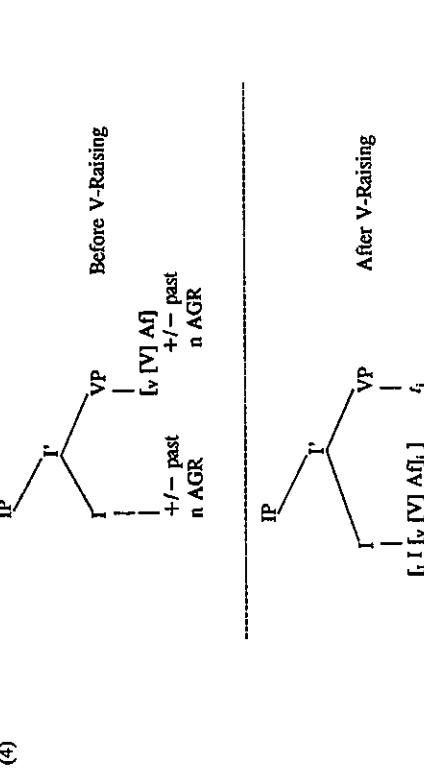
phonologically well-formed. This does not seem to be the case. For example, Japanese tense affixes attach to phonologically well-formed stems in some cases (e.g., '-ru' to the consonantal verbs with /n/-final root, *sin-u* 'die', or '-ru' and -ta to the vocalic verbs, *mi-ru/mi-ta* 'see'; recall that Japanese syllables must end either with /n/ or with vowels), but they do not differ from other affixes with roots 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 translate this into terms in which V and I count as heads in adjunction (cf. Chomsky (1991)). We will first discuss the adjointed affix; the head affix will be discussed in the next subsection.

In the clausal structures with adjointed finite inflectional affixes, the affixes are adjointed to V and they are checked by raising the V, together with its affixes, to I, which is the projection of the T/AGR features, not of affixes. Thus, for the affixation of adjointed 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.

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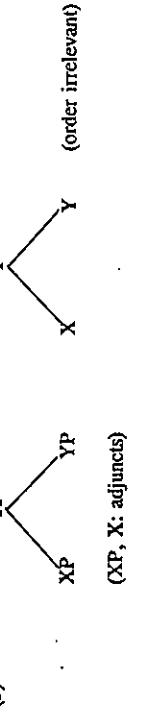
We avoid projecting null (adjoined) affixes, and rather license the checking of phonetically null items in paradigms by bare V's, in other words, by V's without non-matching affixes. Instead, we propose that the checking is bi-unique: features in I must be checked by appropriate verbs, with and without affixes depending on the feature values, and the affixes must also be checked against matching I-features. Then, for example, "*John walk*" 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 affix -s, and "**I 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 convention in the

specification (i.e., 1st person instead of 3rd). In contrast to the usual convention in the

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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.⁵ 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 adjointed affix is structurally the same as adjunct XP phrases in the usual sense. If an element (i.e., X or XP) combines with a projection Y(P) and results in the recursion of the same element, Y(P), then it is adjointed, as illustrated in (5).



There are two intrinsic properties of adjunction of interest to us: i) the projection to

⁵ This elimination of null affixation applies only to phonetically null realizations of some feature values in the finite inflectional paradigms (e.g., in English, agreement except 3rd person singular and nonpast tense). It does not eliminate the null affixation of features with semantic content, in particular, non-finite forms (e.g., the Irrealis and Adverbial forms of Japanese vocalic verbs). From a different perspective, the Irrealis and Adverbial null affixes of Japanese vocalic verbs are necessary to be consistent with the corresponding overt affixes of consonantal verbs. It is not obvious if this is motivated or has to be assumed. However, as long as children distinguish finiteness, as shown in Chapter 2 for the languages under consideration, including Japanese, it seems reasonable to claim that children do not adjoin finite affixes to non-finite verbs.

which adjunction applies must be independently well-formed, and ii) the projection created by adjunction must be the same as the projection to which adjunction occurs. We will call this latter property "Matching Requirement of Adjunction (MRA)" for convenience. Property (i) corresponds to the spirit of earlier proposals, Morphological-Uniformity and the Stem Parameter. We will argue that property (ii) neatly takes care of the problems of the earlier proposals, namely, how to incorporate Swedish and Japanese into the system. To be concrete, since adjunction of inflectional affixes must not change the categorial status of the whole projection from the category of the pre-adjunction structure, an inflectional affix cannot be adjointed when the root is well-formed as a projection distinct from the whole projection after adjunction. In particular, finite affixes cannot be adjointed to non-finite verbs, since it changes the finiteness of the projection after adjunction. The fact that the root is a well-formed word is only a necessary condition for an affix to be adjointed. The sufficient condition is: the root is well-formed as the 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 defining adjointed affixes. As long as null affixes are considered to be non-existent, as we claim, the status of an adjointed affix follows from the two general properties of adjunction we have discussed. Bearing this in mind, we state the definition of an adjointed affix as in (6), to make our discussion efficient.

- (6) **Adjoined Affixes:**
 An affix is an adjoined affix if it adjoins to a verb of the same specification for finiteness (and 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., AGR, finite T), of current concern to us, can only adjoin 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 (AGR, finite T) cannot be adjoined 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 adjoined to a non-finite projection. This point will prove advantageous in explaining 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 utilize this distinction in determining the status of affixes.

Now, let us see how our proposal works for the RI languages. When a paradigm has phonetically null realizations, as in the agreement paradigm of nonpast tense in the languages in (2) (f.c., Dutch, German, French, English), the finite affixes straightforwardly meet the requirement of being adjoined. For example, Dutch 2nd and 3rd person singular nonpast tense affix -t is an adjoined affix, because verbs appear without an overt affix for 1st person singular nonpast tense. In other words, since *werk*

⁶ I thank Matt Pearson for helping me with the details of Swedish grammar.

is finite, as well as *werk*, -t is recognized as an adjoined affix.

Since finite affixes cannot adjoin to non-verbs or non-finite verbs, due to the MRA, Japanese tense affixes are correctly excluded from the category of adjoined affixes. For example, the /n/-final root of the consonantal verbs can be a well-formed word, as *sin* 'root'(noun) in *sin-u* 'die', but it does not make the nonpast -*rju* an adjoined affix, because *sin* is not well-formed as a finite verb. Likewise, roots of the vocalic verbs are always well-formed as *non-finite Irrealis or Adverbial forms* (cf. Table 3.1 in Chapter 3), but again this does not make the tense affixes -*ru* and -*ta* qualify as adjoined affixes, because the roots of vocalic verbs are not well-formed as *finite verbs* (e.g., *mi-tru/mi-ta* 'see/saw' =finite, *ni* 'see' =non-finite Irrealis/Adverbial).

Now, notice that Swedish tense affixes can be correctly identified as adjoined 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 adjunction of finite affixes is motivated by verb-placement. In V2 languages, imperatives raise to the V2 position. In the case of Swedish, imperative verbs, as well as finite verbs or root clauses, precede NEG *inte*, while non-finite verbs follow it.⁶ Moreover, this treatment of Swedish does not wrongly include Japanese in the group of adjoined affixes, since Japanese verbal roots do not serve as imperatives.

⁶ I thank Matt Pearson for helping me with the details of Swedish grammar.

In this way, we have shown that the adjoined affix defined in terms of the general property of adjunction correctly partitions the inflectional affixes of RI languages and non-RI languages; affixes are adjoined in RI languages only. To recapitulate, in these languages, the omission of inflectional affixes does not affect the syntactic structure, hence such affixes are treated as adjoined affixes. Their structurally adjoined status will serve as the basis for licensing of RI's, as we will discuss later. Before that, let us discuss the other type of affix, the head affix.

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 adjuncts. In the case of European pro-drop languages, the verbal roots never appear as independent words. This is exemplified below for Italian and Spanish.

- (7) a. Italian 'live'
 Infinitive = abit-are, Root = *abit-, Imperative = abit-a-i
 1, s 2, s 3, s 1, pl 2, pl 3, pl
 abit-o, abit-i, abit-s, abit-iamo, abit-ate, abit-ando

Spanish 'speak'
 Infinitive = habl-ar, Root = *habl-, Imperative = habl-a/-ad/-e-er-en
 1, s 2, s 3, s 1, pl 2, pl 3, pl
 habl-o, habl-as, habl-a, habl-amos, habl-áis, habl-an
 (*: not well-formed word)

The difference between Italian/Spanish and other European languages can be captured by the previous proposals: the former is Morphologically-Uniform unlike the latter, or the former is [-bare stem] unlike the latter. Also, the agreement affixes of the nonpast tense in Italian and Spanish in (7) are clearly not adjoined, since the roots are not 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 consonantal verbs, which constitute the majority, the root usually does not appear as an independent word, as in Italian or Spanish, since Japanese syllables do not allow coda consonants except for /nf/. See (8a) below for examples. As mentioned earlier in the discussion of adjoined affixes, the /n/-final root can be a well-formed word (e.g., *sin* of *sin-u* '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 (i.e., Irrealis or Adverbial), as exemplified in (8b): the root of a vocalic verb, *mi-nu* 'see', is *mi*, and it is by itself Adverbial or Irrealis, that is, it is an independent word.

- (8) Japanese
- Consonantal Verbs 'enter'
Adverbial('Infinitive') = hair-i, Root = *hair-, Imperative = hair-e
nonpast past
hair-u, hair-ta
'write'

Adverbial('Infinitive') = kak-i, Root = *kak-, Imperative = kak-e
nonpast past
kak-u, kak-ta

b. Vocalic Verbs 'see'

Adverbial('Infinitive') = mi, Root = mi-, Imperative = mi-toi-yo
nonpast past
mi-ru, mi-ta
(*: not well-formed word)

Thus, Japanese verbal inflection is a mixture of the two systems, according to the criteria of the previous analyses we discussed: it is Morphologically-Uniform with respect to consonantal verbs and it is Non-Uniform with respect to vocalic verbs; or, it is [-bare stem] with consonantal verbs and [+bare stem] for vocalic verbs.

By defining head affixes as those that are not adjoined affixes, as in (9) below, we can classify Japanese and pro-drop European languages together, without being disturbed by Japanese vocalic verbs.

affixes quality as adjoined affixes.

To sum up so far, we have divided affixes into the two types based on their morpho-syntactic properties, as defined in (6) and (9). Given the dichotomy, there is a typology of inflectional affixes corresponding to the typology of RI phenomenon, as illustrated in (10).

(10)	Languages	T/AGR Affix	RI
non-pro-drop European languages (i.e., Dutch, German, French; Swedish; English)		T & AGR Adjoined	yes
pro-drop European languages (i.e., Italian, Spanish, Catalan) Japanese		AGR Head	no
		T Head	no

As evident in the chart above, the head/adjoined 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 adjoined affix, being adjoined on V, cannot. Thus, the connection between the null subject typology and the affix typology in the theory of Morphological-Uniformity is implemented within a theoretical 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.

(9) Head Affix:

An affix is a head if it does not adjoin to a verb of the same specification for finiteness (and other relevant features).

When the verbal root (or stem) is not a well-formed word, affixes cannot adjoin to it, because there is no base form for an affix to adjoin to.⁷ Hence, they are heads. Even when the root (or stem) is a well-formed word, affixes cannot adjoin to it unless they are verbs of the same finiteness specification. In particular, finite affixes (i.e., +/- past tense and AGR) cannot adjoin to verbs other than those which are specified as finite or to words of other categories. Since adjunction is restricted by general requirements of phrase-structure building, as we saw in the previous subsection, no stipulation is made for the distinction between head and adjoined affixes *per se*.

Specifically, Japanese bare verbal roots which are well-formed words do not mislead the language learner into taking Japanese tense affixes -ru/-ta as adjoined, if the definition in (9) is adopted. Although this point was already mentioned in discussing adjointed affixes, we can briefly see how it works here again. The consonantal root for sin-u 'die' is a well-formed noun or adjective, but not a finite verb, and the vocalic root, such as mi in mi-ru 'see', is not a well-formed finite verb, though it is well-formed as a non-finite form (cf. fn. 5 on affixation of the non-finite forms of vocalic verbs). Since finite affixes can adjoin to finite verbs only, these cases do not make the Japanese tense

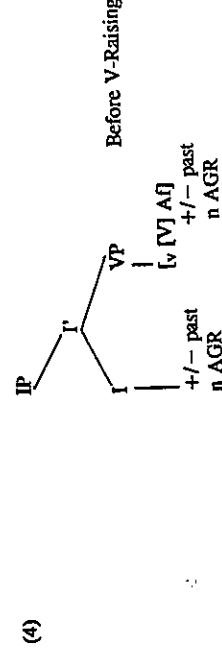
⁷ We are dealing with the inflectional affixation only. Derivational affixation is not within the scope of our present discussion.

4.3. The Analysis of Root Infinitives

We claim that RI's are licensed by the underspecification of (Inflexional)-features. The underspecification of I is possible only with adjoined inflectional affixes: adjoined affixes adjoin to V and undergo checking against I-features by V-to-I raising. Hence features in I need not be fully specified when the acquisition of features in adjoined affixes is not complete. In contrast, head affixes project as I by themselves, thus leaving no possibility for underspecified I-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 adjunction-affixation. Thus, 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. Adjoined Affixes, I-Feature Underspecification, and Root Infinitives

As is evident from the discussion of head/adjoined affixes, it is only the languages with adjoined I-affixes that display the RI phenomenon. As illustrated in (4), repeated below, adjoined affixes adjoin on V, and V+Af moves to I, which is a projection of T and AGR features.



In this way, in languages with adjoined inflectional affixes, I is a projection of features, not an overt category, and hence it is possible that I is underspecified in child languages. Before children become mature enough to be able to adjoin affixes obligatorily, the features in I do not obtain contrastive values. This is the answer to half of the typological question, that is, why RI's are found only in non-pro-drop European languages. It is because they have adjoined inflectional affixes and the I-features are underspecified, in a way compatible with RI's, at the early stage before maturation of adjunction-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 adjoined-affix languages, we adopt the T(ense)-value underspecification of Wexler (1994) and extend it by maturation of adjunction-affixation. Specifically, we propose underspecification and maturation as in (11).

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T-value underspecification; it is finite tense but it lacks specified values such as [+/- past].¹⁰ Thus, [α 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 proposed immaturity of adjunction-affixation). The raising of finite verbs to I is assumed to be triggered by finiteness, which is independent of specific tense-values, hence overt raising of finite verbs in child French, German, etc., is compatible with the α-underspecification of T (cf. Wexler (1994, p.338)). The [α tense] feature is different from [Ø tense], which means that T is non-existent.¹¹ This allows our theory of underspecification to reserve the landing site for raising of finite verbs.

To compare with Wexler (1994), we agree with him that T is underspecified with respect to specific tense values, but we argue that it is adjunction-affixation, not the T values, that matures. This explains the cross-linguistic difference in the development of T values, in particular, the difference between adjoined affix languages and Japanese, which exhibit the nonpast/past distinction from very early on (cf. section 2.2.2). If T respects to the temporal interpretation, we follow Rooryck (1994) on the difference between Ø- and α-underspecification.

¹⁰ As for the interpretation, essentially following the line of Hyams (1994) and Hoekstra and Hyams (1995), apart from technical points, we assume that the [α tense] feature receives its interpretation deictically, while [+/- past] is a variable and is interpreted by being bound by an operator (cf. Guérin and Hoekstra (1994)). Depending on the context, [α tense] may result in a [-past], [+past], or other finite tense interpretation, and hence at LF, child languages are the same as adult languages with respect to the temporal interpretation.

¹¹ We follow Rooryck (1994) on the difference between Ø- and α-underspecification.

- (11) a. The tense feature in I is underspecified as [α tense] and the person agreement feature in I is underspecified as [\emptyset person].⁸

- b. Adjunction of affixes matures: it is not obligatory at first and becomes obligatory by maturation later in development.⁹

- c. Features in I arrive at a contrastive specification, [+/- past] and [n person] when the adjunction of affixes matures.

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

At the initial state, I is [α tense, \emptyset person], and it is compatible with both infinitives and finite verbs. The [α tense] notation is one implementation of Wexler's infinitives and finite verbs. The correlation is reported on the number feature correlates with the demise of RI's or not. In the case of the person feature, the correlation is reported in child German, as we will see.

⁸ We do not discuss 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 the case of the person feature, the correlation is reported in child German, as we will see.

⁹ We assume that (optionally) adjoined affixes, before the maturation of complete adjunction-affixation, do not require checking against features in I, because they do not have contrastive features of tense and agreement. Though they may have the 3rd person feature, for example, it is not the same as the adults' which is contrasted against 1st and 2nd persons. An alternative is to assume that the feature specification in I 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 I, we choose the first option. See section 4.5 on theoretical comparison of optional and non-optimal underspecification. Incidentally, it perhaps generally holds that the maturation of some linguistic capacity refers to 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 sense, our postulation of maturation of adjunction-affixation, from optional to obligatory, is not peculiar.

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itself matures, it remains unexplained why Japanese does not exhibit the developmental delay of tense acquisition (cf. also Guilfoyle and Noonan (1988), Grinstead (1994), on T maturation).

One empirical prediction of our proposals for T is that past tense forms are missing at the RI stage. Due to the valueless status of T before maturation of adjunction-affixation, it is predicted that children have a command of only the finite form without overt affixes of tense specification. In the case of RI languages, this form is the nonpast form, which lacks overt marking for nonpast tense, as noted in Hoekstra and Hyams (1995). The empirical data supporting this claim — the late emergence of past forms in the languages with adjoined past tense affixes — may be found in the following:

English (cf. Brown (1973), Radford (1990), etc.), German (cf. Poepel and Wexler (1993), Mills (1985, p.170-171)).¹²

Another aspect of underspecification in (11) is that the person feature, henceforth AGR-feature, is underspecified as [\emptyset] in I. This literally means that it does not exist initially. In this respect, our proposal follows H. Clahsen's claim for child German that finiteness exists but agreement does not (cf. Clahsen (1990), Clahsen and Penke (1992), Clahsen et al. (1994), etc.). AGR in I remains [\emptyset] until adjunction-affixation matures

¹² Languages with compound tenses, 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 direct predictions for such cases. For the development of past tense in these languages, see Pizzuto and Caselli (1992) for Italian and Clark (1985, p. 723) for French.

and AGR obtains contrastive 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 [Ø] initially does not have any interpretive outcome, because it only plays the role of mediating the AGR-features in the subject NP and the verb (cf. Chomsky (1993, p.30)). The AGR-feature 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 finiteness 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 [Ø] without any consequences at LF.

Given this consideration of AGR in I as a mere mediator, the empirical prediction of the Ø-underspecification 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. Guasti (1994), Grinstead (1994)), we predict that children at the RI stage can use agreement affixes correctly but only optionally: they have an adult-like distinction of person and hence do not use wrong affixal forms, but they may not adjoin the agreement affix because adjunction-affixation is optional before maturation (cf. (11b)) and there is no AGR feature in I which requires the raising of the correct agreeing form (cf. (11a)). 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.214-216), Clahsen and Penke (1992), Clahsen et al. (1994), Poeppel and Wester (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 adjointed affixes, as well as the RI, is licensed by the Ø-underspecification of AGR, and yet the adjoined affix may not be randomly used because it must agree with the AGR-feature of the subject NP when it is raised together with a verb. In this way, the 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 contrastive values. This shift concerning the I-feature specification is triggered by the maturation of adjunction-affixation (cf. (11c)). This is the maturation of morphological operation, not of UG principles: at some point in development, children become mature enough to be able to adjoin affixes obligatorily, and before this, adjunction-affixation is optional. When adjunction-affixation becomes obligatory, children do not omit adjoined affixes anymore in receiving input sentences from adults, and consequently they can acquire the contrastive values of T/AGR features. Given the contrastive values, T and AGR are independent entities in the lexicon, which may project as I in the clausal structure. The specified feature values, [+/- past] of T and [i person] of AGR, require raising of verbs with features of corresponding values,

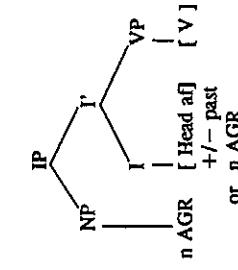
namely, finite verbs with appropriate affixes. Then, RI's become impossible because infinitives have neither [+/- past] nor [i person].

Under the analysis presented, the shift to the no RI stage takes place when one of the T or AGR features is specified in I by maturation. Therefore, empirical predictions are made concerning the developmental correlation between the acquisition of the feature-values of T/AGR and the demise of RI's. This is supported by the correlation of the completion of the person paradigm (specifically, by acquisition of 2nd person singular -st) and the sudden decrease of root infinitives in German, noted in Hoekstra and Hyams (1995) (cf. Clahsen et al. (1994), Duffield (1992)). The prediction of a developmental correlation seems to be compatible with the facts of tense, too, in that the productive use of past forms is delayed for some period, as noted in the discussion of the RI stage. Thus, our predictions seem to be empirically sound, pending further evidence from future work.¹³

4.3.2. Head Affixes, no I-Feature Underspecification, and no Root Infinitives

Head affixes project as heads and never adjoin 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 spirit of Lasnik (1994) and Rohrbacher (1994), who account for certain parametric variation by claiming that affixes may head I or adjoin 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 adjoined-affix languages and affixation by V-to-I adjunction raising in Chomsky (1991) 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 clausal projection with a head affix is illustrated below.



¹³ It is noted in Sano and Hyams (1994) that null subjects in child English cooccur with the past tense affix -ed 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 occurrence may not be compatible with the current analysis of RI's, which is based on T-underspecification, in particular. One speculative compromise is to claim that -ed is an aspectual marker in child English, hence non-finite, as proposed in Sano and Hyams (1994), restricting children's misanalysis of this kind only to LF-raising affixes.

projection of a particular form of verb as its complement, and thus is compatible with adjunction of the particularly selected forms only.¹⁴ As long as all I-affixes are heads, no RI's are allowed.

To make it explicit that the lack of I-underspecification 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 to I.

The presupposition of this reasoning is that checking occurs only for adjoined affixes, which is valid. The crucial point for our discussion is whether a head affix can be adjoined to V by mistake. This is impossible under our theoretical assumption that adjunction 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 adjoined on V, is projected in head-affix languages. In this way, from our theoretical distinction of head vs. adjoined 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.¹⁵

¹⁴ Elaborating on the structure in (12), the overt raising of V-to-I in languages with head affixes is triggered by the Stray Affix Filter in Lasnik (1981). If V does not raise, the head affix will be Spelled-Out by itself, violating the filter. This makes an empirical prediction: all head-affix languages have overt V-to-I raising.

¹⁵ Two more details may be worth discussing. 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

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

- (13) Continuous Head Affix Placement (CHAP):
Head affixes continuously project as I.
(Corollary: Adjoined affixes continuously adjoin to V, cf. fn. 15)

Without this principle, even when head affixes are correctly identified as heads, RI's may be overgenerated, because the head affix can in principle project as a head of V, leaving the I position underspecified and hence incompatible with RI's. CHAP is structurally very close to CAP, Continuous AUX-Placement, in that both principles state that a sequence (in the case of CAP, the selection of V by AUX, and in the case of CHAP, the selection of a stem by a head affix) always projects as an I-V sequence (but not V-V) throughout language development. We will discuss these two developmental generalizations at the end of this chapter.

discussion, Italian, Spanish and Japanese, the infinitival affixes do not adjoin to well-formed verbs, hence they are heads, except for, possibly, the "null affixes" of the Irrealis and Adverbial forms of Japanese, vocalic verbs.

Second, what about the possibility of the other mistake made by children, that is, treating an adjunct affix as a 'head'? While this may not be excluded on theoretical grounds, it is not obvious. We stipulate that adjunction onto an element is less costly than projecting two elements and, consequently, children try to adjoin as much as they can.

To summarize, the typological difference with respect to RI's in child languages follows from the proposed theory of the underspecification of I-features, maturation of adjunction-affiliation, and the projection of two kinds of affixes, which is continuous throughout development, as stated in the form of CHAP.

4.4. Comparisons with Other Accounts

Let us compare our accounts with some previous analyses of the RI phenomenon, namely Rizzi (1994), Wexler (1994), and Hoekstra and Hyams (1995). It is not easy to determine which account is better, since details of the phenomenon 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. Wexler (1994)

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

In one proposal, Wexler derives the optionality of finite/non-finite forms by pointing out the following derivational consideration, adopting 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 (1991). 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 (1993), which abandons lowering and adopts LF-raising instead. Still, the cause of the optionality is the lack of T values. He claims that root infinitives are finite forms with a Weak-AGR feature, which occupies V overtly and raises to I at LF, while finite verbs bear a Strong-AGR feature, which overtly raises to I. This is possible only when T lacks its value, he argues.

Wexler does not discuss the typological variation of RI's, since there was no consensus on whether the optional root infinitives were universal or not (cf. fn. 53 of Wexler (1994)). At any rate, the T value development by itself cannot explain the variation. Our proposal can be viewed as an extension of Wexler's analysis, which also accounts for the typological variation.

4.4.2. Rizzi (1994)

Rizzi (1994) claims that the source of the phenomenon is the maturation of an axiom in UG which requires root clauses to be CP. Before this matures, any phrasal projections, AGR-s, TP, VP, etc., can be root clauses. 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 in adult languages, but bare VP's do not require tense interpretation, presumably like nouns, and hence are licit. The claim that the "Root=CP" axiom matures is less restrictive than proposals which do not invoke the maturation of UG principles or axioms, because it cannot explain the developmental correlation of the demise of the RI and the acquisition of some functional elements. For example, the acquisition of 2nd person singular agreement in German reported in Clahsen et al. (1994) correlates with the demise of RI's, as we discussed earlier, but it remains unexplained by Rizzi's account. It may be possible to claim that after the acquisition of AGR, the clause must project up to AGR, though not to 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. Rizzi's account of Italian is different, as we will point out directly.

Concerning typological variation, Rizzi explains why root infinitives are extremely rare in Italian acquisition. Adopting Belletti (1990)'s analysis that Italian infinitives raise to AGR-s, just like finite verbs, which is based on the distribution of V with respect to a negative adverbial element *più*, Rizzi derives the lack of root infinitives in Italian by

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arguing that Italian infinitives raise to AGR-s in child languages as well, and that inevitably creates 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. Rizzi himself offers some speculations on this point (cf. fn. 8 of Rizzi (1994)). As he states, raising over *più* is unlikely to serve as the trigger, considering that it is scarce in the input data. The other question is how his account may be extended to other non RI languages, in particular Japanese. Japanese, due to the strictly V-final character, lacks an overt indication of the raised position of verbs. That is, verbs do not exhibit overtly distinctive placement contingent on finiteness, unlike in French or V2 languages, and hence there is no direct structural indication of how high Japanese infinitives raise.¹⁶ Thus, Rizzi's account of Italian does not appear to extend to Japanese straightforwardly.

¹⁶ However, it is interesting that Japanese nominative case-marker *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 nominative 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.

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4.4.3. Hoekstra and Hyams (1995)

In Hoekstra and Hyams (1995), RI's are argued to be the result of underspecification of the Number feature in functional projections. It is an optional Ø-underspecification: children know of the existence of Number in clausal projections, but they specify its value only optionally. When it is left unspecified, children produce RI's because the chain from T to C(omp), which is necessary for tense interpretation under the theory they assume (cf. Guéron and Hoekstra (1994)), is broken and the tense variable is interpreted deictically. That is, finite forms are required when T is bound by an operator in C and interpreted as a bound variable, but RI's result if T is left unbound and interpreted deictically.

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 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 should be 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 nonpast 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 (1989)) or which may be so misanalyzed (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 misanalyzed. Their proposal is arguably more restrictive in that it restricts underspecification to one feature only — number. However, because they allow the possibility of misanalysis for German and French, the theory calls for some additional assumptions. For German, they argue that children at first misanalyze the 3rd person singular -t as the singular affix, not 3rd person. For French, they argue that children fail to notice person 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 Hoekstra and Hyams requires that children learning French posit a null singular affix, optionally, when they filter out plurals by 'avoid plural': when the null singular affix is missing, the RI appears, and when it is there, finite verbs are chosen. It may be too powerful to posit such an optional null element, since its existence cannot be identified in any overt way.

Swedish could pose another problem. Hoekstra and Hyams claim that tense may not be underspecified, 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 Hoekstra and Hyams (1995)), in spite of the fact that Swedish allows RI's, it has overt marking of the nonpast/past contrast. This is incompatible with the position that tense may not be underspecified at all. They speculate that the Swedish nonpast affix may not represent nonpast, given that fact that it does not appear for nonpast s-passives. This

analysis may be correct, but a question remains: how can children tell that the Japanese tense affix is tense but the Swedish one is not? This is not easy to handle empirically because the crucial construction, the *s*-passive, is not acquired at the relevant early stage. No *s*-passive is observed before 2;4-2;6 at least, according to Plunkett and Strohmqvist (1992, p.531).

4.5. Underspecification and the Subset Problem: A Theoretical Issue

In this section, we address a theoretical issue related to underspecification, that is, the Subset Problem of underspecification. As we have discussed, it is necessary to postulate some underspecification to explain the RI phenomenon in certain child languages. Specifically, we argued that I-features are underspecified as [α tense, \emptyset person] in child languages with adjoined inflectional affixes.

An alternative theory of underspecification, suggested in Hookstra and Hyams (1995) for example, is to allow the two options in child languages, that is, the option with complete \emptyset -underspecification and the option with the adult-like full specification. In other words, child languages include their own \emptyset -underspecified grammar and the adult-like grammar. We call this Optional Underspecification.

Though Optional Underspecification may be able to describe the child languages with RI's and the adult-like finiteness 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

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are in a subset relation, no positive evidence can trigger a shift from the grammar of the superset language to the grammar of the subset language, because all evidence from the target, the subset language, is compatible with the grammar of the superset (cf. Angluin (1978), Berwick (1985), Wexler and Manzini (1987)). We call this the Subset Problem. In contrast, when the features in I are underspecified without optionality, as in our proposal or in Wexler (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-raising in RI languages at the same time. The T-features must be underspecified for the sake of RI's, while they need to be specified in an adult-like way for the sake of V-raising. Our compromise was the underspecification [α T, \emptyset AGR]. The case in point in the current discussion is [α T]. It is without specific values, such as [+ past] or [- past], and interpreted deictically, hence it is compatible with RI's. This treatment leads us to take the position that V-raising of finite verbs is not for the sake of checking T-features; otherwise, we end up with a completely arbitrary stipulation that both finite and non-finite verbs have T-features as [α T]. Thus, we adopted Wexler's position that V-raising is for the sake of finiteness, not for the checking of T-features. The burden of such a theory is to clarify the nature of raising for finiteness, especially regarding how it is independent from T-values. In the Optional Underspecification theory, however, this is unnecessary, since it analyzes T as fully-specified when finite verbs are chosen and

undergo V-raising.¹⁷

In this way, there are theoretical difficulties for both approaches at this juncture. It would seem unreasonable to opt for one of the two approaches based on only these theoretical points. As a matter of fact, the head vs. adjoined dichotomy, the core of our proposal, can be implemented under Optional Underspecification 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, in analyzing negation errors in child Japanese, we arrived at the conclusion that Japanese NEG *nai*, 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 named this phenomenon CAP and defined it as below.

(14) Continuous AUX-Placement (CAP):

The AUX-elements, namely, verbal elements which may cooccur 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: Adjoined 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 adjoined 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. Thus, 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 relations. Then, CAP and CHAP both indicate that such sequences are

¹⁷ It is possible that V-raising is triggered by finiteness, independently of the T-feature, even in the Optional Underspecification theory. The difference is that V-raising in child languages cannot be triggered by the T-feature in our proposal or in Wexler's.

always projected as I-V, not as 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) John [I [may] [v have] [v been] tired.]
(at Spell-Out)
John [I [v has] [v been] tired.]
(at Spell-Out)
- (16) John [I [I [v has] [v been] tired.]
(before Spell-Out)
John [I [v has] [v, t] [v, been] tired.]
(at Spell-Out; = (16))
- (17) a. John [I [v has] [v, been] tired.]
b. John [I [v has] [v, t] [v, been] tired.]

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 *avoir eu* is projected as V-V, that is, to the right of NEG *pas*.

- (18) Ne pas avoir eu d'enfance heureuse est une condition pour écrire des romans.
'Ne not to have had a happy child is a prerequisite for writing novels.'
from Pollock (1989, p.373)

¹⁸ It may be C-I-V for V2 languages, but, for the sake of simplicity, we do not make this distinction.

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 mention one which has empirical consequences, head affixes are AUX. From this, we may be able to derive some differences between head affixes and adjoined affixes. For example, Japanese tense affixes would be identified as AUX, unlike English tense affixes. This can be the basis for explaining the difference in tense interpretation between Japanese and English, discussed in Ogihara (1989), Stowell (1992) and Nakamura (1995). Discussed in these works is 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 byooki dat-ta to] omot-ta (koto)
nom
'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 *was*. 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 affix is morphologically AUX (cf. Shibatani (1990)), as discussed in Chapter 3. For example, *data* consists of the Adverbial form *de ar-i* and AUX *-ta*, morphologically. Thus, there is support for the unified treatment of CAP and CHAP in Japanese temporal interpretation and in 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 holds in External Negation and the lack of RI's of AUX-elements, according to our analysis.

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?¹⁹ 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 adjoined affix(es)) 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 in a top-down way continuously throughout

One consequence of this formulation is that infinitival AUX, which is presumed to be in V (cf. (18)) at Spell-Out, projects after the projection of infinitival feature in I.²⁰ Now, why a top-down projection? 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 UG syntax whether chain-formation is attraction (top-down) or movement (bottom-up). Continuums defined here and chains in UG syntax are the same in the sense 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 Chomsky (1995).

¹⁹ 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 starts 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 in a bottom-up way later in the derivation.

²⁰ To give another perspective for clarification, this essentially means that the infinitival AUX undergoes "lowering" if we put it into the framework of Chomsky (1991).

Though 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 immaturity of morphology, namely, adjunction-affixation, which is specific to the type of affixes (i.e., adjoined affixes) of RI languages, and which makes the features in I 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 stem 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, that is, whether an affix heads a projection or adjoins to another projection. We developed the idea of earlier works based on the morpho-syntactic facts of Japanese and Swedish and theoretical properties of adjunction. The proposed division can theoretically account for the typology of null subjects in adult languages. In section 4.3, based on this morphological distinction, we proposed for adjoined-affix languages that: i) I-features are underspecified initially as [α T, Ø AGR],

which is compatible with RI's, and ii) adjunction-affixation undergoes maturation. Consequently, RI's are possible only in adjoined-affix languages, and after maturation of adjunction-affixation, the I-features acquire contrastive values, and RI's are disallowed even in adjoined-affix languages. The head-affix cannot be mistakenly adjoined and thus the typology of RI's was derived, by proposing that head affix continuously projects as I, not V, by a principle which was named CHAP. In section 4.4, we reviewed other proposals on RI's in Rizzi (1994), Wexler (1994), and Hoekstra and Hyams (1995).

In section 4.5, we discussed a theoretical issue of underspecification concerning the subset principle and raising of finite verbs. In section 4.6, we made a final remark, speculating on the possibility of unifying 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-Constrained Maturation" in his terminology). We leave concrete discussions of this theoretical issue for future research.

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