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THE ACQUISITION OF PARAMETERIZED GRAMMARS

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THE ACQUISITION OF PARAMETERIZED GRAMMARS

by

NINA MOSS HYAMS


A dissertation submitted to the Graduate Faculty
in Linguistics in partial fulfillment of the
requirements for the degree of Doctor of Philosophy,
The City University of New York.

1983

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This manuscript has been read and accepted for the Graduate Faculty in Linguistics in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

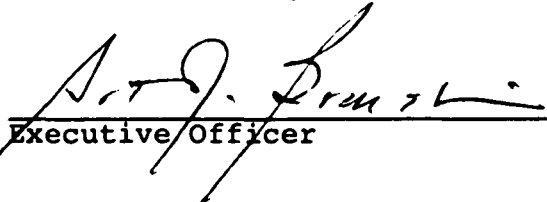
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ABSTRACT

THE ACQUISITION OF PARAMETERIZED GRAMMARS

by

Nina Moss Hyams

Advisors: Professors Helen Cairns and Robert Fiengo

This study investigates syntactic development in young children within the framework of the Government-Binding Theory of grammar (cf. Chomsky, 1981).

Within Government-Binding Theory, Universal Grammar (UG) is formulated as a system of principles and parameters, where the parameters express the limited range of possible variation associated with each principle. In a parameterized theory of grammar, the task of the language learner is to "fix" the parameters of UG at the values which are correct for the particular language he is acquiring. The choice of one or another of the set of predetermined values may have complex consequences resulting in languages which appear to be quite diverse.

A parameterized theory of grammar raises the empirical possibility that an early grammar of a particular language may differ from the adult grammar with respect to the values specified for particular parameters. The

"missetting" in the early grammar results in a language which varies in systematic ways from the adult language.

In this thesis, it is argued that the early grammar of English differs from the adult grammar with respect to the value specified along a particular parameter of UG, the AG/PRO parameter (a version of the Pro-Drop Parameter). This difference between the two grammars accounts for many of the salient properties of early English which distinguish it from the adult language, for example, the optionality of lexical subjects and the absence of modals and auxiliaries. Also considered is the process of "restructuring" by which the early grammar comes to resemble the adult system.

The effects of the AG/PRO parameter on the early grammar of German are also briefly considered, and the early grammar of Italian is examined vis-a-vis the AG/PRO parameter and two other parameterized principles of UG.

Central to this study is the hypothesis that grammatical development is a "continuous" process in the sense that each of the intermediate grammars falls within well-defined limits, as specified by the theory of grammar. Alternative "discontinuous" models of development (i.e., "semantically-based" child grammars) are discussed. They are shown to be empirically inadequate as a characterization of the child's linguistic competence during the early stages of acquisition, and conceptually problematic when viewed from a broader developmental perspective.

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CHAPTER ONE

LINGUISTIC THEORY AND SYNTACTIC DEVELOPMENT

1. Introduction

The process commonly referred to as "language acquisition" involves the development of a great number of cognitive systems and social skills. For example, the child must learn the form and meaning of the individual lexical items which comprise the lexicon of his language. He must develop a processing system which will enable him to produce and comprehend the sentences of the language in real time; this processing system will depend, in part at least, on a growing memory and attentional span. He will also acquire a set of pragmatic and social skills which allow him to use his language appropriately in various contexts. Finally, he must uncover the system of rules--morphological, phonological, syntactic, and semantic--which comprise the grammar of the language he is to acquire.

The ultimate goal of a theory of acquisition is to explain how the child acquires mastery of his native language. This explanation presupposes an understanding of each of the developing systems and their interaction. Such a comprehensive theory, no doubt a long way off, may

also provide a satisfactory account of a large part of the observable language behavior of young children. It is not our intent here to speculate on what such a theory might look like. Rather, we wish to limit our attention to one of the developing systems--the syntactic component of the grammar. We hope in this way to contribute to the much larger enterprise of constructing a general theory of language acquisition.

In studying syntactic development, we have two related concerns. On the one hand, we wish to describe, in a principled fashion, the grammatical knowledge possessed by the child at various points of development. In this respect, we depart from "normal" grammatical investigation, which typically seeks to describe the knowledge attained by the adult speaker/hearer. The second concern, however, is one which we share with linguistic theory--that of explaining how a child arrives at an adult grammar.

Our study of syntactic development proceeds within the framework of the theory of generative grammar, in particular, the Government-Binding Theory (cf. Chomsky (1981) and references cited therein). Within this theory, grammatical development is viewed as an "interactive" process; that is, the principles of Universal Grammar (UG), which constitute the child's a priori knowledge concerning the form of grammar, interact with the data of the child's linguistic environment to determine a particular adult

grammar. The fundamental question which arises within this framework is which aspects of linguistic structure are "given" and which aspects must be "learned" on the basis of exposure to a particular language. Linguistic theory attempts to answer this question by investigating the properties of adult grammars. Where a particular principle or rule either (a) operates across languages, and/or (b) is sufficiently removed from the data so as to be inaccessible to the language learner, it is assumed that the principle has universal status, and as such constitutes part of the child's a priori endowment. When, on the other hand, one finds variation across languages with respect to a particular phenomenon, word-order, for example, it is reasonable to assume that this aspect of linguistic structure is determined by the child on the basis of exposure to a particular language. The goal of linguistic theory is, therefore, to uncover those universal principles which constrain the class of attainable grammars and thereby make language acquisition (or, more narrowly, grammatical development) possible in principle. This approach to the acquisition question is sometimes referred to as 'the logical problem of language acquisition' (Hornstein & Lightfoot, 1981).

In addressing the 'logical problem of acquisition' it has proved useful to idealize to an "instantaneous model of language acquisition" (Chomsky, 1965). The

implicit claim of those who work under this idealization is that significant insight into the properties of UG can be attained by investigating only the end point in the acquisition process--the adult grammar. In our study of the intermediate (or child) grammars, we (naturally) abandon this idealization. Our goal is to show that the principles of UG are relevant in the analysis of the intermediate grammars, and that investigation of the intermediate grammars can provide empirical support for particular principles of UG. More to the point, if UG is a specification of the notion "possible human grammar," then it constitutes an empirical hypothesis about the structure of child grammars, insofar as the latter are also products of the human language faculty.

Henceforth, we use the expressions "child grammars" and "intermediate grammars" to refer to the set of grammars which characterize the child's linguistic competence up to the point at which he can be said to share (in large measure) the grammar of the adult speakers of his language community.¹ We view grammatical development, one aspect of language acquisition, as a set of successive grammars $G_0, G_1, \dots, G_n, G_s$, where G_s is the adult grammar or "steady state" (Chomsky, 1975). G_0 , the "initial state" (alternatively, Universal Grammar), is a set of principles which constitute the child's a priori knowledge of the structure of human grammars--knowledge which the child

brings to bear on the task of uncovering the grammar of the particular language to which he is exposed.

2. A Parameterized Theory of UG

The form of Universal Grammar is an empirical question, and theories of UG must meet certain conditions of adequacy. On the one hand, the system must be restrictive enough to account for the fact that the child arrives at a particular grammar which is vastly underdetermined by the available evidence.² At the same time, UG must be sufficiently open to allow for the range of possible human languages.

Within recent theories of grammar (Chomsky, 1980, 1981) UG has taken the form of a parameterized system. That is to say, it contains a set of principles and operations which hold universally, for example, \bar{X} Theory, which determines the form of the phrase structure component (Chomsky, 1970; Jackendoff, 1977), or 'Move α ' (the single transformational operation). In addition, each of these principles has associated with it a set of possible values; these values express the limited range within which grammars may vary with respect to each principle and operation. For example, \bar{X} theory specifies that all phrases are endocentric or 'headed' (Stowell, 1981). The position of the head within its phrase, however, may vary

from language to language. Thus, English is a 'head first' language; verbs and prepositions precede their objects. An SOV language, for example, German, is 'head last'; the verb follows the object within VP. The parameter specifies the range of possible variation. Similarly, the rule 'Move α ' is subject to parametric variation. For example, the categories over which α ranges may be different for different languages, NP, PP, VP, etc. It is conceivable that a language allows movement of one or more of these categories, but perhaps not all. Languages may also differ with respect to the linguistic level at which 'Move α ' applies. In English, the rule applies in the syntax. For example, it may move a wh-word to sentence initial position. In Chinese, in contrast, 'Move α ', where α = wh-element, does not apply in the syntax; wh-words remain in situ. Examples are given below.

- (1) a. Who_i do you like [e_i]
b. Ni xihuan shei
'You like who'

Huang (1982) points out that the interpretation of the Chinese interrogatives (direct and indirect) is identical to their English counterparts. The explanation for this is that in Chinese, wh-movement (an instantiation of 'Move α ') applies at the level of Logical Form. Hence,

at the level of Logical Form (LF), the wh-element (in both English and Chinese) appears in sentence initial position, and the structures are converted into a quantifier-variable representation of the form of (2) (Chomsky, 1976).

(2) For which x , x a person, you like x

Thus, English and Chinese differ minimally in that in the latter language 'Move α ', α = wh-element, is restricted to the level of LF. The two languages do not differ with respect to their representations at LF. (See Huang (1982) for discussion.)

The formulation of UG as a system of parameters implies a particular view of the acquisition process. In particular it makes a strong claim about the role played by the input data. At the initial state, the child is endowed with a set of universal principles, each of which has a predetermined set of possible values. In order to arrive at the adult grammar, the child must "fix" each of the parameters at the value which is correct for his language. Various material in the input data will act as "triggers" to fix the parameters at one or another of the predetermined values.³ The child acquiring English, for example, must determine that English is a 'head first' language, i.e., the verb precedes the object in VP. The evidence necessary for the child to determine this order is

readily available in the linguistic environment. He will hear 'John hit the ball,' but not 'John the ball hit.' Given the accessibility of this information, we expect that word-order related parameters will be "fixed" relatively early in development. Brown (1973), in fact, notes that word-order is one of the earliest aspects of syntax which the child controls. Similarly, for the case of 'Move α ,' the English-speaking child will hear sentences with initial wh-words. These sentences may provide sufficient evidence that 'Move α ' applies in the syntax. In Chinese, of course, no such evidence is forthcoming.

With regard to LF movement, the situation is somewhat different. The language learner has little direct evidence bearing on the character of the rules and representations of Logical Form. It is reasonable to suppose, therefore, that the properties of LF are, by and large, given a priori. The fact that Chinese and English, two languages with quite different surface syntactic properties, do not differ at LF provides empirical support for this hypothesis.

If the system of parameters is embedded in a theory,⁴ with rich deductive structure, then the choice of one or another of the possible values for a particular parameter, will have complex and varying consequences in different parts of the grammar. Thus, on the basis of limited

evidence ("triggering" data) very different grammatical systems can be constructed.

A parameterized theory of grammar makes certain empirical predictions about the shape of the intermediate grammars. One obvious prediction is that these grammars, though perhaps not fully specified, will not fall outside the limits imposed by UG. That is to say that if the values associated with a parameter P are $X_1 \dots X_n$, the early grammar will assume a value X_j , for $n > j > i$ for the parameter P . There has been much interesting experimental work attempting to test the hypothesis that the early grammars do not violate universal constraints (Matthei, 1978; Otsu, 1981; Phinney, 1981, among others). A second prediction, given the range of variation defined by each parameter, is that the early grammar of a language L may differ from the adult grammar of L with respect to the value specified for a particular parameter, provided that the value chosen falls within the permitted range. For example, it is possible that an early grammar of English assumes the value X_i for a parameter P , while the adult grammar of English is specified as X_j for P . The early grammar is thus a "possible" grammar, though it is distinct from the adult grammar.

In this study, we are primarily concerned with the second empirical possibility just noted, that is, where the early grammar differs from the adult grammar with

respect to a particular parameter. In Chapter Two we will examine a specific parameter of UG--the AG/PRO parameter (a version of the Pro-drop Parameter--cf. Chomsky, 1981). In Chapter Three we show that the grammar of young English-speaking children differs from the adult grammar of English with respect to the value chosen for this parameter, and that this difference accounts for many of the salient properties of early English, for example, the optionality of lexical subjects and the absence of modals and auxiliaries. The variation exhibited by early and adult grammars with respect to the AG/PRO parameter also explains a particular word-order "mistake" in the language of young German children, and other previously unexplained aspects of early language. We will also consider a second (morphological) parameter. The range of variation associated with this parameter accounts for certain differences in the inflectional properties of early English and early Italian.

A parameterized theory of grammar predicts that the successive grammars of a language may differ from one another as they may differ from the adult grammar of the language. The variation, however, falls within narrow limits, as defined by the theory of grammar. As noted by Lidia White (1980) this view implies a very indirect relationship between the child grammars of L and the adult grammar of L. We expect many similarities insofar as the data described by the child grammar intersect with the

data described by the adult grammar. However, the child acquiring English, for example, does not have teleological knowledge of the adult grammar of English, and thus, the latter is not the "target" in any coherent sense of that word. Rather, from the child's perspective the goal is to "fix" the parameters of UG in a manner which is consistent with the data at hand.⁵ As we will see, in certain respects the early grammars of English and German, for example, more closely resemble the adult grammar of languages like Italian and Spanish than they do the adult grammars of English and German.

3. Discontinuous Models of Development: 'Semantically-based' Child Grammars

In this study, we focus on the relationship between the principles of UG (the parameters) and the intermediate grammars. On our analysis, grammatical development is a "continuous" process (Keil, 1982; Gleitman and Wanner, 1982). It is "continuous" in the sense that each of intermediate grammars is constrained by the same set of universal principles, as defined by the theory of grammar. This is not to say that grammars do not restructure during the course of acquisition. Rather, on a continuous model, the restructuring which one expects is within narrowly defined limits.

An alternative view of grammatical development, and one which is assumed (either implicitly or explicitly) in much recent work in acquisition, is that it is a strongly "discontinuous" process. On a discontinuous model, child grammars are organized along principles which are fundamentally different from those which characterize adult grammars. The 'semantically-based' grammars proposed by Schlesinger (1971), Bowerman (1973), and Braine (1976) are illustrative of such an approach.

The semantically-based theories argue, in essence, that the early grammars map underlying semantic roles, for example, agent, action, entity, attribute, etc., directly onto a linear position in a surface expression.⁶ These grammars do not make reference to the syntactic categories, relations, or rules which define the adult grammar. In short, on a semantically-based model, the early "grammar" is asyntactic. Although accounts vary as to the duration of the semantically-based system, it has been argued that the grammar is bereft of a syntax until age three or four (Maratsos, 1982) or five (Marantz, 1982).

In Chapter Five we will discuss several descriptive inadequacies of the semantically-based grammars. As we will see, these grammars provide no account of various acquisition data, including agreement phenomena in inflected languages, and the distribution of grammatical elements like pronominal clitics. For the present, we

limit our discussion to other empirical and conceptual problems which are engendered by this approach.

Proponents of semantically-based grammars, in particular Bowerman (1973), explicitly reject the approach to language acquisition outlined in the previous section. Bowerman argues that in order to describe children's language one must "examine the characteristics of their utterances closely without preconceptions" (p. 177), i.e., independent of any particular framework which is motivated by the facts of adult languages. With regard to the particular framework which we assume, transformational grammar, Bowerman writes:

. . . using a transformational framework for writing [child] grammars forces us to postulate deep structure constituents and grammatical relations which have not been justified [by child language] and which thus may not correspond to the characteristics of children's linguistic knowledge. We do not need such powerful and abstract concepts as "subject" and "predicate" to represent the facts of children's speech early in development, and to write grammars which give them formal representation is to rely too heavily upon concepts needed for an adequate explanation for adult speech without recognition that the phenomena which necessitate them may be absent from child speech. (p. 194)

Bowerman goes on to suggest that,

The grammatical knowledge which underlies the earliest two and three word constructions may be no more complex than simple rules to order words which are understood as performing semantic functions like "agent," "action," and "object" acted upon. Children may find certain semantic concepts easier to understand or more attractive than others for nonlinguistic, cognitive reasons. (p. 190)

There is much that warrants discussion here. Let us begin with certain methodological considerations. First, it is important to note that Bowerman is not claiming that the data are describable only in semantic terms. Rather the argument advanced is that a grammar which makes reference to semantic notions is somehow "simpler," "less abstract," or "less powerful" than a grammar stated in terms of syntactic categories and relations. Given that this is the only justification ever offered for the semantically-based systems, one would like to see the evidence supporting such an assertion. Apart from a vague reference to "non-linguistic, cognitive" factors, we are never provided with the precise metric which Bowerman uses to evaluate the relative simplicity or abstractness of semantic and syntactic primes. Thus, Bowerman first warns us against approaching the data with "preconceptions." She then goes on to argue, without any justification whatsoever, that a semantically-based system is a simpler and less abstract account of the data.

Let us assume for the sake of argument that semantic concepts, such as agent or action, are "simpler" in the sense that they are somehow grounded in the child's (or the adult's) conceptual system. This amounts to the claim that notions such as agent and action are needed to describe the child's early concepts. While this may well be true, it is an empirical question, and one which requires

independent (non-linguistic) justification. Let us suppose, however, that we find evidence that the child's conceptual system does represent knowledge in terms of agentivity, action, etc., it still does not follow from this that the child's grammatical system is based on these same categories. In short, the claim that a semantically-based grammar is "simpler" in some sense is a hypothesis concerning the nature of the child's linguistic capacity and not a self-evident truth, as is sometimes assumed.

It has never been denied that the grammatical system (of children and adults) interacts with other cognitive faculties, perhaps most prominently, the conceptual system. It may also be the case, as has been suggested by Slobin (1973) and others, that certain cognitive developments necessarily precede certain linguistic developments. It seems reasonable to assume, for example, that particular lexical items will not be acquired before the child is able to understand the meaning of the words. Finally, we expect that the child might use semantic/conceptual information in determining some aspects of linguistic structure, for example, he may assume that 'if x performs the semantic function of agent x is a noun.'⁷ As far as we can tell, these issues do not bear on the question of the form of early grammars. Empirical support for a semantically-based child grammar would be provided by child language if, for example, the early utterances exhibited certain regularities, or "mistakes " perhaps, which are most adequately

characterized by a semantically-based grammar. As we will see in Chapter Five, none of the empirical predictions which follow from a semantically-based grammar are borne out by the data.

As we noted earlier, the semantically-based theories imply that grammatical development is a "discontinuous" process, one which relies on different devices at different points in time. If child grammars are fundamentally different from adult grammars, the question arises as to how the transition to the adult system is effected. Unfortunately, theories which would explain this qualitative leap are notably absent from the acquisition literature. Maratsos (1982), for example, suggests that the child may "induce" syntactic categories from distributional and morphological regularities in the data. As Valian (1981) and Fodor (1980) note, an inductive system like that proposed by Maratsos presupposes the syntactic categories it is supposed to create. Valian correctly asserts "that any system utilizing distributional regularities requires a theoretical vocabulary in which to mark the regularities." (p. 49). Simply put, how can a child entertain the hypothesis that 'x is a verb if x bears tense marking,' for example, if the child's theoretical vocabulary does not include the category 'verb.' Abstracting away from the problem of "inducing" syntactic categories, Maratsos' proposal still suffers the same inadequacy as all other

inductive theories, namely, it does not explain why the child fails to make many perfectly plausible inductive generalizations. For example--keeping things simple--why does the child fail to make the generalization that verbs, adjectives, and nouns form a unified class in the face of data like the following.

- (3) a. Daddy is eating ice cream
- b. Mommy bought a dancing bear
- c. Dancing is fun

Note that the transition question is not only problematic for those who believe that the adult system is "syntactically-based." Schlesinger (1981) assumes that the adult grammar, like the child grammar, maps semantic roles directly onto surface expression. He claims, however, that in the child's system the mapping is one-to-one, for example, agent onto first position. (It is not at all clear that there is ever a stage in which children only use agent subjects, but let us assume that this is true).

Schlesinger notes that in the adult system the 'subject' (our term, not his) is not uniquely identified as agent; it may be experiencer (with a verb like see), or theme (as in the ball bounces), etc. Thus, for the child acquiring a Schlesinger-type grammar, the transition is from a grammar which defines a one-to-one mapping of

semantic roles onto surface expressions, to a grammar which defines a many-to-one mapping. To account for the transition, Schlesinger proposes the 'semantic assimilation hypothesis,' whereby the early semantic category agent expands and "assimilates" all the other semantic roles borne by 'subjects' (our term). We thus have a superordinate category, call it AGENT, which includes agents, experiencers, themes, etc. At this point, the child has arrived at the adult system. It seems clear that Schlesinger's description of the transition (and we should add, the adult grammatical system) simply robs the semantic notion agent of all content. Schlesinger's proposal is instructive, however, in two respects. First, that his analysis requires a device like 'semantic assimilation' makes it reasonably clear that his semantically-based grammar cannot provide an adequate description of child language. If it did, Schlesinger would not have to create a category AGENT (read 'subject'). Second, that his system allows a device like 'semantic assimilation' simply underscores the fact that the grammar he proposes (and semantically-based grammars, in general) is entirely unconstrained, and hence, devoid of any explanatory power. It seems to us that in the absence of (a) empirical support for semantically-based child grammars, and (b) a principled explanation of the transition to an adult grammar, the semantically-based models (and the "discontinuous" view of grammatical development they imply) must be rejected.

Before concluding this section, it is worth noting that theories of semantically-based child grammars give rise to a curious paradox. On the one hand, it is argued that these grammars are "simpler" than a grammar which makes reference to syntactic categories, relations, rules, etc. As we have seen, this has yet to be shown. However, even allowing for the sake of argument that this is true, whatever is gained in the way of simplicity at the level of particular child grammars is more than offset by the complexity of the system which would be needed to account for the transition to an adult grammatical system. As noted by Gleitman and Wanner (1982), "simple" grammars of the sort envisioned by Schlesinger, Bowerman and Braine simply make acquisition more difficult. This is immediately apparent as soon as attention is shifted from the problem of describing particular stages of child language, to that of explaining the process of grammatical development. If the goal is to describe a particular "stage" or "stages" of child language, then any number of descriptive devices will do the job. If, on the other hand, the goal is to provide a principled account of the process of grammatical development, then the descriptive devices must have independent theoretical justification.

In this study it is explicitly not our purpose to describe the corpus of a particular stage of child language, or of a particular child. We believe that such

general descriptions are possible only within the framework of a yet to be formulated comprehensive theory of language acquisition.⁸ Rather, we will argue that the continuous model of grammatical development, i.e., a successive series of grammars, each of which is of a form specified by principles of UG, provides an explanatory account of the rapidity and uniformity of grammatical development across children and languages, and a principled description of various aspects of the acquisition data, including an explanation for the absence of innumerable logically possible "mistakes" which children never make.

4. An Overview

In this study we are principally concerned with the developing grammars of two languages, English and Italian, though we briefly discuss the early grammar of German. The central claim of this thesis is that the early grammars are "possible" grammars in that they are determined by "fixing" each of the parameters of UG at one or another of a pre-determined set of values. Grammatical development is thus "continuous" in the manner suggested earlier.

As we noted in Section 2, a parameterized theory of grammar predicts that the early grammar of a language L may differ from the adult grammar of L with respect to the value specified for a particular parameter, provided that each of the values is within the permitted range. We will

show that this empirical possibility is realized in grammatical development with respect to a particular parameter of UG which we refer to as the AG/PRO parameter (a version of the Pro-drop Parameter--cf. Chomsky, 1981).

In Chapter Two we discuss the AG/PRO parameter in detail. We consider the two options made available by this parameter, and the manner in which choice of one or the other of these options gives rise to a different clustering of properties which distinguish pro-drop and non-pro-drop languages. We examine, in particular, English and Italian. In Chapter Two we limit our attention to adult grammars.

In Chapter Three we compare the early grammar of English to the adult grammar of English. We argue that these two grammars also differ with respect to the value specified for the AG/PRO parameter. This variation is responsible for many of the salient properties of early English, which distinguish it from the adult language.

The properties of early English which we examine appear very early in the acquisition process. The children whose language is considered are between the ages of two and three years (roughly). We therefore propose that the value specified in the early grammar of English is the "initial" value of the AG/PRO parameter, where "initial" value is defined as the value given (by UG) in advance of linguistic experience with a particular language. If this is the case we expect that the early grammar of other languages will have this same value for this parameter. Thus,

in Chapter Three, we briefly consider the early grammar of German, and in Chapter Four we compare the early grammars of Italian and English.

Another issue which we consider is the process of "restructuring" in the developing grammars. One form of restructuring is the resetting of a particular parameter. We assume, following Klein (1982), that where the early grammar of L differs from the adult grammar of L, the former must be "delearnable" on the basis of positive evidence available in the child's linguistic environment. Thus, in Chapter Three, we also discuss the data which could induce a resetting of the AG/PRO parameter in the developing grammar of English.

4.1 A Note on Methodology

In studying adult linguistic competence one most often uses grammaticality judgments as a data base. This is not because introspective evidence has some privileged status in the study of grammar, but rather because it has proved an effective method of tapping linguistic knowledge. First, in using grammaticality judgments, we eliminate from the data base many "deficient" data (see note 2), for example, data which are the result of limitations in memory or attention. Second, it provides access into otherwise inaccessible aspects of linguistic knowledge, such as knowledge of ambiguity, synonymy, and perfectly acceptable

sentences which, for one reason or another, simply do not occur, or occur only rarely in actual speech.

Unfortunately, in the study of early grammatical development, this form of introspective evidence is unavailable. Children under a certain age (roughly five years) appear not to have the (metalinguistic) abilities necessary to make such judgments (Gleitman, Gleitman & Shipley, 1972). Consider, for example, the case of word-order. Children acquiring a fixed word-order language like English use correct word-order in their spontaneous speech from the point at which they begin concatenating words (Brown, 1973). At this age, however, and for some time thereafter, they are unable to judge the relative acceptability of imperative sentences like 'eat the cake' and 'cake the eat' (de Villiers, 1972). Similarly, children under three years perform badly on experimental tasks designed to test their comprehension of word-order (Slobin, 1982). In the absence of an effective technique for eliciting grammaticality judgments from young children, we are forced to rely on spontaneous speech.

The data which we use in this study are from naturalistic longitudinal studies of English and Italian speaking children. The properties of early language which we consider have been consistently observed in the speech of young children, for example, 'subjectless' sentences, and the absence of modals and auxiliaries. It seems

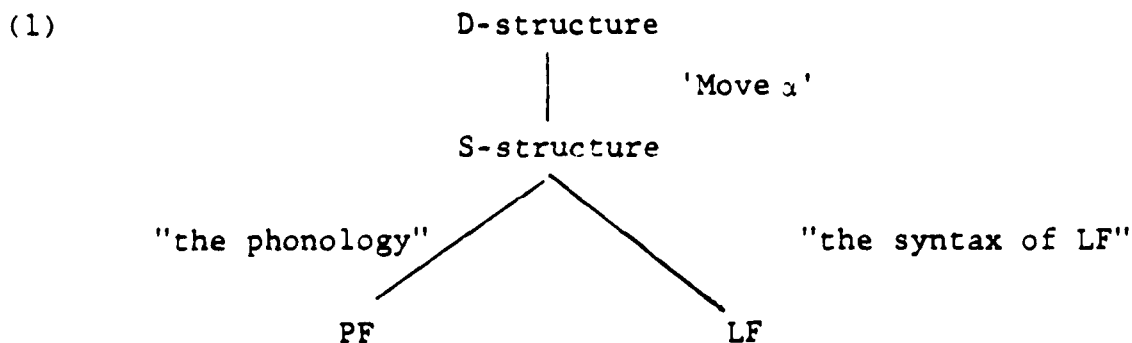
reasonable to assume that the consistent use of a particular construction (whether or not it is "correct" from the point of view of the adult language) is reflective of some general process, while performance errors will be random, both within the corpora of a particular child and across different children. In limiting our attention to certain regular and productive processes we hope to have circumvented some of the problems inherent in using production data as a basis for grammatical analysis.

In the Appendix which follows, we outline the theory of grammar which we assume (cf. Chomsky, 1981; 1982). This presentation is not meant to be comprehensive. We discuss only those aspects of the theory which are relevant to the analyses proposed in the following chapters.

Appendix: The Theory of Grammar

The basic insight of recent theories of grammar, and of Government-Binding Theory (GB) in particular, is that the grammar is "modular," i.e., it consists of several interacting subcomponents, each of which exhibits distinct properties. We may view the grammar as defining subsystems of rules which provide representations at several linguistic levels, and subsystems of principles which constrain representations at each of the various levels. The grammatical rules give rise to four levels of linguistic representation: D-structure (deep structure). S-structure,

Phonetic Form (PF) and Logical Form (LF). A sentence S is grammatical if and only if it has a well-formed representation at each linguistic level. The organization of the grammar is schematized in (1).



Let us first distinguish the various subsystems of rules. D-structures are generated by rewriting rules of the categorical component (alternatively referred to as the 'phrase structure component' or 'the base'). S-structures are derived by application of transformational rules which may be viewed as instantiations of the general schema 'Move α ,' where the value for α may vary from language to language, as noted in Section 2. The mapping from S-structure to PF is referred to as the "phonology" or the "phonological component," although it includes, apart from phonological rules, operations such as 'affix hopping,' 'cliticization,' 'deletion,' and various 'stylistic rules.' In short, it contains those rules which do not enter into the determination of Logical Form.

(We return to this shortly.) The LF component includes rules which characterize the scope of quantifiers (May, 1977) and rules which assign antecedents to anaphors. LF is a representation of those aspects of meaning which are determined by sentence grammar.

One of the essential claims of the grammatical model in (1) is that S-structure feeds into two separate components which do not interact with each other. LF rules do not "see" the operations of the phonological component. Similarly, the application of LF rules does not have any phonological representation. Thus, as we noted in Section 2, the language learner has no direct evidence of rules and representations of LF. We therefore proceed under the assumption that properties of this component are universal, i.e., given a priori. Note, however, that this is an empirical issue. Our assumption is wrong if it should turn out that there are language particular rules which must apply in the syntax of LF.

In this study we will have little to say about the rules which operate in the syntax of LF. Thus, for our purposes we may assume that representations at LF are isomorphic with S-structures. (For discussion of LF rules, see May (1977), Chomsky (1981) and references cited therein.)

Let us now turn to the subsystems of principles which determine the well-formedness of representations at the various levels. We begin with \bar{X} -theory, which

constrains the form of the categorial rules, i.e., representations at D-structure. Our discussion of \bar{X} -theory is adapted from Stowell (1981).

The categorial rules conform to the \bar{X} schema given in (2) (Chomsky, 1970).

$$(2) \quad X^n \rightarrow \dots X^{n-1} \dots$$

There are several principles implicit in the schema in (2), two of which are of concern here. First, \bar{X} theory requires that each phrasal expansion contain a 'head' term of the same feature specification, e.g., NP (\bar{N}) is headed by N. Following Stowell (1981) we refer to this as the 'endocentric requirement.' As Jackendoff (1977) and Koster (1978) have observed, this requirement rules out a number of otherwise possible phrase structure rules, for example, the rule in (3) which was frequently invoked (e.g., Rosenbaum, 1967) to account for the parallel distribution of S and NP.

$$(3) \quad NP \rightarrow S$$

A second principle implicit in the schema in (2) is that each head "projects" into a maximal expansion (X^{\max}). For example, N projects a category NP. As noted by Stowell, this principle has important implications for

language acquisition since it provides the mechanism by which the child may deduce hierarchical structure from a surface string. If the child "knows" that a lexical item x is a verb, then he also "knows" that x is contained within VP. The situation is analogous for nouns, prepositions, etc. We discuss this issue further in Chapter Three.

Outside the basic schema in (2) we expect to find language particular variation. Thus, as we noted earlier, languages may vary in the orientation of heads with respect to complements. In English, an object follows the verb in VP, while in German the object precedes the verb. Similarly, languages may vary as to the number of bars which constitute a maximal projection, and so on.

Included in the set of categorical rules are the expansions of S and \bar{S} , as follows. Following Chomsky (1981), we assume that (order aside) the expansion in (4b) is universal.

- (4) a. $\bar{S} \rightarrow \text{COMP } S$
 b. $S \rightarrow \text{NP INFL VP}$

Following ideas in Hale (1979), further developed in Chomsky (1980) and Stowell (1981), we take INFL to be the head of S (i.e., $S = \overline{\text{INFL}}$). We further assume that COMP is the head of \bar{S} (i.e., $\bar{S} = \overline{\text{COMP}}$). Our analysis of INFL departs slightly from other analyses in that we assume the expansion of INFL is as in (5).

(5) INFL → (AG) AUX

AG (=agreement) contains a set of features for person, number and gender associated with the subject. AG is present in tensed clauses, and generally absent in tenseless clauses, for example, infinitives and gerunds.⁹ The category AUX contains Tense features, and, depending on properties of particular languages, lexical elements such as modals or verbs. In Chapter Two we discuss the internal structure of INFL in greater detail. For the present we will assume that AG is the head of INFL, though this will be revised slightly in Chapter Two. Thus, each of the rules in (4) and (5) conforms to the schema in (2), i.e., all expansions are headed.

One question which arises in connection with the basic schema presented in (2) is how much additional information need be specified in the categorial rules. For example, do we need to specify the complements which are selected by particular heads, as suggested by the rules in (6) (Chomsky, 1965).

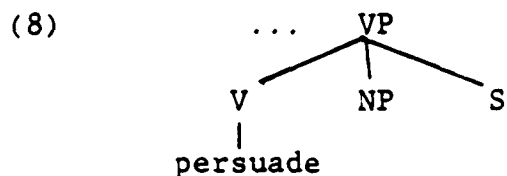
(6) a. VP → V NP
b. VP → V NP S
c. VP → V NP PP
. . .

Note that this information is entirely recapitulated in the lexical entries of particular items in the form of sub-categorization frames. The complement structure in (6a), for example, is contained in the entry for the verb hit; that in (6b) in the entry for the verb persuade, and that in (6c) in the entry for put, and so on. Within GB theory this redundancy in the system has been largely eliminated by the introduction of the Projection Principle.

(7) The Projection Principle

Representations at each syntactic level (i.e., D-structure, S-structure, and LF) are projected from the lexicon, in that they observe the sub-categorization and θ -marking properties of lexical items.¹⁰

Thus, a (partial) phrase structure tree like that given in (8) may be thought of as a "projection" of the subcategorization frames contained in the lexical entry of the verb, as opposed to being the output of a rule, such as those in (6).



Although a comprehensive discussion of this issue is beyond the scope of this study, it is clear that from the point of view of acquisition, the simplification (or

elimination)of the rules of the categorial component is welcome.¹¹ (For extensive discussion of this question, see Stowell, 1981.)

Our discussion of the Projection Principle leads us directly into the second "module" that contributes to D-structure representation, the lexicon. The lexicon is a specification of inherent idiosyncratic properties of lexical items, in particular, the subcategorization frames and Θ -marking (Θ = thematic) properties of lexical items which serve as heads of constituents. By Θ -marking properties, we mean a specification of the set of Θ -roles (e.g., agent, theme, goal) which the lexical items assign to particular structural positions.¹² For example, contained in the lexical entry of the verb hit is the information that it assigns an agent Θ -role to its subject, and a theme Θ -role to its object.

Subcategorization and Θ -marking are closely related notions in that a lexical head assigns a Θ -role to each of its subcategorized complements. Thus, the verb persuade in (8), for example, assigns a Θ -role to both its object and clausal complement. Θ -marking is, however, a broader notion than subcategorization since a Θ -role may also be assigned to a non-subcategorized position--the subject.¹³ Θ -marking to a subcategorized position is referred to as 'direct Θ -marking,' while Θ -marking to the subject position is 'indirect Θ -marking.' Following Safir (1982), we

assume that the subject receives its Θ -role via the following rule.

(9) Assign a Θ -role T to sister of VP

We further assume that the identity of T in (9) (i.e., whether agent, theme, experiencer, etc.) is determined compositionally by the elements in VP. Thus, the subject John in the examples in (10) bears a different Θ -role in (10a) and (10b) though the verb is the same in both sentences.

- (10) a. John broke a window
b. John broke his arm

(For further discussion, see Marantz, 1980.)

Henceforth, a position which is assigned a Θ -role is referred to as a Θ -position. Thus, the subject and object positions of the verb hit are Θ -positions.

The assignment of Θ -roles (whether direct or indirect) is governed by the Θ -Criterion, a biuniqueness condition which imposes a one-to-one mapping of Θ -roles onto arguments. (The set of arguments includes names, definite descriptions, pronouns, anaphors, and variables.)

(11) The Θ -Criterion

Each argument bears one and only one Θ -role and each Θ -role is assigned to one and only one argument.

The Θ -Criterion is closely related to the Projection Principle presented in (7). In particular, from the interaction of these two principles we derive the basic effects of the 'trace theory of movement,' i.e., that a moved NP leaves behind a coindexed trace (Fiengo, 1974; Chomsky, 1977). Let us see why this is so. As noted previously, the verb hit subcategorizes (and hence Θ -marks) the direct object position. By the Projection Principle this position must be present at all syntactic levels, D-structure, S-structure and LF. Consider the following representations.

- (12) a. [e] was hit John by Mary
b. John_i was hit [e_i] by Mary
c. * John_i was hit by Mary
d. * John_i was hit [e_j] by Mary¹⁴

We may assume that (12a) is a D-structure, and (12b, c, d) are S-structures (and LF representations). At D-structure the lexical requirement of the verb hit is satisfied; the direct object position (containing John) is present. D-structure maps onto S-structure by the operation of 'Move α .' Thus, in (12b) the NP John has been moved

into subject position. At S-structure (and LF) the lexical requirement of hit is satisfied if and only if the moved element leaves behind a trace in direct object position, as in (12b). That is to say, the direct object position must also be present at S-structure (and LF) if the Projection Principle is to be satisfied. The structure in (12c) violates this requirement.

Now let us consider the status of these representations vis-a-vis the Θ -Criterion. In (12a) the argument John receives its Θ -role by virtue of the fact that it occupies a Θ -position. The subject position of a passive predicate, however, is a non- Θ -position. Thus, the argument John in (12b) must "inherit" its Θ -role from its coindexed trace (which does occupy a Θ -position). (Note that the "inheritance" of a Θ -role expresses the fact that the Θ -role assigned to John is the same in (12a) and (12b), i.e., the subject of a passive construction is the 'logical object.')

Thus, if movement does not leave a trace (as in (12c)), or if the trace is not coindexed with the moved NP (as in (12d)), the argument John does not receive a Θ -role, in violation of the Θ -Criterion.

To sum up, the Projection Principle requires that subcategorized positions and Θ -positions be present at all syntactic levels, and the Θ -Criterion requires that each Θ -position be assigned an argument. At D-structure, these conditions are satisfied if and only if each of the

arguments of an expression appears in a Θ -position. At S-structure, the requirements may also be met if each argument in a non- Θ -position (e.g., the subject of a passive sentence) is "linked" to a Θ -position via a coindexed trace.

Let us diverge briefly at this point to consider the implications of the Θ -Criterion and the Projection Principle for theories of grammatical development. On any account of language acquisition, it is assumed that the child must learn the meaning (and hence, the Θ -marking properties) of the particular lexical items in his language. The Projection Principle embodies the claim that the learning of a particular lexical item brings with it the "knowledge" of the syntactic structures in which this item appears. The child who "knows" the meaning of the verb hit, for example, "knows" that an agent acts upon a patient (or theme) in a particular manner. Moreover he "knows" that these Θ -roles are assigned to arguments which must appear in particular structural positions, i.e., subject and object position. To the extent that syntactic properties are derivable from lexical properties, the burden on the language learner is greatly reduced. In the Appendix to Chapter Three, we discuss some further consequences of the assumption that the early grammars are constrained by the Θ -Criterion and the Projection Principle.

Returning to our main line of discussion, it is important to note that the requirement that each Θ -position be assigned an argument does not entail that this argument

must be a lexical item, as in (12a,b). Within GB theory there are two null pronominals which act as arguments, PRO (read big PRO), and pro (read little pro). Unlike trace, which is introduced at S-structure by the application of 'Move α ,' PRO and pro appear in θ -positions at D-structure. We discuss each of these elements in turn.

PRO is the element typically found in subject position of infinitivals, as in (13).

- (13 a. Bill_i promised [PRO_i to go]
b. Bill persuaded Mary_i [PRO_i to go]
c. It is unclear what [PRO to do]

In (13a,b) PRO is "controlled"; that is to say, its reference is determined by the matrix NP whose index it bears. Thus, in (13a), PRO is controlled by the NP Bill, while in (13b), it is controlled by the NP Mary. The choice of "controller" is determined by lexical properties of the matrix verb. Thus, promise is lexically specified as assigning control to its subject, while persuade is specified as an object control verb. Where PRO is not controlled, as in (13c), it is arbitrary in reference (ARB). Thus, the sentence in (13c) means roughly 'It is unclear what one is to do.' In Chapter Two we discuss these properties of PRO in more detail. For our present purposes it is sufficient to note that PRO is necessary

to satisfy the Θ -marking properties of the embedded verb.

The second null argument, pro, is the element found in subject position of tensed clauses in languages like Italian and Spanish, the so-called 'pro-drop' languages. Some examples follow.

- (14) a. pro vado al cinema
 'pro go to the movies'
 ('I go to the movies')
- b. pro è molto contenta
 'pro is very happy'
 (She is very happy)

As indicated by the glosses (in parentheses), pro has a definite pronominal reference (which may be inferred from the inflection on the verb). The reference of pro is "inherent," that is to say, that unlike PRO it does not receive its reference from another NP. The element pro, is, in effect, a 'pure pronominal' minus a phonological matrix. The two elements pro and PRO also differ with respect to the environments in which they may appear. PRO occurs in a subject position of infinitivals, while pro appears as the subject of tensed clauses in certain languages. We will have more to say about the distribution of these two elements shortly.

We thus have four realizations of the category NP, lexical NPs, PRO, pro, and NP trace [e]. The class of lexical NPs may be further divided into pronouns, anaphors and names (i.e., R-expressions). A central concern of GB theory is to characterize the positions in which these different elements may appear. Note that a partial characterization is provided by the Θ -Criterion, which requires that arguments appear in Θ -positions at D-structure, and that a moved NP be linked to a Θ -position at S-structure (and LF). There are two other principles which determine the distribution of NPs at S-structure, the Case Filter, and the Binding Conditions. Both of these principles rely crucially on the notion of Government. Thus, we turn to this first.

Government is the central configurational notion of GB theory. In essence, it is the relationship which exists between a head and the elements which appear within the maximal projection of that head. The formal definition of government which we assume (from Aoun & Sportiche, 1980) is given in (15).

(15) α governs γ in the structure [... γ ... α ... γ ...]
₃

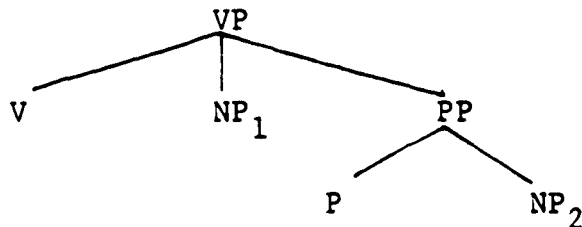
where,

(i) $\alpha = X^0$

(ii) where ϕ is a maximal projection, ϕ dominates γ if and only if ϕ dominates α .

The basic idea behind this definition is that a head (V,N,P,A,AG) governs all of the elements within its maximal projection, but it does not govern those elements within another maximal projection. For example, in the structure that follows, V governs NP₁; it does not govern NP₂ which is "protected" by the maximal projection PP. NP₂, however, is governed by P.

(16)



Note that given the notion of 'government', we can now reformulate our characterization of 'direct θ -marking.' Recall the 'direct θ -marking' is the assignment of a θ -role by a head to its subcategorized complements. This is precisely the domain of government. Thus, let us henceforth consider 'direct θ -marking' as ' θ -marking under government.'

Let us now return to the two principles noted earlier, Case theory and the Binding Condition. Case Theory is a specification of the syntactic positions in which lexical NPs may appear. The theory requires that all lexical NPs bear (abstract) Case. This principle is formulated as a filter--the Case Filter (Chomsky, 1980), given in (17).

(17) The Case Filter

*NP if NP has phonetic content and no Case

An NP receives Case just in case it is governed by a Case assigning category. The Case assigning categories (a subset of the "governors") are V, P, and the head of INFL (AG). An NP which is governed by AG receives 'nominative Case'; an NP governed by V receives 'accusative Case,' and an NP governed by P receives 'oblique' Case. Thus, in the structure in (16), both NP₁ and NP₂ are "Case-marked." NP₁ is Case-marked under government by V, and NP₂ is Case-marked under government by P. The subject position of a tensed clause (i.e., a clause containing AG) is Case-marked, as in (18). Crucially, however, the subject position of an infinitive (a clause which lacks AG) is not a Case-Marked position, hence the ungrammaticality of (18b).

- (18) a. John seems to love Mary
b. *It seems John to love Mary
[-case]

As a well-formedness condition on S-structure, the Case Filter interacts with the Θ -Criterion to constrain the operation of 'Move α .' The subject position of the verb seem is not a Θ -position. This is evidenced by the fact

that this position may contain expletive (i.e., non-argument) NPs such as it and there, as in (19).

- (19) a. It seems that John loves Mary
b. There seems to have been a riot in the park

At D-structure all arguments must appear in Θ -positions. Hence the D-structure representation of (18a) is as in (20).

- (20) [[e] seems [John to love Mary]]

The NP argument John receives its Θ -role from the VP love Mary. Note, however, that in (20) John appears in a Caseless position. In order to satisfy the Case Filter, this NP must 'raise' into the matrix subject position, which is Case-marked, as in (21).

- (21) John_i seems [e_i] to love Mary

Thus, the Case Filter requires that an NP be moved into a Case-marked position. Similarly, the Θ -Criterion entails that NP movement may only be from a Θ -position to a non- Θ -position, as in (21), and the passive example given in (12). If an NP moves from a Θ -position to another Θ -position, it violates the biuniqueness of the

θ-Criterion, i.e., it is "associated with" two θ-positions. If, on the other hand, an NP argument is base generated in a non-θ-position, it violates the θ-Criterion at D-structure. Thus, 'Move α' applies freely, subject to the requirements of independent principles of grammar.

Let us now consider the other principle which regulates the distribution of NPs at S-structure, the Binding Conditions. Unlike the Case Filter, the Binding Conditions do not distinguish between lexical vs. non-lexical NPs. In fact, one of the most significant discoveries of recent theories of grammar (Chomsky, 1977, 1980, 1981) is that the "empty categories" and the lexical NPs pattern alike with respect to these conditions. The Binding Conditions distinguish three classes of elements, anaphors, pronouns, and referring expressions (names and variables).¹⁶ The set of anaphors include reflexive and reciprocal pronouns (e.g., himself, each other) NP trace, and PRO. The set of pronouns include lexical (non-anaphoric) pronouns (e.g., he, him, etc.) and the empty categories pro and PRO. Finally, the referring expressions (R-expressions) include names, and definite and indefinite descriptions (e.g., John, the boy). The Binding Conditions are given in (22).

(22) The Binding Conditions

- A) An anaphor must be found in its governing category
- B) A pronoun must be free in its governing category
- C) An R-expression must be free

The definition of the notion 'bound' is given in (23).

- (23) α is bound by β if and only if α and β are coindexed, β c-commands α , and β is in an argument position (A-position).

An A-position is a position in which an argument may appear at D-structure, e.g., subject, object, indirect object positions.¹⁷ The definition of c-command we adopt (following Safir, 1982) is given in (24).

- (24) α c-commands β if the first maximal projection dominating α also dominates β , and α does not contain β .

We take the governing categories to be 'the NP or S in which an element is governed.'

Principle (A) of the Binding Conditions is illustrated in (25).

- (25) a. *The boy_i expects $\left[\begin{array}{c} \text{Mary to love himself} \\ \text{S} \end{array} \right]$
b. *John_i seems that $\left[\begin{array}{c} \text{Mary loves } e_i \\ \text{S} \end{array} \right]$

In both of the sentences in (25) an anaphor is unbound in the S which contains its governor (the verb love).

Principle (B) is illustrated in (26).

- (26) a. *John_i loves him_i
b. *John_i expects $\left[\begin{array}{c} \text{Mary to love him}_i \\ \text{S} \end{array} \right]$

In (26) the pronoun him is bound in its governing category by John. In (26b), in contrast, the pronoun is free in its governing category, though it is bound to an element outside the S. Principle (C) accounts for the examples below.

- (27) a. *He_i saw John_i
b. *He_i said that Mary saw John_i
c. *He_i said the boy_i is a liar

In (27) the R-expressions John and the boy are bound by a c-commanding NP. In the grammatical sentence in (28), in contrast, the NP John is not c-commanded by the coindexed element, and hence "free," as required.

- (28) That he_i won the prize amazed even John_i.

The Binding Conditions in (22) make an interesting prediction with respect to the null element PRO. PRO is defined as a 'pronominal-anaphor,' and hence falls under both conditions (A) and (B). Thus, if PRO has a governing category, it must be both free (by Condition B) and bound (by Condition A) in this governing category. It follows as a theorem of the Binding Conditions that PRO has no governing category, or in other words, PRO is ungoverned. Recall that the set of governors is N, P, A, V and AG, i.e., those elements which act as 'heads.' Thus, the only A-position in which PRO may appear is the subject position of an infinitive, as in the examples in (13).

We thus have three empty elements, trace, PRO and pro. These elements behave differently with respect to some of the principles of grammar we have discussed.

Trace enters into the Binding Conditions as an anaphor, pro as a pronoun, and PRO as a pronominal-anaphor. The two pronominal elements are arguments which can satisfy the Θ -Criterion, while trace is not; it must be 'linked' to an argument. The presence of these empty categories follows from the Projection Principle. Where a subcategorized or Θ -marked position is not specified, it contains one of the empty elements. If the position is lexically specified, it must be Case-marked.

We may think of the empty categories as containing a set of features for person, number, gender (and perhaps others). Following Chomsky (1982) we refer to this set of features as ϕ features. These features are reflected in agreement phenomena, for example, in predicate nominatives, and adjectival constructions.

- (29) a. The men_i seem [[e_i] to be linguists]
 (cf. *The men seem to be a linguist)
- b. The men_i want [PRO to be linguists]
 (cf. *The men want to be a linguist)
- c. pro sono felici_i
 [+mas. +plu.]
 '(they) are happy'

Note that in terms of intrinsic features, the empty categories are identical to AG, which, as we noted

earlier, is the collection of ϕ features contained in INFL. We discuss this further in Chapter Two.

This essentially concludes our discussion of GB theory. Various aspects of the theory will be discussed in more detail in later chapters where they are relevant to the particular analyses proposed.

Notes to Chapter One

¹We idealize to a 'homogeneous speech community' (Chomsky, 1965) which "shares" a particular grammar. It is possible, however, even given this idealization, that the child never arrives at the precise adult grammar. This variation in the grammars of successive generations may ultimately result in a "language change." (See Lightfoot, 1979 for discussion.)

²The data base to which the child is exposed is impoverished in two respects. First, the data are "degenerate"; second, they are "deficient." They are degenerate in that they contain performance errors, for example, false starts, slips of the tongue, etc. The deficiency of data is a much more serious problem. That is to say, that the child receives no direct evidence of ambiguity, synonymy, ungrammatical sentences, etc. Alternatively, there may be many perfectly acceptable sentence-types which never occur in his environment. Nevertheless, he develops knowledge of these aspects of his language.

It is sometimes claimed that 'poverty of the stimulus' arguments are invalid because the language to which the child is exposed is somehow tailored to his needs, and largely absent of performance errors. (This language is referred to as 'Motherese' (Snow & Ferguson, 1977)). But see Newport, Gleitman and Gleitman, 1977 for discussion of the Motherese Hypothesis. Even if this were true, the data remain 'deficient' in the sense just noted. (See Hornstein & Lightfoot, 1982 for discussion.)

³A grammar which is determined by fixing the parameters of UG in one of the specified ways is referred to as a "core" grammar (Chomsky, 1981). We may think of the grammar of a particular language as being a core grammar with a periphery of marked elements and constructions.

⁴An outline of the theory of grammar which we assume is given in the Appendix to this chapter.

⁵More precisely, the child fixes the parameters in a manner consistent with the data that he considers "relevant." White (1981) suggests that we should distinguish between "input" data, which may be similar at different stages of development, and the child's "intake,"

which may vary due to maturational factors, increasing memory, etc. We discuss this issue further in Chapter Three.

⁶Many of the proposals for semantically-based child grammars (e.g., Schlesinger, 1971; Bowerman, 1973) are inspired by Fillmore's (1968) Case Grammar. Within Fillmore's theory the underlying "case" relations of the sentence are semantic. A system of transformational-like rules maps the semantic representation onto a surface structure. There have been many questions raised about the adequacy of a Case grammar as a representation of adult competence (Chomsky, 1972).

⁷In the section that follows, we discuss a particular principle of grammar, the Projection Principle, which provides what we believe to be a principled description of the manner in which semantic properties (i.e., θ -role assignment), can affect syntactic structure.

⁸The obvious problem is that in the absence of sub-theories of language acquisition which explain each of the different developing systems we do not know which data bear on which system. The difficulty is compounded by the fact that in considering properties of very early language, we are in general dealing with production data in which we expect to find performance errors. As Chomsky (1975) has observed "data do not come with their explanation on their sleeve." Acquisition data are hardly an exception.

⁹Picallo (1983) proposes that subjunctive clauses are specified for AG, though they lack tense. We discuss this further in the Appendix to Chapter Two.

¹⁰ θ -marking refers to thematic (or semantic) role assignment. We return to this shortly.

¹¹Stowell (1981) proposes a theory of phrase structure in which the rules of the categorial component are entirely eliminated. Phrase structure representations are derived from the interaction of several principles of grammar, including the Projection Principle.

¹²For discussion of the properties of particular θ -roles, see Jackendoff (1972).

¹³See Chomsky (1965) for detailed discussion of sub-categorization.

¹⁴Following Chomsky (1977), we assume that indices are assigned at D-structure. A moved element carries its index with it (and leaves behind a co-indexed trace), canceling out any index which may have been generated on the empty position that it is substituted for. In the example sentences, we indicate only indices which are relevant to the discussion.

¹⁵There is another realization of NP, namely, the trace left by wh-movement, which is distinct in its behavior from the other empty elements. We will not discuss wh-movement or the properties of wh-traces in this presentation. The reader is referred to Chomsky (1981) and references cited therein.

¹⁶The trace of wh-movement is a variable.

¹⁷A-positions are not to be confused with Θ -positions. An Θ -position is a position to which a Θ -role is assigned, for example, the subject of the sentence in (i).

(i) John hit Mary

The matrix subject position in (ii) is not a Θ -position, though it is an A-position.

(ii) It seems that John is crazy.

CHAPTER TWO

THE NULL SUBJECT PHENOMENON

1. Introduction

One of the most noticeable characteristics of early language is the frequent absence of lexical subjects. Sentences like those in (1) have been attested in every study of the early periods in the acquisition of English (McNeil, 1966; Gruber, 1967; Menyuk, 1969; Bloom, 1970; Braine, 1976, among others). The following (non-imperative) sentences, taken from Bloom (1970), are representative of the general phenomenon.

- (1) Play it
Eating cereal
Shake hands
See window
Want more apple
No go in

We will argue that the above sentences, though ungrammatical in adult English, are the well-formed output of an early grammar, which we refer to as G_1 . We will further argue that G_1 is a "possible" grammar, though it

differs from the adult grammar of English. In particular, it differs with respect to the value specified along a specific parameter of UG, the AG/PRO parameter.

The AG/PRO parameter, otherwise referred to as the 'Pro-drop Parameter' (Chomsky, 1981), or the 'Null Subject Parameter' (Rizzi, 1982) accounts for the possibility of phonologically null subjects in languages like Italian and Spanish, a phenomenon which we noted in the Appendix to Chapter One. The formulation of the parameter which we propose differs from previous analyses in certain details of execution. More significantly, it differs with regard to the range of data it explains. In particular, we argue that certain differences in the auxiliary systems of pro-drop and non-pro-drop languages (Italian and English, respectively) is closely connected to the null subject phenomenon.

Thus in this chapter we limit our attention to the adult grammars of Italian and English, which represent the two possible grammar "types" defined by this parameter. The theory proposed in this chapter provides a framework within which to examine various acquisition data, including the sentences in (1), to which we return in Chapter Three.

Chapter Two is organized as follows. In the next section, we discuss aspects of the grammar which were not considered in detail in our general outline of the theory of grammar, including the internal structure of INFL, and

Rule R ("affix hopping"). In Sections 3 and 4 we discuss the AG/PRO parameter. Finally, in the Appendix to this chapter, we present a particular morphological parameter which describes the language particular variation in the set of features which are morphologically realized on the verb. The languages we consider are English, Italian and two northern dialects of Italian, Trentino and Fiorentino. Our discussion of the morphological variation exhibited by these languages is again intended to provide a theoretical framework within which to understand the development of particular morphological processes in young children. This aspect of grammatical development is discussed in Chapter Four.

2. The Structure of INFL

In Chapter One we noted that the categorial component includes the rules in (2).

- (2) a. S → NP INFL VP
b. INFL → (AG) AUX

Following Chomsky (1981), we assume that (order aside) the base rule in (2a) is universal; that is, all sentences contain a subject position, an INFL (=inflection) node, and a predicate position.¹ Similarly, we assume that the

expansion in (2b) is invariant across languages, though, as we will see, there is language particular variation with respect to whether the features in INFL are morphologically realized on the verb, and also with respect to the class of elements which may appear under AUX.

As noted earlier, AG contains a set of features for person, number, and gender associated with the subject. We henceforth refer to these features as ϕ features (Chomsky, 1982). AUX contains (minimally) Tense features [+/- tense], where [+tense] stands for finite and [-tense] for infinitival (and gerunds). We assume that the featural composition of INFL is invariant across languages, though we find variation with respect to the choice of features (if any) that are morphologically realized on the verb. In some languages, for example, Italian and German, the ϕ features in AG are realized on the verb in the form of overt inflection, while in other languages, notably English, they are not. We may think of the former languages as containing a particular morphological process of "spelling out" the features of AG.³ A similar process is available for Tense features. From an acquisition point of view, it is the language particular "spell out" rules (and their various idiosyncratic properties, for example, defective paradigms) which must be learned. In the Appendix to this chapter we discuss these morphological processes in greater detail. The acquisition problem is addressed in Chapter Four.

Another form of language particular variation associated with INFL concerns the class of elements which may appear under AUX. As we noted previously, we assume that the Tense features are generated in AUX (roughly following the Standard Theory analysis). As we will observe, however, languages vary with respect to whether lexical elements, for example, modals and verbs, may also appear in that position. We assume (again within the spirit of the Standard Theory) that in English AUX dominates the modals (e.g., can, may, etc.). We further assume, following Emonds (1976), that have and be (main verb and aspectual) may raise into AUX from VP. On our analysis, the 'verb raising' is optional. Where a modal, auxiliary, or the 'dummy' verb do appears under AUX, it absorbs the Tense feature which occupies that position. In fact, we may think of do as a pure representation of Tense, and otherwise void of intrinsic semantic content.

As noted in Chapter One, we assume, following Stowell (1981) and others, that INFL is the head of S. Thus far, we have also assumed that AG is the head of INFL. At this point, however, we revise the latter assumption as follows.

(3) Head Assignment Principle

Where AUX contains lexical material, AUX heads INFL;
otherwise AG heads.

Henceforth, we assume that the head of INFL is variable in the manner specified in (3), and that the head of INFL is a governor. Recall that within the framework we are assuming (abstract) Case is assigned under government. For ease of exposition we repeat below the definition of government which we adopt.

(4) (From Aoun & Sportiche, 1981)

α governs β in the structure (... β ... α ... β ...)
 γ

where

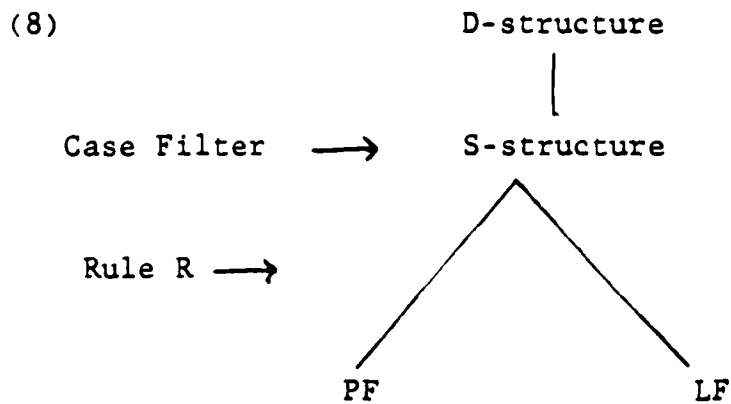
(i) $\alpha = x^0$

(ii) where ϕ is a maximal projection, ϕ dominates β if and only if ϕ dominates α

As noted previously, the basic idea behind this definition is that a head governs within its maximal projection. We may therefore assume that where AUX heads INFL (i.e., where it is lexical) nominative Case is assigned to the element in [NP,S] by the [+tense] feature contained in the modal, auxiliary, or 'dummy' verb do. Where AG heads INFL, nominative Case is assigned to the subject by AG. We further assume that nominative Case assignment by AG is subject to an agreement requirement; that is, AG must agree in ϕ features with the element to which it assigns nominative Case.

Once the AG and Tense features are attached to the verb as in (7b), they may be morphologically realized as verbal inflection. We reserve discussion of the "spell out" process until the Appendix to this chapter.

To sum up then, at S-structure AG (or a lexical AUX) governs and assigns nominative Case to the element in subject position. Thus the structures in (6a) and (7a) meet the requirements of the Case Filter, which applies at S-structure and which specifies that all lexical NPs must have Case. Post-S-structure (on the mapping from S-structure to PF) Rule R hops the contents of INFL onto a verbal stem. The structures given in (6b) and (7b) therefore meet the requirement that affixes be bound at PF, as specified by the filter in (5). For ease of exposition we repeat below the model of grammar given in Chapter One.



2.1 Rule R

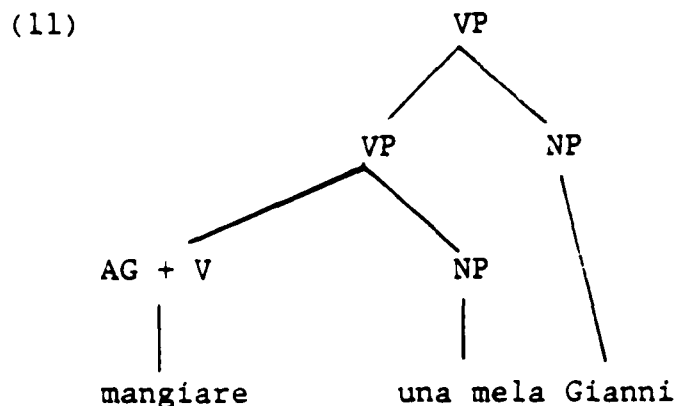
It is well-known that certain languages (notably Spanish and Italian) allow the subject of a sentence to be expressed either preverbally, as in (9a), or postverbally, as in (9b).

- (9) a. Gianni mangia una mela
b. Mangia una mela Gianni
'Gianni eats an apple'

Following Chomsky (1981), we assume that in Italian (and Spanish) Rule R has the option of applying either in the phonology (i.e., on the mapping from S-structure to PF) as in English, or in the syntax (i.e., on the mapping from D-structure to S-structure). Where Rule R applies in the phonology, AG governs (and assigns Case) to the element in [NP,S] and thus the subject appears in preverbal position, as in (9a). The S-structure and PF representations of (9a) are analogous to those of the English sentence in (7). Where Rule R applies in the syntax, the features of AG are located on V at S-structure and thereby govern and assign nominative Case to the subject contained in VP,⁴ as in (9b). Thus the S-structure (and PF) representation of the sentence in (9b) is as follows.

(10) [[e] [] [AG + mangiare una mela Gianni]]
 S NP; INFL VP

The internal structure of the VP in (10) is as in (11)



Recall that the assignment of the subject θ -role is effected by the following rule.

(12) (From Safir, 1982)

Assign θ -role T to sister of VP

The rule in (12) assigns a θ -role to either a preverbal subject (English or Italian), or a postverbal subject (Italian). Where the θ -role is assigned postverbally, the [NP,S] position is a non-thematic position which may only contain an expletive. We will thus assume that the element in [NP,S] in the sentence in (9b) is a phonologically null expletive, which we henceforth refer to as ex.⁶

Thus the position of a lexical subject is determined by the parametric variation associated with Rule R, that is, whether the grammar allows Rule R to apply in the syntax as well as the phonology.

3. Null Subjects and the Identity of AG

Returning now to the expansion of S in (2a), we note that the obligatory presence of the subject position does not entail that the subject must be lexically realized in all languages. In the Italian examples noted in the previous section, the lexical subject is realized in either preverbal or postverbal position. There is, however, a third situation which arises in Italian (and Spanish), for example (discussed briefly in Chapter One), in which the subject is not lexically specified as in (13).

(13) Mangia una mela
'Eats an apple'

Although the subject in (13) is not phonologically realized, the sentence is interpreted as having a definite pronominal subject, and is thus equivalent to the sentence in (14).

(14) Lui (lei) mangia una mela
'He (she) eats an apple'

The English analogue to (13) is, of course, ungrammatical.

This variation with respect to whether the subject need be phonologically realized or not, typically referred to as the 'pro-drop' or 'null-subject' parameter (Rizzi, 1982), has been the focus of much attention in the generative literature (Chomsky, 1979; 1980; 1981; 1982; Taraldsen, 1978; Jaeggli, 1980; Borer, 1981; Rizzi, 1982; Safir, 1982, among others). Although the above accounts differ from each other in various respects, there is a wide consensus that the pro-drop phenomenon is related to properties of the INFL node. Of particular interest is the proposal in Rizzi (1982) where it is argued that INFL in pro-drop languages is 'pronominal.'

Rizzi argues that INFL is optionally specified with the features [+pronominal]. Where INFL is so specified it assumes clitic-like properties. First, it takes over the syntactic "duties" of the subject by absorbing the Case and θ -role which would otherwise be assigned to the element in [NP,S] position. Second, as a clitic, INFL acts as a 'proper governor' which licenses an [e] in _{NP} subject position. (For discussion of the notion 'proper government,' see Rizzi, 1982; Chomsky, 1981.)⁷ In this chapter we will propose an analysis of the pro-drop phenomenon which follows in the spirit (if not detail) of Rizzi's proposal. In particular, we pursue his idea that AG in pro-drop languages is 'pronominal.'

Recall from our discussion in Chapter One (Appendix) that AG is identical to an empty category in terms of its intrinsic \downarrow features (the features for person, number, and gender). It is thus reasonable to inquire whether AG exhibits any of the other properties associated with one or another of the empty categories. In this chapter we will show that AG, in pro-drop languages, exhibits all of the crucial properties of PRO, the element typically found in subject position of infinitivals, and is thus to be identified with PRO in those languages. It is in this sense that AG is 'pronominal.' Thus on our analysis, grammars may vary as to whether AG is or is not PRO. Where AG = PRO it licenses a null element in subject position. Henceforth, we refer to this 'pronominal' AG as AG/PRO.⁸

As we noted in Chapter One, we assume, following Chomsky (1982), that the empty category which appears in subject position of tensed clauses in pro-drop languages is pro--a pure pronominal minus a phonetic matrix. Let us assume then that a necessary condition on pro is that it be governed by AG/PRO. Thus, in a language in which AG \neq PRO, English for example, pro is impossible. We may further assume that pro receives nominative Case and a Θ -role in the manner of a lexical pronoun, and is thus syntactically indistinguishable from the latter. It is for this reason that null subject sentences, for example,

the sentence in (13), are interpreted as having a definite pronominal subject.

As we will see, the AG/PRO analysis ties together several seemingly unrelated phenomena in at least two pro-drop languages, Italian and Spanish, including instances of control into embedded tensed clauses, the arbitrary reference associated with the subject of a tensed clause and the subject of the 'impersonal si' construction, and the impossibility of auxiliary elements in INFL in tensed clauses. This last property was alluded to in our discussion of AUX (Section 2), where we suggested that languages vary with respect to the type of elements which may appear under AUX. We will argue that the clustering of properties listed above are effects of the AG/PRO parameter.

In the sections that follow we discuss the PRO-like properties of AG in pro-drop languages. Our example sentences are (for the most part) in Italian, though the arguments hold for Spanish as well. We begin by reviewing the relevant properties of PRO.

3.1 The Properties of PRO

Recall from the discussion in Chapter One that PRO is the empty category which typically appears in subject position of embedded infinitivals. PRO may be controlled by a subject or object NP in the matrix clause, as in (15).

- (15) a. Marie_i wants [PRO_i to go]
b. Marie persuaded Bill_i [PRO_i to go]

Whether PRO is controlled by the subject or object is determined by lexical properties of the matrix verb. Thus want is specified as a subject control verb, while persuade assigns object control. The controller of PRO determines its reference. Where there is no controller, PRO is arbitrary in reference (=ARB), as in (16).

- (16) It is unclear [who_i[PRO to visit e_i]]

The set of grammatical features associated with arbitrary PRO may vary from language to language. In Italian, for example, arbitrary PRO is specified as masculine, plural (as evidenced by agreement phenomena), while in Spanish it is masculine, singular. (See Belletti, 1982; Chomsky, 1981, for discussion.)

As noted previously, PRO is a pronominal anaphor. Given the Binding Conditions, which require that pronominals be free, and anaphors be bound, in their governing category, it follows that PRO may have no governing category and must therefore be ungoverned. The governors, recall, are the lexical categories [+N, +V], and the head of INFL, i.e., AG or lexical AUX. Thus PRO may appear in subject

position of infinitivals which is an ungoverned, or "transparent," position.⁹

PRO may also appear in a second transparent position--COMP. Jaeggli (1980) has proposed a rule of PRO-movement for Topics. On his analysis the underlying structure of (17a) is as in (17b).

- (17) a. Mary, I believe left yesterday
b. Mary [PRO_i [I believe [e_i left yesterday]]]
 COMP S

The PRO movement analysis eliminates the need for an obligatory deletion of a Wh-element in COMP, necessary if one assumes a Wh-movement analysis of Topics as proposed in Chomsky (1976).

Similarly, Chomsky (1981) proposes that purposive infinitivals involve PRO-movement to COMP. Thus the sentence in (18a) has the underlying structure in (18b).

- (18) a. I bought a dog to play with
b. I_j bought a dog_i [PRO_i [PRO_j to play with [e_i]]]
 COMP S

The Binding Conditions are satisfied (vacuously) only if PRO is ungoverned. This then is its essential property--distinguishing PRO from all other empty categories. PRO may thus appear in the subject position of infinitivals, and in COMP. On our analysis PRO appears

in yet a third ungoverned position--as AG in INFL. We list below the three properties of PRO that will concern us.

- (19) a. PRO may be controlled
- b. PRO may be arbitrary in reference
- c. PRO is ungoverned

In the sections that follow we will show that AG in pro-drop languages behaves like PRO with respect to each of the properties listed in (19). The fact that AG, like PRO, must be ungoverned will account for a range of differences in the auxiliary system of pro-drop and non-pro-drop languages, Italian and English respectively.

3.1.1 Control of AG/PRO

Westphal (n.d.), Suñer (1982), and others have noted that there exists in Spanish a class of verbs which take inflected sentential complements with obligatorily null subjects. This same phenomenon exists in Italian. The class of verbs includes perception verbs, for example, vedere (see), sentire (hear), notare (notice), etc., and other, non-perception verbs, for example, conoscere (know), scoprire (uncover), incontrare (meet), lasciare (leave). Several examples follow.

- (20) a. Ho visto Luisella che ballava come una matta
 'I saw Luisella that was dancing like a crazy
 person'
- b. Ho sentito Piero che cantava con i bambini
 'I heard Piero that was singing with the children'
- c. Lascio i bambini che giocano con il cane
 'I leave the children that play with the dog'
- d. Ho conosciuto Massimo che era molto nevrotico
 'I knew (met) Massimo that was very neurotic'

Translated non-literally the sentence in (20d), for example, means 'I knew (met) Massimo (during a period) in which) he was very neurotic.' Note first that in these sentences the (null) embedded subject must be coreferential with the matrix object. The sentence is ungrammatical on the interpretation in which the embedded null subject refers to someone other than Massimo. Second, the embedded subject must be null--even a coreferential pronoun results in ungrammaticality.

- (21) a. *Ho visto Luisella_i che lei_i ballava come una matta
 'I saw Luisella that she was dancing like a
 crazy person',¹¹

We will henceforth refer to these verbs as V_p verbs. Several analyses of the V_p verbs suggest themselves, including raising-to-object, relativization, and control.

Westphal (n.d.) argues that the sentences in (20) involve raising-to-object, i.e., the embedded subject is moved outside its clause to matrix object position. Within the framework we are assuming the rule of raising-to-object is ruled out by the Projection Principle and the θ -criterion.¹² Abstracting away from these principles, however, a raising-to-object analysis of the sentences in (20) is also excluded by the Binding Conditions since extraction of the subject of the tense embedded clause would leave an NP trace (an anaphor) free in its governing category (the minimal S dominating the trace).

A relativization analysis, while initially more plausible, can also be shown to be inadequate in several respects. Suñer (1982) provides persuasive evidence that the embedded sentences in (20) are not relative clauses. First, she notes that a relativization analysis would not account for the fact that the gap occurs only in subject position of the embedded clause, and never in object position. Thus the following sentences are not possible.

- (22) a. *Ho visto Maria che Gianni baciava [e]
 'I saw Mary that Gianni was kissing'
 b. *Ho lasciato Piero che il cane divertiva [e]
 'I left Piero that the dog amused'

This asymmetry is curious if the structures involve relativization since this operation is typically possible from both subject and object position.

Suñer further notes that the matrix object in these constructions may be cliticized as in (23).

- (23) a. L'ho visto che suonava la chitarra
'(I) him-saw that was playing the guitar'
b. L'ho lasciati che giocavano con il cane
'(I) them-left that were playing with the dog'

Again, a relative clause analysis would not account for the cliticization facts since the head of a relative clause may not normally be cliticized. Consider the following contrasts.

- (24) a. Voglio la torta che Maria ha fatto
'I want the cake that Maria made'
b. *La voglio che Maria ha fatto
'(I) it-want that Maria made'
c. Ho provato il vino che sta sul tavolo
'I tried the wine that is on the table'
d. *L'ho provato che sta sul tavolo
'(I) it-tried that was on the table'

- b. *Il vino è stato bevuto che sta sul tavolo
'The wine was drunk which is on the table'
- c. Ho persuaso Mario di andare dal medico
'I persuaded Mario to go to the doctor'
- d. Mario è stato persuaso di andare dal medico
'Mario was persuaded to go to the doctor'

With regard to passivization the V_p verbs again pattern with control verbs, as against relative clauses. The matrix object may be passivized, as in (28b).

- (28) a. Ho visto Maria che ballava con Giovanni
'I saw Mary that was dancing with John'
- b. Maria è stata vista che ballava con Giovanni
'Maria was seen that was dancing with John'

There is, however, a fourth respect in which V_p sentences behave like control structures. In Italian there exists a clitic pronoun--the impersonal si--which freely appears in tensed sentences. (si means roughly one or 'people in general.')

Consider the following sentences.

- (29) a. Si-va spesso al cinema in questa città
'One goes to the movies often in this city'

- b. Voglio che si-parta presto stasera
'(I) want that one leave early tonight'
- c. Ho visto che si-andava spesso al cinema durante
l'inverno
'I saw that one went frequently to the movies
during the winter'

Rizzi (1976) and Burzio (1981) note that the impersonal si may not appear in control structures. The following sentences are taken from Burzio (1981).

- (30) a. Giovanni sperava di trovare la soluzione
'Gianni hoped to find the solution'
- b. *Giovanni sperava di trovarsi la soluzione
'Giovanni hoped for one to find the solution'

Now note that the impersonal si is also impossible in sentences embedded under V_p verbs, though these embedded sentences are tensed.

- (31) a. *Ho visto uno che si-ballava
'(I) saw one that si-was dancing'
- b. *Ho sentito la gente che si-cantava
'(I) heard people that si-were singing'

In Section 4 we will examine the impersonal si construction in more detail and suggest an explanation for the ungrammaticality of (28b) and (29). At present, however, we wish merely to point out the parallel behavior of V_p verbs and control verbs with respect to impersonal si.

Thus the V_p verbs pattern like control verbs in at least four respects. First, the embedded clause may contain only a null subject, never a null object. Second, they allow cliticization of the matrix object; third, they allow passivization of the matrix object; finally, they do not allow an impersonal si in the sentential complement. The parallels are explained if the V_p verbs are in fact lexically specified as control verbs. There is, however, a question that immediately arises in connection with this proposal, namely, what is the element being controlled in these structures. Crucially, the embedded subject cannot be PRO since the position is governed, i.e., the embedded clause is tensed. We will argue that the controlled element is AG/PRO in INFL, and that AG/PRO is controlled by the matrix object of a V_p verb.¹³

It is a property of controlled PRO that it is assigned the reference of its controlling NP, just as anaphors are assigned the reference of their antecedents. It is in this sense that PRO is 'anaphoric.' Unlike the pure anaphoric empty element [e], however, PRO bears an independent Θ -role. In the sentence in (32), for example,

the Θ -role assigned to John is experiencer, while the Θ -role of the controlled PRO is agent.

(32) John wanted [PRO to play football]

In general, controlled PRO must bear a Θ -role, though it need not appear in a Θ -position, as is demonstrated by the sentence in (33).

(33) John wants [PRO_i to seem [[e_i] to be happy]]

Thus, if AG/PRO is controlled by the object of a V_p verb, it must bear a Θ -role. Let us assume that where AG/PRO is controlled, it absorbs the Θ -role which would otherwise be assigned to the subject NP. In essence, control of AG/PRO blocks Θ -role assignment to [NP,S] position. If no Θ -role is assigned to subject position, the element which appears there must be expletive. In English, the designated expletive element is it as in the sentences in (34).

- (34) a. It seems that John is very unhappy today
b. It rains a lot during the month of February

Recall that in Italian the designated expletive element is phonologically null. Thus in Italian the sentences in (34) are as in (35).

- (35) a. Sembra che Gianni sia molto infelice oggi
 'Seems that John is very unhappy today'
 b. Piove molto durante il mese di febbraio
 'Rains a lot during the month of February'

We henceforth assume that the element in subject position in the V_p sentences in (20) is the null expletive, which we have referred to as [ex]. Thus the structure of the sentences in (20) is as in (36).

- (36) Ho visto Maria_i che [[ex] [AG|PRO]_i ballava come una
 matta]

Suñer (1982) has also proposed that V_p sentences are control structures. On Suñer's analysis, however, the element in the embedded subject position is the referential pro, the same element which appears in simple tensed sentences. She further proposes that it is pro which is controlled, although pro is governed by and coindexed with AG. The structure which she assigns to these sentences is as in (37).

- (37) Ho visto Maria_i [che [proⁱ [AGⁱ] ballava come una
 matta]]

Suñer argues that her analysis of V_p verbs provides evidence against the assertion in Chomsky (1981) that 'pro

superscripted with AG is not subject to control.¹⁴ We will show, however, that Chomsky's claim is correct, and that Suffer's analysis raises several technical and conceptual problems which are avoided on the AG|PRO analysis.

The first problem that arises in connection with the controlled pro analysis concerns the appearance of pro in embedded subject position. Typically, wherever pro appears a lexical pronoun may also appear. This, of course, follows from the fact that pro is a pure pronominal. Thus, pro or a lexical pronoun may appear in both simple and embedded tensed sentences.

- (38) a. Vado al cinema
'(I) go to the movies'
b. Io vado al cinema
'I go to the movies'
c. Voglio che vada al cinema
'(I) hope that (he, she) goes to the movies'
d. Io voglio che lui vada al cinema
'I want that he goes to the movies'

Note, however, that if pro is the embedded subject under V_p verbs, this is the one instance in which the lexical pronoun option is excluded. Sentence (21) is repeated below.

- (39) *Ho visto Luisella che lei ballava come una matta
'I saw Luisella that she was dancing like a crazy
person'

Note that the absence of lexical NPs in the subject position of infinitival control structures follows from the fact that this position is Caseless, whence the ungrammaticality of (40).

- (40) a. *I tried I to go
b. *I persuaded John he to go

With V_p verbs, however, the Case problem does not arise since the embedded sentence is tensed. Thus, there is no apparent reason for the impossibility of lexical pronouns.

In general, the lexical pronouns and pro have a shared distribution; if the element in subject position is pro, there is no reason for lexical pronouns to be excluded. If, on the other hand, the subject position is not assigned a Θ -role, as we have argued, we expect neither pro nor a lexical pronoun to appear there since all referential pronouns require a Θ -role. Thus, the only element which may appear in this position is the designated expletive ex.

The second problem with the pro analysis is of a more conceptual nature. Recall that the defining characteristic of pro is that it is a pure pronominal (minus a

phonetic matrix). We therefore expect pro to behave like a lexical pronoun. The latter, however, may never enter into a control relation. Pronouns, unlike anaphors, do not require antecedents, though they may corefer with a c-commanding NP. Thus in the sentence in (41) the speaker may intend he and John to refer to the same entity, but crucially, coreference is not obligatory.

(41) John_i believes he_{$\left. \begin{array}{c} \{i\} \\ \{j\} \end{array} \right\}$} is in for a hard time

Strictly speaking, control is a lexical/structural phenomenon, while coreference, as in (41), more properly belongs to the domain of speaker's intentions. Conceptually, the two phenomena are distinct, and it is perhaps a weakness of the indexing procedure that this distinction is not captured.¹⁵ It seems then a conceptual error to equate a sentence like that in (41) where John and he bear the same index, with a structure of obligatory control, though this is precisely what is suggested by Suñer's analysis. Unlike he in (41), the embedded subject under V_p verbs may not be disjoint in reference from the matrix NP.

(42) Ho visto Luisella_i che pro_{$\left. \begin{array}{c} \{i\} \\ \{*\tilde{j}\} \end{array} \right\}$} ballava come una matta

Within the Government-Binding framework the fact that PRO may be controlled follows from independent principles

of grammar, and need not be stipulated as such. The Binding Conditions require that PRO be ungoverned; PRO therefore has no governing category. The theory of government defines the governing categories (NP,S) as opaque domains, i.e., domains within which anaphors must be found and pronouns must be free. The positions in which PRO may appear are 'transparent,' that is, accessible to outside control. The position in which pro appears, however, is opaque (the subject of a tensed clause), and hence inaccessible to outside control. The theory, as formulated, allows only one element to be controlled--PRO. Suñer's analysis thus raises another unanswered question, namely, why should the matrix object in V_p constructions control into an opaque domain, unlike all other instances of control.

To sum up, Suñer's analysis raises three problems. First, why may the pro subject under V_p verbs never be lexically realized? Second, why does the pro subject under V_p verbs require an antecedent, while lexical pronominals do not? And third, why does the object of a V_p verb control into an opaque domain? The AG/PRO analysis we are proposing engenders none of these problems. First, the subject position of the embedded sentence does not contain pro, but ex. Lexical pronouns may not appear there since the position is assigned no Θ -role. The second question does not arise under our analysis since the subject is not pro. As for the third question--why does the object of a

V_p verb govern into an opaque domain--the answer is straightforward--it does not. The object controls AG/PRO in INFL. INFL, like COMP and the subject position of infinitivals, is an ungoverned position. A V_p verb is lexically specified as assigning control to its object. The object will control the only element which is accessible to it, namely, AG/PRO. The situation is entirely parallel to control in infinitivals. In the sentences in (43) persuade is specified as assigning control to its object. The object Maria controls the only element accessible to it, PRO in the embedded subject position.

- (43) a. Ho persuaso Maria_i di [PRO_i andare al cinema]
 b. I persuaded Maria_i [PRO_i to go to the movies]

Although control into infinitivals is possible in both English and Italian, control into a tensed subordinate clause occurs only in those languages in which INFL contains AG/PRO. Thus, in English a sentence parallel to the Italian sentence in (42) is impossible.

- (44) *I persuaded Mary that should go to the store

In the sentence in (44) PRO may not appear in subject position of a tensed embedded sentence; moreover English INFL does not contain AG/PRO.

Thus, there is no controllable element (PRO) accessible to Mary, even though persuade assigns object control.

Control in V_p structures, like control in embedded infinitivals, requires that the controlled element be referential. In both cases, the θ -role of PRO is determined compositionally by the embedded VP, while the reference of PRO is determined by its controller. The only idiosyncratic property of these constructions, then, is that AG/PRO receives the θ -role which would otherwise be assigned to the element in [NP,S] position. The θ -role absorption by AG/PRO explains why neither pro nor a lexical subject may appear in [NP,S] position in these constructions.

On our analysis the control-like behavior exhibited by the tensed complements under V_p verbs results from the control of AG/PRO by the matrix object. In these constructions, AG/PRO is the only element accessible to control. The AG/PRO analysis does not engender the technical and conceptual problems which arise under the controlled pro analysis proposed by Suárez. We are able to maintain the PRO/pro distinction with respect to control, i.e., only PRO is accessible to control, while also accounting for the particular properties of V_p verbs. Most importantly, however, the V_p facts support the hypothesis that AG in pro-drop languages is PRO

In the section that follows we will discuss the second PRO-like property of AG, namely, that it may be arbitrary in reference.

3.1.2 Arbitrary Reference of AG/PRO

Suñer (1982) notes that under certain conditions the null subject of a tensed sentence may be interpreted as arbitrary in reference. The condition of the arbitrary interpretation is that the verb be inflected for 3rd person (masculine), plural.¹⁶ Thus, the sentences in (45) are ambiguous between a definite pronominal subject reading (they) and an arbitrary subject reading.

- (45) a. Bussano alla porta
'(They) are knocking at the door'
- b. Dicono che piovera domani
'(They) say it will rain tomorrow'
- c. Hanno confermato le notizie alla radio
'(They) confirmed the news on the radio'
- d. Se rubi quel negozio ti verranno a prendere senz'
altro
'If (you) rob that store (they) will come and get
you for sure'

On the first interpretation, the null subject in the above sentences has a definite pronominal reading and refers to

a specific group of people. For example, (45a) may mean 'John and Mary are knocking at the door.' On the second interpretation, although the verb is inflected for 3rd person plural, the subject is entirely indeterminate. The speaker need have no particular referent in mind. Thus (45a) is true even if only one person is knocking at the door. As Suñer points out, the subject of (45b) might be a meteorologist. Similarly, the subject in (45c) may be a lone newscaster, and (45d) is true even if only one policeman actually comes. Sentences like those in (45) exist in other pro-drop languages, for example Spanish (reported by Suñer), Hebrew, and Turkish.¹⁷ Crucially, the arbitrary interpretation is associated only with a null subject. If the subject is lexical, i.e., the pronominal they, the sentences may have only the definite reading.

Suñer proposes that the sentences in (43) contain a pro in subject position and that it is pro which is assigned arbitrary interpretation.

(46) pro bussano alla porta (=43a)

We will argue, in contrast to Suñer, that it is AG/PRO in INFL which is assigned arbitrary interpretation. A necessary condition for the arbitrary reference of AG/PRO, however, is that it be a referential expression. We thus propose that when AG/PRO is specified as [3rd person, masculine,

On Suñer's 'arbitrary pro' analysis, the impossibility of a lexical pronoun on the arbitrary reading is left unexplained. On her account, the element in subject position is pro in both interpretations. Given the shared distribution of pro and lexical pronouns, discussed earlier, a lexical pronoun should be possible wherever pro may appear. Insofar as Suñer provides no account of this uneven distribution, the AG/PRO analysis is to be preferred on empirical grounds.

There is, however, a second weakness in the controlled pro analysis. As Suñer notes, the arbitrary subject may not serve as an antecedent for reflexive or reciprocal anaphors. Thus the following sentence is grammatical only where the subject is interpreted as definite.

- (48) Hanno confermato le notizie l'uno a l'altro
'(They) confirmed the news one to the other (= to each other)

Similarly, though a verb like ammazzare (to murder) may take an arbitrary subject as in (49a), the arbitrary subject reading is excluded when the sentence contains the reflexive/reciprocal clitic si, as in (49b).

- (49) a. Hanno ammazzato Mario
 '(They) murdered Mario' (=arbitrary or definite they)
- b. Si sono ammazzati
 '(They) { themselves } murdered' (=definite they)
 { each other }

The Binding Conditions require that an anaphor be A-(=argument) bound in its governing category. On Suñer's analysis, the arbitrary pro should, in principle, be able to serve as an antecedent since the subject position is an A-position. In embedded infinitivals, for example, arbitrary PRO may bind an anaphor, as in (50).

- (50) a. Non è chiaro come PRO accontentarsi
 'It's not clear how to content oneself (=make oneself content)

Why then is this binding relation impossible with an arbitrary subject in (48) and (49)? On the AG/PRO analysis the impossibility of binding follows from the fact that the presumed binder, arbitrary AG/PRO, is not in an A-position. Thus, the ungrammaticality of (48) and (49) on the arbitrary subject interpretation is directly explained by the Binding Conditions; the anaphors are not A-bound. On the definite subject reading, it is pro in [NP,S] position which serves as an antecedent for the

anaphors si and l'uno l'altro. The AG/PRO analysis thus makes the correct predictions over a second range of data which are unexplained on Suñer's controlled pro analysis. The sentences in (45) demonstrate that AG/PRO exhibits the second property typically associated with PRO; it may be arbitrary in reference.

We turn now to the third property of PRO listed in (19)-PRO is ungoverned. The lack of government, recall, is the essential property of PRO which sets it apart from all other empty categories. In the section that follows, we will show that AG in pro-drop languages, i.e., AG/PRO, must also be ungoverned, and thus behaves like PRO in this respect as well. The requirement that AG/PRO be ungoverned explains certain differences in the auxiliary systems of Italian and English.

3.1.3 The Auxiliary Systems of Italian and English

One of the most noteworthy differences between the auxiliary system of pro-drop languages (Italian and Spanish) and English regards the position in which modals and auxiliaries are located. Phenomena such as 'subject-AUX inversion,' 'VP deletion,' tag questions, negative placement, and negative contraction provide considerable evidence that the English modals and auxiliaries may appear under a separate AUX constituent (Chomsky, 1958; Emonds, 1976; Fiengo, 1980). We assume that the modals are base

generated under AUX (Chomsky, 1957), while have and be may be raised into AUX from their base position in the VP (Emonds, 1976). Recall that on our analysis AUX is under INFL (see example (2)). In Italian the modals potere (can) and dovere (must) exhibit all the morphological and syntactic properties of main verbs,¹⁸ while the perfective auxiliaries essere (be) and avere (have) appear with the main verb under VP.

Unlike the English modals, which have a defective morphology, potere and dovere take the full range of verbal inflection for person, number, tense, and aspect. Syntactically, they exhibit the properties of 'raising' verbs like sembrare (seem). Rizzi (1976) observes that potere and dovere permit the impersonal si in their embedded infinitival complement, typically possible with raising verbs, and impossible with control verbs, as noted earlier.

- (51) a. Quelle case sembrano [potersi costruire con poche spese]
 'One seems to be able-si to construct these houses cheaply'
- b. Quelle cases devono (possono)[costruirsi alla svelta]
 'One must (can) construct-si these houses quickly'

- c. *Giovanni spera di [costruirsi la casa]
'Giovanni hopes for one to construct-si the house'

Like sembrare, potere and dovere may take non-referential surface subjects--the object of idioms like promettere mari e monti (to promise heaven and earth) and the subject of weather verbs like piovere (rain).

- (52) a. Mari e monti gli devono essere stati promessi
invano, a giudicare dal suo comportamento
'Heaven and earth to him-must have been promised
in vain, judging from his behavior.
- b. Mi potrebbe piovere sulla testa da un momento all'
altro
'It could (would be likely) to rain on my head any
minute'

Finally, Burzio (1981) notes that in raising constructions the quantifier each bound to an embedded object may appear in the matrix clause, while this is impossible in control structures.

- (53) a. One interpreter each seems to have been assigned
to the visiting diplomats
- b.*One interpreter each tried to be assigned to the
visiting diplomats

Italian exhibits the same contrast, and as expected, potere/dovere pattern like raising verbs. (Sentences from Burzio.)

- (54) a. Un interprete ciascuno potrebbe essere assegnato a quei visitatori
 'One interpreter each could be assigned to those visitors'
- b.*Un interprete ciascuno vorrebbe essere assegnato a quei visitatori
 'One interpreter each wants to be assigned to those visitors'

Thus, potere and dovere are raising verbs. The underlying structure of sentences containing these modals is as in (55).

(55) [[e] [dovere [NP V_{inf} (NP)]]]
 S NP VP S

The embedded subject (in a Caseless position) raises into the matrix subject position, triggering agreement with the matrix verb. Potere and dovere are thus main verbs (lexically specified as raising verbs) which are subcategorized for a sentential complement. Unlike the English modals, they are not generated under INFL.

Turning now to the perfective auxiliaries avere and essere (be), note that although these elements are somewhat more 'auxiliary-like' in their behavior, they do not generally appear under INFL. The auxiliaries immediately precede the participial form of the verb as in (56). (Transitive verbs take avere as auxiliary, while some intransitives take essere and others avere.)

- (56) a. Gianni è andato al negozio
'Gianni is gone to the store'
(=Gianni has gone...)
- b. Maria ha mangiato la mela
'Maria has eaten the apple'

As in English, the auxiliary receives the verbal inflection (for person and number). (The participle is sometimes inflected for gender; we return to this shortly.) In contrast to English, however, the auxiliary may not 'stand alone,' nor is it easily separated from the verbal participle. One may not, for example, form a tag-question with a stranded auxiliary.

- (57) a.*Gianni è andato al negozio, non è
b.*Maria ha mangiato la mela, non ha

In English, the negative marker appears between the auxiliary and verb. In Italian, however, the position of the negative element non is invariant in simple and composite tenses; it precedes the tense bearing element and may not be positioned between the auxiliary and participle.

- (58) a. John has not gone
b. Gianni non va stasera
'Gianni not goes tonight'
c. Gianni non è andato ieri sera
'Gianni not has gone last night'
d.*Gianni è non andato ieri sera

Similarly, the direct object clitic appears before the main verb in simple tenses, and before the auxiliary in composite tenses; it may not appear between the auxiliary and participle.

- (59) a. Gianni lo mangia
'Gianni it-eats'
b. Gianni lo ha mangiato
'Gianni it-has eaten'
c.*Gianni ha lo mangiato

The behavior of clitic and non strongly suggests that the auxiliary and verbal participle appear together under VP,

as does a particular agreement pattern found in these constructions. We mentioned earlier that the participle may sometimes be inflected for gender in agreement with the subject, while the auxiliary agrees with the subject in person and number. This happens when the auxiliary is essere, as in (60).

(60) I ragazzi sono partiti presto
 [3p.pl] [masc.plu]

'The boys are left early'

(=The boys have left early)

It seems reasonable to assume that this partitioning of subject agreement features takes place between elements within a single constituent.

That the auxiliary and verbal participle form a constituent is confirmed by their behavior with respect to certain transformational operations. For example, both elements 'disappear' under "VP deletion."

(61) a. Gianni ha visto quel film e Maria ____ pure

'Gianni has seen that film and Maria too'

b.*Gianni ha visto quel film e Maria ha ____ pure

'Gianni has seen that film and Maria has too'

Similarly, Italian has a rule which preposes a projection which includes the verb plus the auxiliary.

This rule is triggered by wh-movement (Torrego, 1982).
Crucially, the verb may not prepose without the auxiliary.
Consider the following contrasts.

- (62) a. Dove ha comprato Maria quel vestito
'Where has bought Maria that dress'
(=Where has Maria bought that dress)
- b. *Dove ha Maria comprato quel vestito
'Where has Maria bought that dress'
- c. Quando è andata Maria al negozio
'When is gone Maria to the store'
(=When has Maria gone to the store)
- d. *Quando è Maria andata al negozio
'When is Maria gone to the store'

Given all of the above evidence one might conclude that in Italian, modals and auxiliaries never appear under AUX, but there are facts which suggest that this conclusion is wrong. We refer in particular to an interesting array of data related to 'Subject-AUX inversion' (SAI).

Rizzi (1982) notes a significant contrast between tensed and tenseless auxiliaries in Italian inverted structures. In Modern Standard Italian the subject of a sentence may never appear between a tensed auxiliary and a verbal participle (or between a tensed copula and an adjective). The relevant examples, taken from Rizzi (1982), are given in (63).

- (63) a. Mario ha accettato di aiutarci
 'Mario has accepted to help us'
 b. *Ha Mario accettato di aiutarci
 c. Mario è disposto ad aiutarci
 'Mario is willing to help us'
 d. *E Mario disposto ad aiutarci

As is well-known, in English inversion of a tensed auxiliary (or modal) is fully grammatical. Sentences like those in (64) are typically taken as evidence of the AUX constituent status of the auxiliaries and modals.

- (64) a. Have you finished already
 b. Are you happy with the results
 c. Can you give me a hand

Returning to Italian, Rizzi has noted that when the auxiliary (or copula) is in the gerundive or infinitival form, inversion yields a grammatical output. This is illustrated in the sentences in (65). (From Rizzi, 1982.)²⁰

- (65) a. Avendo Maria accettato di aiutarci, potremo
 risolvere il problema
 'Having Maria accepted to help us, we can resolve
 the problem'

- b. Essendo Gianni disposto ad aiutarci, potremo risolvere il problema
'Being Gianni willing to help us, we can resolve the problem'
- c. Ritengo aver lui dichiarato alla stampa estera che la situazione è in rapido peggioramento
'I believe to have he declared to the foreign press that the situation is rapidly getting worse'
- d. Gianni sostiene non essere lui in grado di dare un contributo
'Gianni maintains not to be him able to make a²¹ contribution'

Note that the inversion in the sentences in (65) is not triggered by a wh-element, and hence not an instance of the 'verb preposing' discussed earlier, and illustrated in (62). Rather, Rizzi argues that the sentences in (65) are the output of a rule which moves AUX to sentence initial position. Modifying Rizzi's proposal slightly, we will assume that it is INFL which is preposed and adjoined to S. We further assume, following Safir and Pesetsky (1981), that 'Move INFL' is an instance of the general movement rule 'Move α .' On our analysis, the output of 'Move INFL' is constrained by the PF condition, given in (5), which bars the appearance of unbound affixes. Recall that in order to satisfy the PF filter, the AG features (and Tense

features) contained in INFL must hop onto an immediately adjacent verbal element, either in AUX, or in the VP (if AUX is not lexically filled). Note that if INFL contains only features (AG, Tense, or both), 'Move INFL' will have no grammatical output since the rule moves the affixes to a position which is non-adjacent to a verbal element onto which they may hop. This situation is illustrated in (66).

(66) [[AG] [Tense]] [I [e_i] [give John
 INFL_i AUX S INFL VP
 trouble]]

If 'Move INFL' does not apply, the featural contents of INFL may hop into the verb in the VP, since the adjacency condition is satisfied, as in (67).

(67) [I [[AG] [Tense] [give John trouble]]
 S INFL AUX VP

-

Where AUX contains a modal or auxiliary, 'Move INFL' is free to apply. The AG features may still hop onto the verbal element after the inversion has taken place. Tense, recall, is absorbed by the verbal element in AUX and is thus not 'free.'

(68) [[AG] [{ do }
 INFL_i AUX { may }] [I [e_i] [give John
 S INFL VP
 :
 trouble]]

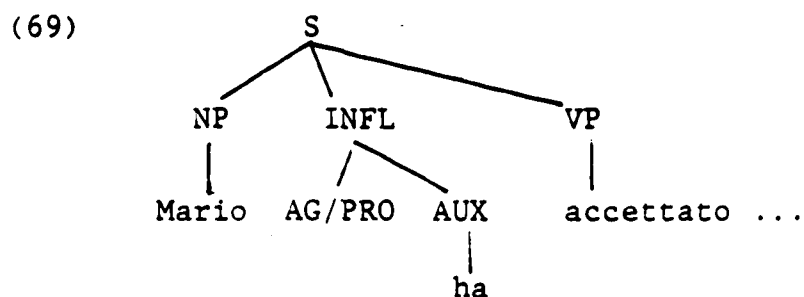
The above analysis is essentially a Standard Theory treatment of the 'subject-AUX inversion' phenomenon without the highly structured, language specific rule of 'Subject-AUX Inversion.' Movement is effected by 'Move α ,' instantiated as 'Move INFL,' and the output of the movement rule is constrained by an independently needed condition barring free occurrences of 'bound morphemes.'

Returning now to the English and Italian data in (63)-(65), note that the sentences in (64) are well-formed outputs of 'Move INFL.' Have and be, though generated in the VP, are free to raise into AUX, where they absorb the Tense features and provide an adjacent stem onto which AG may hop. 'Move INFL' is thus free to apply. Similarly, the modals (or do), as in the structure in (68), are base-generated in AUX, and 'Move INFL' again applies freely.

At first glance, the Italian data in (63) and (65) appear to require a more complex set of mechanisms than those proposed for English. This is not the case, however. In Italian, as in English, 'Move INFL' may apply freely, subject to the PF constraint on bound morphemes. The auxiliaries essere and avere are generated in the VP, but may raise into AUX. In the sentences in (65) the auxiliaries have been raised into AUX; 'Move INFL' applies freely. The question which now arises is, of course, what blocks the inversion in the sentences in (63)?

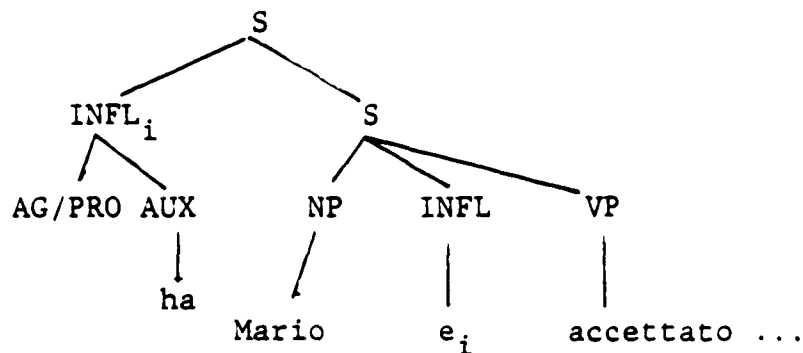
'Move INFL,' recall, may apply wherever AUX contains a verbal element which may serve as a stem. The

ungrammaticality of the sentences in (63) thus suggests that in these structures the auxiliaries essere and avere do not raise into AUX, since if they did there would be nothing to block the inversion. Note that there is one crucial difference between the sentences in (63) and those in (65); the former are tensed while the latter (gerundive and infinitival) are tenseless. Recall that in pro-drop languages tensed sentences contain AG/PRO in INFL, while gerundives and infinitivals do not.²² (In these cases, INFL is specified simply as [-tense].) The reason that the auxiliaries in (63) may not be raised into AUX is now clear. If they did, AG (= PRO) would be governed. The structure of (63a) prior to inversion is as in (69).



Application of 'Move INFL' will not save the structure since movement does not affect the internal structure of INFL. The inverted structure is given in (70).

(70)



Recall that by the Head Assignment Principle, given in (3), if AUX is lexical, AUX heads INFL. As a lexical head, the auxiliary ha in (69) and (70) governs AG/PRO. Strictly speaking, then, it is not inversion which is blocked in the sentences in (63). Rather, it is 'verb raising' into AUX which has created the ungrammaticality in the sentences in (63b,d). Similarly, the sentences in (63a,c) are grammatical where the auxiliary appears in VP, and ungrammatical where they have the structure in (69).

On the above analysis the contrast in grammaticality in the sentences in (63) and (65) is accounted for in a straightforward fashion. Italian and English do not differ with respect to application of the rule 'Move INFL'; the rule applies freely in both languages subject to the PF constraint on bound morphemes. The auxiliaries (and main verbs) have and be (avere and essere in Italian) are generated in the VP. The verbal elements may raise freely into AUX where INFL does not contain AG/PRO, i.e., in English and in tenseless sentences in Italian.²³ The

strikingly different inversion patterns in the two languages thus reduces to a single, independently motivated difference between the two languages. In Italian AG = PRO, in English it does not.

Before concluding our discussion of 'Move INFL,' we briefly consider the particular instance of this rule in which a modal is inverted. In English, the modals are generated in AUX; 'Move INFL' may therefore apply freely to generate structures of the form in (68). Previously, we noted that in Italian the modals potere and dovere are raising verbs, i.e., main verbs which are generated under VP. It appears, however, that these modals, like the auxiliaries avere and essere, may sometimes raise into AUX, where they undergo inversion. The following sentences are from Rizzi (1982).

- (71) a. Dovendo tuo fratello tornare a casa, non possiamo allontanarci molto
'Having (=musting) your brother to return home, we can't go very far'
- b. Ritengo dover tuo fratello tornare a casa²⁴
'I believe to have your brother to return home'

As our analysis predicts, the inversion with modals is only possible where the modal is in its gerundive or infinitival form, i.e., where INFL does not contain AG/PRO. A similar

inversion is not possible where INFL is [+tense], as in the example in (72).

- (72) *Deve tuo fratello tornare a casa
'Must your brother return home'

Where INFL is tensed, dovere may only appear in VP.

- (73) [Tuo fratello_i [[AG/PRO] [AUX]] [deve [[e_i]
S INFL VP S
tornare a casa]]]

That dovere is indeed inside the VP in (73) is demonstrated by the fact that it is fronted under 'Verb-preposing' and 'deleted' under 'VP deletion.'

- (74) a. A che ora deve tornare a casa tuo fratello
'At what time must to return home your brother'
b. Maria deve tornare alle 7 e Gianni pare
'Maria must return home at 7 and Gianni too'

Thus the modals in English and Italian, though semantically equivalent, are syntactically distinct. In Italian they are main verbs which are subcategorized for a sentential complement, while in English they bear the

syntactic function of Auxiliary. This variation with respect to the syntax of modals poses an interesting acquisition problem. On the basis of what evidence does the child determine the syntactic position of modals in his language? We return to this question in Chapter Three.

In the preceding sections we provided considerable evidence that AG in pro-drop languages is PRO. The pronominal AG licenses an empty category in subject position of tensed clauses (pro). Moreover, AG may be controlled, and it may be arbitrary in reference. Finally, it must be ungoverned. In the section that follows we discuss the impersonal si construction in Italian. This construction is a second instance in which AG is ARB, thus further supporting the hypothesis that AG is to be identified as PRO.

4. The Impersonal si

In Section 3.1.1 we briefly discussed the subject clitic si (meaning one or people) found in tensed matrix and embedded clauses in Italian.²⁵ The examples, given in (29), are repeated below for ease of exposition.

- (75) a. Si-va spesso al cinema in questa citta
'One goes often to the movies in this city'
- b. Voglio che si-parta presto sta sera
'(I) want that one leave early tonight'

- c. Ho visto che si-andava spesso al cinema durante
l'inverno
'(I) saw that one (people) went often to the
movies during the winter'

We noted that the impersonal si is impossible in both embedded infinitivals as in (76a) and in tensed clauses embedded under V_p verbs, as in (76b).

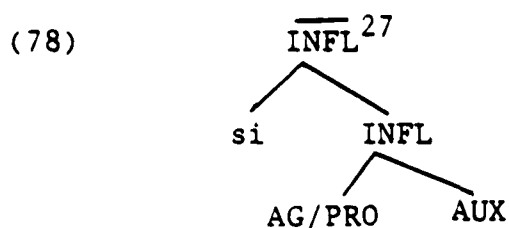
- (76) a.*Giovanni sperava di trovarsi la soluzione
'Giovanni hoped for si-to find the solution'
b.*Ho sentito la gente che si-cantava
'I heard the people that si-were singing

In this section we will provide an explanation for the ungrammaticality in (76). First, however, we must discuss the syntax of si in some detail.

Belletti (1982) argues that the impersonal si is a subject clitic generated under INFL which absorbs the Case and θ -role which would otherwise be assigned to the element in [NP,S].²⁶ Si is thus a referential clitic pronoun subject to both the Case Filter and the θ -Criterion. Since there is only one Case and one θ -role available for the subject, we find either si or a full NP in [NP,S], but not both.

- (77) a. La gente va al cinema
 'People go to the movies'
 b. Si-va al cinema
 'One (people) go to the movies'
 c.*La gente si-va al cinema
 'People si-go to the movies'

On Belletti's account si absorbs the Case feature from AG. Following very much in the spirit of Belletti's analysis, we will argue that si absorbs all of the features of AG, that is, along with the nominative Case feature, it also absorbs the features for person, number and gender, i.e., the ϕ features. On our analysis, si is, in effect, a "spelling out" of AG. We assume that si is generated in a structure of the following sort.



Following Belletti, we assume that si, which now bears the features of AG/PRO, also absorbs the Θ -role assigned to [NP,S] position. There are several consequences of these two absorption processes, to which we now turn.

First, note that because si absorbs the subject Θ -role, the element in subject position in the sentences in

We thus have a situation in which the verb is singular (mangia, vive), though the adjective is plural. Belletti has argued that in the impersonal si construction, the verb takes a "neutral" 3rd person singular ending. On our analysis this follows from the fact that the AG features have been absorbed by si and cannot therefore be morphologically realized on the verb.²⁸ Thus, in the impersonal si construction, the verb does not agree with si, which seems to bear the features masculine, plural. These features are precisely those which have been absorbed from AG/PRO.

Throughout this chapter we have argued that in pro-drop languages AG is PRO. One source of evidence for this analysis is that AG, like PRO, may be arbitrary in reference. In Section 3.1.2 we showed that sentences like those in (45) contain an arbitrary AG/PRO. (Sentence (45a) is repeated below.)

(81) Bussano alla porta
'(They) are knocking at the door'

Further evidence for the AG/PRO hypothesis is provided by the impersonal si construction. On our analysis, si is a "spelling out" of the AG features, and AG is PRO. By transitivity, then, si is a lexical realization of PRO. It seems reasonable to assume that as a

however, is now lexical, i.e., it is realized as si, and hence, by our assumption, not accessible to control.

4.1 The Middle si³¹

As noted earlier, in the middle si construction a transitive verb agrees with the logical object, and the sentence has a passive interpretation.³²

- (85) a. si mangiano i dolci in questa pasticceria
[3rd. per. plu.]
'si-eat sweets in this bakery'
(=sweet are eaten in this bakery)
- b. Da Hollywood si vedono bene le montagne
[3rd per. plu.]
'From Hollywood si-see well the mountains'
(= From Hollywood the mountains are seen well)

Following Belletti (1982), we assume that the middle si has the following properties:³³

- (86) (A) si absorbs the θ -role assigned to [NP,S]
(B) si absorbs accusative Case

Thus, the middle si differs from the impersonal si in that the former absorbs accusative Case, while the latter absorbs nominative Case (and the ϕ features of AG). Note

that the two properties given in (86) are precisely those which define the passive. Chomsky (1981) singles out the following two formal properties of passive.

- (87) (A) [NP,S] does not receive a Θ -role
(B) [NP,VP] does not receive Case within VP, for some choice of NP in VP

In a copular passive, it is the passive morphology which absorbs the Θ -role of [NP,S] position and the accusative Case assigned to [NP,VP] position. Consider the following structures.

- (88) a. [e] was hit Mary
 NP
 b. [e] è stata colpita Maria
 NP
 'was hit Mary'

In (88a) the accusative Case, otherwise assigned by the transitive verb hit, has been absorbed. Thus Mary must prepose into [NP,S] position to receive nominative Case. At the same time, no Θ -role is assigned to [NP,S]. Thus in (89) the subject Mary bears the Θ -role assigned to [NP,VP], that is, Mary is the logical object of the verb hit.

(89) Mary_i was hit [e_i]
NP

In English, the Case filter forces movement of Mary.

An analogous situation exists in Italian. In (88b) the subject θ -role has been absorbed, as has accusative Case. The NP Maria may prepose to receive nominative Case in [NP,S] as in (90).

(90) Maria_i è stata colpita [e_i]
'Mary was hit'

There is, however, a second option available in Italian. Recall that in Italian, nominative Case may be assigned directly to a post-verbal subject, that is, Rule R may apply in the syntax. Rule R hops AG onto the verb, where it governs the post-verbal NP. If the dual condition of government and agreement (AG must agree with the NP) is met, AG assigns nominative Case directly to the post-verbal element. Thus, there are two well-formed surface structures which may be derived from the D-structure given in (88b)-(90) and (91).

(91) è stata colpita Maria
'Was hit Mary'

The underlying structure of (91) is as in (92).

(92) [[ex] [AG + \bar{e} stata colpita Maria]]
S NP VP

Because there is no θ -role assigned to [NP,S] position, the empty category in that position is realized as ex.

Returning now to the middle construction, illustrated in (85), on Belletti's analysis these sentences are passives; that is to say that si fulfills the syntactic functions in (86), which are the defining properties of passive. Thus, the middle is a passive construction lacking passive morphology, hence the passive interpretation associated with these sentences.

In the sentence in (85a), for example, si absorbs the accusative Case which would otherwise be assigned to the post-verbal NP i dolci. This NP must therefore receive nominative Case. Evidence for the nominative status of i dolci is provided by the fact that this NP may not be replaced by an object clitic (which requires accusative Case).

(93) *li si mangiano³⁴
'them si-eat'

In order for i dolci to receive nominative Case, AG must be in the verb and thereby govern the NP.

Moreover, AG must agree in features with the NP to which it assigns nominative Case. Thus in the middle construction si does not absorb the ϕ features from AG, or Case assignment would be blocked. The underlying structure of the sentence in (85a) is as follows.

- (94) [[ex] [si] [AG + mangiano i dolci in questa
 S NP VP (3rd per. plu.)
 pasticceria]]

In (94) si has absorbed the Θ -role assigned to [NP,S] position and the subject position is occupied by ex. That the middle si does not absorb the ϕ features from AG is demonstrated by the fact that these features are spelled out on the verb.

The structure in (94) is analogous to the copular passive structure in (92). And just as in the copular passive, if Rule R does not apply in the syntax, the post-verbal NP may prepose into [NP,S] position to receive nominative Case. The sentence in (95a) is analogous to the copular passive in (90), and its underlying structure is given in (95b).

- (95) a. i dolci si mangiano in questa pasticceria
 b. [[i dolci] [si [AG AUX]] [mangiano [e_i]....]]
 S NP_i INFL INFL VP

To sum up, we have assumed, following Belletti (1982) that the subject clitic si requires a Θ -role and Case. In all cases, si absorbs the Θ -role assigned to [NP,S]. In order to satisfy the Case requirement, it absorbs either accusative Case or nominative Case. Where it absorbs accusative Case, we have a passive (minus passive morphology). Where it absorbs nominative Case it also absorbs the set of ϕ features on AG. In this instance, si is a lexical realization of arbitrary AG/PRO.

We will continue our discussion of si in Chapter Four, where we examine the properties of the impersonal and middle constructions in the developing grammar of Italian.

Appendix: Verbal Inflection:
A Morphological Parameter

In this section we consider the relationship between the abstract features in INFL (e.g., AG, Tense) and overt morphological inflection on the verb in Italian, English, and two dialects of northern Italy, Trentino and Fiorentino. We show that the above languages vary with regard to the particular features which are spelled out on the verb, and that this variation can be naturally described as an instantiation of different values along a single parameter.

In Chapter Two we have noted that in Italian AG is phonologically realized on the verb in the form of verbal inflection. Following is the present tense paradigm of the verb parlare (to speak).

(1)	<u>Singular</u>	<u>Plural</u>
	1st person: parlo	parliamo
	2nd person: parli	parlate
	3rd person: parla	parlono

Let us formalize the "spelling out" process as follows.

$$(2) \quad F_i + V \rightarrow F_i + V_i \quad (F=\text{features})$$

Henceforth, we refer to the rule in (2) as Rule I. In Italian F is instantiated as AG. Thus, in Italian, Rule I produces a phonological copy of the AG features directly on the verb, as follows.³⁵

$$(3) \quad AG_i + V \rightarrow AG_i + V_i$$

We assume that Rule I applies in the phonology, i.e., on the mapping from S-structure to PF. The element on the lefthand side of the rule in (3), AG + V, is the output of Rule R. We assume that the process is the same

in other languages in which the AG features are realized on the verb, for example, Spanish and German.³⁶

1. Trentino

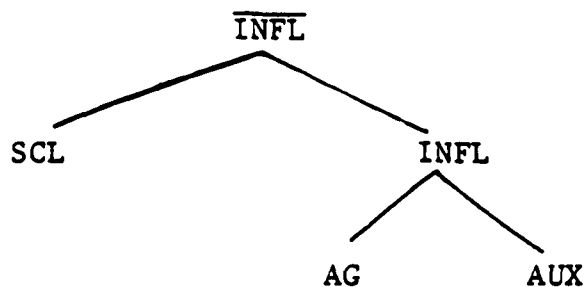
We turn next to Trentino, a dialect of Italian spoken in and around Trento, in the northeast corner of Italy.³⁷ Like most of the northern dialects, Trentino contains a set of pronominal subject clitics. These pronominal elements appear immediately preceding the verb, and are obligatory; that is to say, they occur whether or not a lexical subject is present.

- (4) a. Mario el-ven
'Mario he-comes'
b. Lu el-ven
'He he-comes'
c. el-ven
'he-comes'
d. *Mario ven
Lu
e. *Ven

Brandi and Cordin (1981) and Chomsky (1981) argue that the subject clitic (henceforth SCL) in these dialects is a lexical realization of AG. Following in the spirit of this proposal, Jaeggli (in preparation) argues that the

SCL in Trentino (and other Italian dialects) must absorb the features in AG. (Jaeggli further proposes that in the SCL dialects the AG features must "move" prior to S-structure; either they are absorbed by SCL, or they are hopped onto the verb via Rule R.)³⁸ When the SCL absorbs the features of AG, it constitutes the head of $\overline{\text{INFL}}$. As such, it governs and assigns nominative Case to a lexical subject, as in (4a,b). (We repeat below the structure of $\overline{\text{INFL}}$ presented in the previous section.)

(5)



Adapting Jaeggli's proposal to our own analysis, we will assume that the SCL is obligatory in Trentino (and Fiorentino) because $\text{AG} \neq \text{PRO}$. Thus, it is the SCL which licenses a pro in $[\text{NP}, \text{S}]$ position in (4c). On this analysis, the ungrammaticality of the sentence in (4e) follows from the fact that there is no element in $\overline{\text{INFL}}$ which licenses a pro in $[\text{NP}, \text{S}]$ position; the SCL is absent, and $\text{AG} \neq \text{PRO}$, by hypothesis.³⁹ The sentence in (4d), in contrast, is a violation of the Case Filter. By Jaeggli's

stipulation (noted above) AG must either be in SCL or in V at S-structure in this language. The absence of the SCL in (4d) entails that AG is in V, and hence, unable to assign Case to the element in [NP,S].

We assume that the SCL (generated under INFL) is unaffected by Rule R, which hops only the contents of INFL. On our analysis, the SCL is cliticized onto the verb by means of a distinct rule--let us call it "Hop SCL." The effect of Hop SCL is illustrated in (6).

(6) Mario [el] [ven] → Mario [el + ven]
 INFL VP VP

Returning now to the absorption of ϕ features by SCL, recall from our discussion of si, that this absorption operation has several consequences. First, if AG is absorbed by the SCL, it cannot hop into the verb and hence, there can be no nominative Case assignment to a post-verbal subject. We expect then that SCLs and post-verbal subjects will be in complementary distribution. This is confirmed by the following contrast.

(7) a. Mario el-ven (= 3a)
 b. *el-ven Mario
 c. Ven Mario

- (9) a. Te-vegni
 [2nd per. sing.]
 'You come'
 b. el-ven
 [3rd per. sing.]
 'he-comes'

The question which arises in connection with the sentences in (9) is what is the source of the inflection on the verb, or, more properly speaking, what are the features in Trentino which enter into Rule I. By hypothesis, they cannot be the ϕ features in AG since these have been absorbed by the SCL. The obvious candidate is the set of ϕ features which are now contained in the SCL. Recall that the SCL cliticizes onto the verb by the rule of Hop SCL, which is distinct from Rule R. Thus the output of Hop SCL serves as input to Rule I. This amounts to the claim that in Trentino it is the features in the subject clitic which trigger agreement on the verb, and not the features in AG (as in Standard Italian). This hypothesis can be easily tested. We expect that where the SCL is absent (i.e., in sentences containing a post-verbal subject) the verb will not bear agreement inflection. This is in fact the case. In order to see the phenomenon clearly, however, we must diverge briefly to discuss certain aspects of the morphology of Trentino which we have thus far ignored.

In Trentino the 3rd person singular and 3rd person plural forms of the verb are homophonous.

- (10) a. La putela la-ven
'The girl she-comes'
b. Le putele le-ven
'The girls they-come'

However, when the verb is in its participial form, it bears the number and gender of the subject.

- (11) La putela l'ei venuda
[fem. sing.]
'The girl she-has come'

By our hypothesis, the agreement on the verbal participle in (11) is triggered by the feminine singular SCL le. (Note that *le* → *l'* before a vowel.) Now note that when the subject is post-verbal (and thus the SCL is absent) the participle does not bear agreement inflection, although AG is in V (as evidenced by the post-verbal subject).

- (12) E vegnu 'na putela
'Has come a girl'

The sentence in (12) supports the hypothesis that it is the SCL in Trentino which triggers agreement on the verb, and not AG. Thus, Standard Italian differs from Trentino in that in the former, F in Rule I is instantiated by the features in AG, while in the latter, F is instantiated by the features in SCL, as in (13).

(13) $F_i + V \rightarrow F_i + V_i$ where $F_i = \text{SCL}$

2. Fiorentino

Let us now briefly discuss a second dialect of Italian, Fiorentino, which is spoken near Florence. Fiorentino is very much like Trentino with respect to the SCL facts we are considering. The subject clitic is obligatory with or without a lexical subject.

- (14) a. Le ragazze le-vengono
 'The girls they-come'
 b. Le-vengono
 'They-come'
 c.*Le ragazze vengono
 'The girls come'
 d.*Vengono

The analysis of the Trentino sentences in (4) extends straightforwardly to the Fiorentino sentences in (14).

There is, however, one respect in which the two dialects differ. In Fiorentino when the subject is post-verbal we find a SCL e' in pre-verbal position.

- (15) a. E'-viene la ragazza
'SCL-comes the girl'
b. E'-viene le ragazze
'SCL-comes the girls'

Note that the SCL e' remains invariant regardless of the number and gender of the post-verbal subject. This is in marked contrast to sentences with pre-verbal subjects, in which the clitic varies according to the number and gender of the subject.

- (15) a. Le ragazze le-vengono (=14a)
b. La ragazza la-viene
'The girl she-comes'
c. Il ragazzo e'-viene
'The boy he-comes'

Note furthermore that the SCL e' in (15) is the "neutral" 3rd masculine singular form of the clitic (as in 16c). We may account for the contrast between the two dialects in the following way. In Fiorentino, as in Trentino, the ϕ features in AG must hop into the verb in

order to assign nominative Case to the post-verbal subject. Thus, in both dialects the SCL position is devoid of ϕ features in post-verbal subject constructions. Fiorentino differs from Trentino, however, in that in the absence of ϕ features the SCL is realized as the neutral e'. Because e' is not a "spelling out" of AG features, it is invariant across subjects bearing distinct features, as in (15a,b).

Fiorentino and Trentino do not differ with regard to Rule I, however. In both dialects it is the SCL, and not AG, which triggers agreement on the verb. This is demonstrated by the sentences in (15). In the sentences in (15) the verb contains the ϕ features of AG (which assign nominative Case to the post-verbal subject). Note, however, that the verb is marked 3rd person singular in both (15a,b), although the subject is plural in (15b). As in Trentino, the verb assumes the neutral 3rd person singular form because the SCL is void of features. Let us conclude our discussion of Fiorentino by noting that this dialect instantiates Rule I as in (13).⁴⁰

3. Locational ci in Standard Italian

The realization of SCL as e' in Fiorentino has a (rough) counterpart in Standard Italian. The standard dialect contains a subject clitic ci (not to be confused with si) which is roughly equivalent in meaning to

English there. We follow Burzio (1981) in referring to this element as the 'locational ci.' Some examples follow.

- (17) a. Ci sono due ragazze nella fotografia
'There are two girls in the photograph'
b. C'è molto smog in questa città (ci + è + c'e)
'There is a lot of smog in this city'
c. Ci sono io in cima⁴¹
'There am I at the top'
(=There's me at the top)

There are several things to note about the above sentences. First, the subject is post-verbal; second, the verb is inflected to agree with the subject; and third, ci is expletive (like English there). The first two facts provide clear evidence that AG appears on V at S-structure, where it assigns nominative Case to the post-verbal subject and triggers verbal agreement. In contrast to si, the expletive ci does not absorb the subject θ -role (which must be assigned to the post-verbal subject). Moreover, 'locational ci' differs from impersonal si, and from the SCLs in Trentino and Fiorentino, in that it is not a spelling out of AG features. We will thus assume that ci is a realization of an empty SCL node, analogous to Fiorentino *e*.⁴²

4. English

In this final section we discuss the behavior of English vis-a-vis Rule I. We will show that in English F is instantiated as Tense.

English has a relatively poor inflectional system (as compared to the languages thus far discussed). We have the -s morpheme realized in the sentence in (18a), and the -ed morpheme, realized in (18b)

- (18) a. John dancess very well
b. John danceded all night long.

While the status of -ed as a past-tense marker is uncontroversial, the identity of -s is somewhat less clear. The -ed morpheme is invariant across subjects, while -s appears only with a 3rd person singular subject. Given a sentence like (18a), in which INFL is marked [+present] and [+3rd person singular] (these are the features in Tense and AG, respectively) we do not know which of these features -s reflects. It is therefore necessary to find examples in which AG and [+tense] are teased apart. As we noted earlier (Note 2), [+tense] always appears with AG. There are, however, instances in which AG appears without the [+tense] feature. Picallo (1983) argues that the feature specification for subjunctive clauses is [+AG, -Tense]. If -s is a realization

of AG we expect it to be present in subjunctive clauses; if, on the other hand, it is a realization of [+tense], it will not appear in these clauses. In English, there exists a small set of verbs which take subjunctive complements, for example, require, ask, demand, etc. Now note that the embedded sentences in the examples in (19) lack the -s morpheme.

- (19) a. I demand that he leave at once
 b.*I demand that he leaves at once
 c. I {require} that the student hand in his homework
 {ask} on time
 d.*I {require} that the student hands in his
 {ask} homework on time

The subjunctive facts strongly suggest that -s is a (defective) present tense marker. In English, then, F is instantiated as Tense.

$$(20) F_i + V \rightarrow F_i + V_i \quad \text{where } F = \text{Tense}$$

The verbal inflectional process characterized by the rules in (3), (13), and (20) is to be factored into two parts--a general (i.e., Universal) rule which copies some set of features F onto the verb, Rule I, and a

language particular rule which instantiate F as AG, SCL, Tense, etc. What we have then is a multi-valued morphological parameter. The task of the language learner is to determine the value of F in his language.

In Chapter Four we will discuss verbal agreement in the language of young Italian and English speaking children. We wish, however, to anticipate that discussion by noting that English-speaking children acquire the -s and -ed morphemes at the same stage of development (Brown, 1973). This is precisely what is predicted by a parameter setting model of language development. We expect the appearance of both the present and past tense markers at the point at which the child determines the value of F in English, i.e., $F = \text{Tense}$.

Notes to Chapter Two

¹In Chapter Three (Appendix) we will suggest that the obligatoriness of the subject position in adult grammars follows from the operation of certain grammatical principles on the developing grammars.

²We may represent this by redundancy rule.

(i) [+tense] → [+AG]

Note that the converse does not hold. We may have AG in the absence of [+tense]. See Note 9, Chapter One.

³The spell-out rule (which we discuss in the Appendix) applies on the mapping from S-structure to PF. (See diagram in example (8) in the main body of Chapter Two.)

⁴After Rule R applies, the AG features are part of the head verb, and thus govern the element in post-verbal position.

⁵We assume, following Chomsky (1981), that the adjoined VP constitutes the maximal projection, and hence, that the post-verbal NP is within the governing domain of V.

⁶Based on observations in Rizzi (1980), Safir (1982) argues that 'phonologically null expletives must be governed.' This statement is intended to capture the fact that null expletives may not appear as the subject of infinitives or gerunds (an ungoverned position) in English (and French). The relevant (English) examples follow. (Sentences from Safir.)

(i) *Being obvious that John was late, we decided to go to the movies

(cf. It being obvious that John was late, ...)

(ii) *Before seeming that John was late, a big birthday party was planned

(iii) *To seem that John is guilty would upset Mary

(cf. For it to seem that John is guilty...)

⁸On our analysis, the possibility of post-verbal subjects (free inversion) and the null subject phenomenon follow from separate parameters. (This contrasts with the analyses in Jaeggli (1980) and Chomsky (1981), in which free inversion follows as an effect of the Pro-drop Parameter.) As specified in the text, on our analysis free inversion is related to the parametric variation associated with Rule R, while the possibility of having null subjects follows from the AG/PRO parameter. In separating these two phenomena we follow Safir (1982), although we depart from him in matters of execution. Safir observes that in separating the two phenomena one predicts the existence of languages which allow null subjects but not free inversion, and conversely, languages which allow free inversion, but which are not strictly speaking 'pro-drop' languages. As an example of the former, he cites Portuguese (following Chao (1980)), and of the latter, certain dialects of Northern Italian, which require pronominal subject clitics. In the Appendix to this chapter, we discuss two of these dialects, Trentino and Fiorentino.

⁹The term "transparent" was first adopted in Chomsky (1980) to describe those syntactic positions which are outside the c-command domain of subject and [+tense].

¹⁰I am grateful to Rita Manzini and Sandro Duranti for their help with the Italian data in this section.

¹¹For reasons which are not clear to us, some speakers marginally accept a coreferent pronoun in embedded subject position with the verb conoscere, as in (i).

(k) Ho conosciuto Maria che lei era molto nevrotica

¹²Chomsky (1981) observes that the rule of 'raising to object' is ruled out in the following manner. By the θ -Criterion, the raised element must be in a θ -position at D-structure. However, the object position to which the element is raised must also be a θ -position since sub-categorization entails θ -marking. (See Appendix to

Chapter One.) The raised element is thus doubly θ -marked at S-structure and LF in violation of the θ -Criterion.

¹³Borer (1983) independently argues that all instances of control are into INFL as opposed to the embedded subject position. Her analysis differs from ours in the manner in which the control relation is implemented. The reader is referred to the above cited paper for further discussion.

¹⁴More precisely, Chomsky claims that 'PRO superscripted with AG is not subject to control.' Following Jaeggli (1980), Chomsky (1981) argued that there are two PROs--controlled (or arbitrary) PRO which bears the index of its controller (a subscript), and a second which appears in subject position of tensed sentences in pro-drop languages. The latter is cosuperscripted with AG, has since been renamed pro (Chomsky, 1982). In the text we have taken the liberty of altering Chomsky's statement to reflect the change in terminology.

¹⁵Within the Government Binding framework, a controlled PRO and its controller are coindexed in precisely the manner of pronoun and its c-commanding coreference NP.

- (i) John_i wants [PRO_i to leave the party early]
- (ii) John_i believes that [he_i is crazy]

The Theory of Control requires that PRO in (i) bear the index of John, while there is no principle of grammar which requires that he in (ii) is pragmatically determined much in the way the reference of he is determined in (iii).

- (iii) I saw John yesterday. He looked very unhappy

Thus in (ii) we might equally well assign he the index j and have the pragmatic theory determine that $i = j$.

Note that the indexing algorithm in On Binding (Chomsky, 1980), while considerably more complex than the GP indexing procedure, did distinguish between the two cases, in more or less the manner outlined above. (See Chomsky, 1980, for details.)

¹⁶Verbs in Spanish and Italian are inflected only for person and number; gender is left unspecified (except in participles). We have included the feature 'masculine' in order to include the cases in which an adjective also appears. Adjectives are inflected for gender. When an arbitrary subject sentence contains an adjective it must be masculine plural. If the adjective is feminine the arbitrary reading is excluded. Thus (ii) is ungrammatical on the arbitrary reading.

(i) *llamaron furiosos* alla puerta
[masc. plu.]

(ii) **llamaron furiosas* alla puerta
[fem. plu.]

'(They) knocked furious at the door'

¹⁷The Hebrew data are reported in (Borer, 1981). The Turkish facts were brought to my attention by Murvet Enç.

¹⁸Although *potere* and *dovere* behave morphologically and syntactically like verbs, they have a distinct thematic (argument) structure. Zubizarreta (1982) argues that in certain languages, including English and Italian, modals may function as "adjunct predicates," while verbs are "argument-taking predicates." We thus use the term "modal" to refer to the class of elements which have this particular thematic structure.

¹⁹"Tag questions" in Italian are formed by adding the expression, *non è vero* (Isn't it true?) to the end of a sentence.

²⁰Inversion in these cases is not only possible, but may in fact be obligatory. Rizzi states that "the ordering NP AUX ... [as in (i)] is unacceptable for many speakers and very marginal for others." (p. 83).

(i) *(?) Mario avendo accettato di aiutarci

He argues that the obligatoriness of inversion in these cases is due to the fact that the subject of infinitivals

and gerunds is Caseless. He suggests that the grammar of Italian has a special Case assignment rule which assigns Nominative Case to an NP in post-AUX position.

- (ii) Assign Nominative Case to NP in the context
AUX _____

AUX must invert or the sentence is ruled out by the Case Filter, i.e., the requirement that all lexical NPs receive Case. Henceforth, we assume Rizzi's account of the obligatoriness of AUX inversion in these instances, although we will focus our attention on the fact that inversion is possible with gerunds and infinitivals, and impossible with tensed auxiliaries.

²¹Rizzi notes that these inverted sentences are of a rather formal style, the gerunds being less formal than the infinitivals. There are three other possible environments in which the inversion rule may apply in Italian; in nominal-infinitival constructions, containing a determiner (definite article) followed by an infinitive, as in (i); certain adverbial infinitives introduced by a preposition, as in (ii); in subjunctive clauses, as in (iii). (Sentences from Rizzi, 1982.)

- (i) L' [aver lui affermato che ti vuole aiutare]
non implica che sei fuori dai guai

'The to-have he/him asserted that he wants to help you does not imply that you are out of trouble'

- (ii) Il giudice è stato sospeso per [aver suo figlio
commesso una grave imprudenza]

'The judge has been suspended for to-have his son made a grave imprudence'

- (iii) Avesse lui capito al volo, tutto sarebbe
andato bene

'Had he understood quickly, everything would have gone smoothly'

Note that the analysis which we present in the text will account for the inversion in the two infinitival constructions, exemplified in (i) and (ii); it does not, however, extend to the subjunctive construction.

²²That infinitivals and gerunds do not contain AG/PRO is demonstrated by the fact that sentences like those in (65) may not have a pro subject.

(i) Avendo accettato il lavoro, possiamo cominciare subito

'Having accepted the job, (we) can begin immediately'

(ii) Gianni sostiene non essere in grado di dare un contributo

'Gianni believes not to be able to make a contribution'

In the above sentences, although the subject of the gerund in (i) and infinitive in (ii) may be null, they may not have the independent pronominal reference associated with pro. Thus (i) cannot mean 'She having accepted the job, ...'. Similarly, (ii) cannot mean 'Gianni believes us (you, here, me, etc.) to be unable...'. The only available interpretation is one of control. The subject of the gerund must be interpreted as we, while the subject of the infinitive must be interpreted as Gianni. Thus the null subject is controlled PRO.

The impossibility of pro in gerunds and infinitivals is interesting given that lexical subjects may appear in these constructions, eg., the sentences in (65). The presence of lexical subjects shows that the position receives both a Θ -role and Case (see Note 20), both of which are required by pro. Unlike lexical NPs, however, pro must be governed by AG/PRO. Thus the crucial element missing in gerunds and infinitivals is AG/PRO.

Note finally that because the subject is PRO in (i) and (ii), avere and essere may not be raised into AUX, but must remain in the VP. (In Note 23, we discuss a similar situation in English.)

²³It is a well-known fact that modals are impossible in infinitival constructions in English, as in (i). (We assume 'to' to be an infinitival marker generated on the verb, although this is irrelevant to the present discussion.)

(i) *I hoped may to-leave the party early

(cf. I hoped to be able to leave the party early)

The analysis proposed in the text, whereby a modal or auxiliary in AUX is a governor accounts for the ungrammaticality in (i) in a straightforward fashion. The embedded subject in (i) is PRO. By the definition of government given earlier the modal in AUX governs the [NP,S] position since S is the maximal projection of AUX. Thus, (i) is ruled out by the principle which requires that PRO be ungoverned. The underlying structure of (i) is given in (ii).

(ii) I hoped[[PRO] [[may]][to-leave the party]]
 S NP INFL AUX VP

In contrast to modals the auxiliaries have and be appear freely in embedded infinitivals.

(iii) I hope to have left by the time John arrives
(iv) I hope to be working next year

If have and be are dominated by AUX in these constructions, they too would govern the PRO in embedded subject position and (iii) and (iv) would be marked ungrammatical, contrary to fact. There is evidence, however, that these auxiliaries have not been raised into AUX. Akmajian, Steele and Wasow (1979) and Fiengo (1980) observe that the negative element not may contract onto have when it appears in AUX. Consider the following contrast.

(v) You have not heard the news → You haven't heard the news

(vi) You must have not heard the news → *You must haven't heard the news

Now note that when perfective have appears in infinitivals negative contraction is blocked.

(vii) I hope to have not left when John arrives →
 *I hope to haven't left when John arrives

The impossibility of contraction in (vii) follows from the fact that have appears in the VP, as in (vi). (Unfortunately, a similar test is not available for be.) In (vi) have may not raise into AUX since the position is occupied by the modal must; in (vii) the raising of have is blocked by the requirement that PRO (in [NP,S]) be ungoverned.

²⁴ According to Rizzi, this sentence is marginal (as compared to the sentence in (71a), for example). He notes, however, that it is more acceptable than the following sentence in which a non-modal is inverted.

- (i) *Ritengo raccontare tuo fratello questa storia
'I believe to tell your brother a story'
(= I believe your brother to tell a story)

Although we have no explanation of the marginality of (71b), the contrast in grammaticality between it and (i) above, provides support for the claim that the modals in Italian are distinct from verbs in their ability to raise into AUX.

²⁵ There is a second si construction in Italian, in which a transitive verb agrees with its logical object, as in (1).

- (i) Si mangiano i dolci in questa pasticceria
[3rd per. plu.]
'si-eat sweets in this bakery'
(=Sweets are eaten in this bakery)

As indicated in the gloss, these sentences have a passive interpretation. Following Manzini (1982), we refer to sentences like those in (i) as the 'middle' construction. We reserve the use of the term 'impersonal si' for sentences of the sort illustrated in the text, which have an active interpretation. Note that the impersonal si may also be used with transitive verbs (Belletti, 1982), as in (ii).

- (ii) Da Hollywood, si vede bene le montagne
[3rd per. sing.]
'From Hollywood, one sees the mountains well'

In (ii) the verb does not agree with the (plural) object, and the sentence does not have a passive interpretation like the sentence in (i), for example. The acceptability of the impersonal si with transitive verbs, however, is subject to a great deal of dialectal variation. Many Italian speakers judge the sentence in (ii) ungrammatical. These speakers seem to require that the transitive verb be inflected to agree with the logical object, i.e., they accept only the middle interpretation. Given the relative unacceptability of the impersonal si with transitive verbs, we use only intransitives in the text. We will discuss the middle construction in Section 4.1

²⁶The status of si as a subject clitic can be verified by considering the position of si with respect to the negative element and other (object) clitics. Unlike full NP subjects si appears following the negative marker, and between an object clitic and the verb.

(i) Non si mangia spesso in ristorante

'Not one-eats often in restaurants'

(ii) La gente non mangia spesso in ristorante

'People not eat often in restaurants'

(iii) (Le montagne) le si vede bene da Hollywood

'(The mountains) them-si see well from Hollywood'

The sentence in (iii) si appears with a transitive verb. It is interesting to note that when the object is cliticized the sentence is judged grammatical, even by those people who do not accept the impersonal si in transitive constructions with a full lexical object. (See Note 25.)

²⁷The structure in (78) and the analysis of si as absorbing the ϕ features of AG is adapted from work (in progress) by Osvaldo Jaeggli on personal subject clitics in several dialects of Northern Italian. We discuss the subject clitics in these dialects in the Appendix to this chapter.

²⁸In an earlier version of Belletti's (1982) paper, she proposed a similar analysis, namely, that si is AG and hence not realizable as verbal inflection.

²⁹Burzio (1981) argues that si may not appear in embedded infinitivals because it always requires nominative Case. This analysis, however, will not account for the ungrammaticality of si in tensed clauses embedded under V_P verbs. See Belletti (1982) for further arguments against the Case account proposed by Burzio.

³⁰Note that the "middle" si is also impossible in embedded infinitivals, although it does not absorb the features of AG. The middle si does, however, require Case, as does the post-verbal NP, in (i).

(i) *Giovanni sperava di trovarsi la soluzione

In infinitivals no nominative Case is available, and hence either si or la soluzione will remain Caseless, in violation of the Case Filter. We discuss the middle in the following section.

³¹Although the middle si construction is not directly relevant to the AG/PRO analysis, we have chosen to discuss it in this section because it is closely related to the impersonal si, and because an understanding of the middle will be useful when we examine the acquisition of si by Italian-speaking children in Chapter Four.

³²See Note 27.

³³Belletti (1982) refers to this construction as the 'impersonal passive.'

³⁴As illustrated in Note 25, the direct object in an impersonal si construction may be cliticized.

(i) (Le montagne) le si vede bene da Hollywood

Thus in the impersonal construction the post-verbal NP is a direct object bearing accusative Case, while si absorbs nominative Case from AG, as argued earlier.

³⁵Strictly speaking, the inflectional ending on Italian verbs is a realization of both AG and Tense features. Thus, F is instantiated as AG and Tense. In Italian, the paradigm of the imperfect tense (given below),

for example, is distinct from the paradigm given in (1) in the Appendix.

- (1) parlavo (1st. per. sing.) parlavamo (1st. per. plu.)
parlavi (2nd. per. sing.) parlavate (2nd. per. plu.)
parlava (3rd. per. sing.) parlavano (3rd. per. plu.)

In comparing the present and imperfect paradigms, we clearly see the effects of the Tense features. However, because we are primarily interested in the variation related to the morphological realization of AG, we will abstract away from the Tense features in our discussion of Italian and the Italian dialects.

³⁶It appears generally true that in language with a pronominal AG, the ϕ features tend to be morphologically realized on the verb. However, this is not a necessary condition, as is clear from languages like German and Dutch which have a rich system of verbal inflection, but which are non-pro-drop languages.

³⁷The Trentino and Fiorentino data are from Brandi and Cordin (1981).

³⁸On Jaeggli's analysis the absorption of features by SCL is actually an instance of Rule R (which may apply to the right [into V], or to the left [into SCL]). He further proposes that Rule R is parameterized such that it applies only in the phonology (as in English), in both the phonology or the syntax (Standard Italian), or only in the syntax (the SCL dialects).

In our analysis, we have been treating the absorption process as distinct from Rule R. As far as we can tell, nothing in the account of subject clitics hinges on this distinction.

³⁹Trentino (and Fiorentino) are thus languages which are non-pro-drop in our sense, i.e. AG \neq PRO, but which allow post-verbal subjects (we come to this shortly), suggesting that these two phenomena are separate, as argued in Safir (1982). See note 8.

We should also note that our analysis of the SCL dialects predicts the possibility of AUX inversion in these languages (in contrast to Standard Italian) since if AG \neq PRO, there is nothing to block the auxiliary from raising into AUX. Examples follow. (From Brandi and Cordin, 1983.)

(i) A-lo magna? (Trentino)

'Has he (clitic) eaten?

(ii) E-la vegnuda, la Maria? (Fiorentino)

'Has she (clitic) come, Maria?

⁴⁰In note 36 we noted that there is a tendency for a pronominal AG, i.e., AG/PRO to be morphologically realized. The Trentino and Fiorentino facts suggest, however, that there is a broader generalization, namely, that the pronominal element (AG or SCL) which licenses a null subject tends to be morphologically realized.

⁴¹The verb essere (be) assigns nominative case to the element in post-verbal position. Thus, the pronominal subject in (17c) is the nominative io. This contrasts with English locative sentences in which the post-verbal NP is accusative.

(i) There's me (in the photograph)

(ii) *Ci sono me nella fotografia

⁴²Burzio (1981) argues that ci requires nominative Case. This contrasts with our claim that ci is void of features. The basis for Burzio's claim is that ci may not appear in embedded infinitivals. (The following sentences are from Burzio.)

(i) *Lo spettacolo ha avuto luogo senza esserci molta gente

'The show took place without there-to be many people'

(ii) *Giovanni sperava esserci Maria

'Giovanni hoped there-to be Maria

As Ritz Manzini (personal communication) has pointed out however, the ungrammaticality of the examples in (i) and (ii) may equally well be due to the fact that in the embedded clause there is no nominative Case available for the post-verbal subject, molta gente in (i), and Maria in (ii). Thus, the evidence that ci requires nominative Case is not persuasive.

CHAPTER THREE

THE AG/PRO PARAMETER IN EARLY GRAMMARS

1. Introduction

In the last chapter we began our discussion of the pro-drop phenomenon by noting that English-speaking children frequently produce 'subjectless' sentences¹ like those in (1).

- (1) play it
eating cereal
shake hands
see window
want more apple
no go in

(Bloom, Lightbown & Hood, 1975; henceforth, BLH)

It is interesting to note that this same period of development is characterized by a notable lack of two classes of grammatical elements, expletive pronouns--the pleonastic it and existential there²--and verbal auxiliaries, in particular, the modals. The sentences in (2) illustrate the absence of expletives.³

(2) Outside cold	('It's cold outside')
That's cold	(referring to the weather)
No morning	('It's not morning')
Yes, is toys in there	('Yes, there are toys in there') ⁴
No more cookies	('There's no more cookies')

(BLH, 1975)

Some time later sentences like those in (1) and (2) become exceedingly rare. The child is consistent in his use of lexical subjects; subjectless sentences are the marked exception rather than the norm. At the same time, the expletive elements it and there make their first appearance. Shortly thereafter we find the modals and be (copular and auxiliary) in declarative, negative, and interrogative sentences (Bellugi, 1967; Menyuk, 1969).

In this chapter we examine this acquisitional data in detail. We will argue that the clustering of properties noted above, the optionality of lexical subjects, the absence of modals and be, and the absence of lexical expletives--reflect an early grammatical system in which AG = PRO; that is, early English differs from adult English in that the former is a 'pro-drop' language.

The subsequent disappearance of subjectless sentences, alongside the emergence of the expletives, modals and be, represents a shift in the grammar, or more

precisely, a resetting of the AG/PRO parameter such that $AG \neq PRO$. This later grammar is identical to the adult grammar of English with respect to the parameter under discussion, though the two systems may continue to differ in other respects.

In the following section we consider the properties of subjectless sentences in early English, for example, the definite reference associated with the null subject, and the co-occurrence of subjectless sentences and sentences containing full lexical subjects. We compare early English to an adult pro-drop language, Italian.

In Section 3 we formalize the early grammar, which we refer to as G_1 . We argue that various material in the input data, i.e., adult English, is unanalyzable by the early grammar and hence, 'filtered out,' for example, the modals and the "contractible" be (Brown, 1973). Thus, these elements make their appearance only after the shift away from G_1 , that is, after the resetting of the AG/PRO parameter.

In Section 4 we consider the kinds of positive evidence in the input data which could induce a resetting of the parameter. We refer to this as the "restructuring of G_1 ." We show that G_1 is "delearnable" in the sense of Klein (1982).

The properties of early English which we discuss-- subjectless sentences, absence of modals, etc., appear

very early in the acquisition process. The children whose language we examine are (roughly) ages 1-1/2 to 3 years. We therefore adopt the hypothesis that the value AG = PRO is the "initial" value of the AG/PRO parameter, that is, the value assumed in advance of linguistic experience. If this hypothesis is correct, we expect to find these (and related) properties in the language of non-English-speaking children. That is to say, certain aspects of early language should remain invariant across different "target" languages. In Section 5 we briefly discuss word-order in early German; we argue that a particular word-order "mistake" in early German is a result of the AG/PRO parameter. In Chapter Four, we compare the early grammars of English and Italian.

Finally, in the Appendix we will suggest that the obligatoriness of the syntactic relation "subject" (cf. The Extended Projection Principle [Chomsky, 1982]) is a result of certain universal principles operating on the intermediate grammars.

2. Null Subjects in Early Language

The sentences in (1) are from the corpora of one child, Eric, at Times II and III⁵ (Bloom, 1980). Sentences of this sort are pervasive in early English, and have been remarked upon by virtually all researchers of early language. Bloom notes, for example, in her

discussion of Kathryn I (age 1;9) that "the most productive sentence types were those with two major category constituents, and the immediate constituents Verb-Object were the most productive of these" (p. 74). Similarly, she reports that Gia, at Time II (age 1;8) exhibited the same pattern as Kathryn at Time I, i.e., the most frequent two-term utterances were Verb-Object strings.

These sentences persist for several months, although the exact duration varies from child to child. Of the three children studied by Bloom, Kathryn was the quickest to exit this period. Subjectless sentences are consistently found in her corpora from age 21 to 24;2 mos. (Time I through Time III.) For Eric and Gia the period lasted much longer; Eric used subjectless sentences from ages 20;2 to 25;1 (Time II through Time V), and Gia from ages 20;2 to 25;2 (Time II through Time V).⁶

Similarly, Brown, Cazden and Bellugi (1973) report that subjectless sentences appear often in the corpora of "the Harvard children" (Adam, Eve & Sara) through Stage III. In the following passage, they discuss the children's use of imperative sentences.

. . . such sentences (imperatives, NMH) were often produced without explicit subjects as are adult imperatives, but the children very often omitted the subjects of sentences clearly intended to be declaratives. What happens between (stages) I and III⁷ was that subjectless sentences came to be ever more nearly restricted to the imperative, but it was not exclusively imperative even in (stage) III. (p. 306)

One of the most important things to note about these subjectless sentences is that they co-exist with sentences containing overt subjects. The following sentences, from the corpora of Kathryn, Eric and Gia (Bloom, 1970; BLH, 1975) are representative.

Kathryn I

(3) throw away	Mommy throw it away
make a house	'chine make noise
helping Mommy	Lois coming

Kathryn II

read bear book	Kathryn read this
sit on piano	man sit down
want Kathryn a put in a tank	Kathryn want build another house
make a choo-choo train	Lois make a bridge
no want this	no Kathryn want play with self
no have this	Kathryn have a socks on
no like celery, mommy	Kathryn no like celery

Kathryn III

not making muffins	boy jumping in a bathtub
want go get it	I want take this off
go in there	foot goes over there
like a cereal	me like coffee
see Lois n face	I see Kathryn in mirror

Eric III

want more apples
watch noise
No go in

I want doggie
I find it
'nother go in

Eric IV

missing there
turn light off
show Mommy that
need that

it fall down
wrench go there
Mommy sleeping
I got it

Eric V

not crying
open door Mrs. Bloom

no throw it
want look a man
see under there
want some nuts

no car going there
my finger got stuck in
there
you turn that
I want kiss it
I see yellow
want a bagel

Gia III

fix dat
ride truck
happen train

Gia do it
Gia ride bike
Mommy open that

Gia IV

tear it
build a bridge

Lois fix it
Gia write finger

no open wallet
push a button

here ☉ man go in
Mommy change sheets

Gia V

no play matches

no man ride this tank car

bump my train

I make tunnel

bring Jeffrey book

you read this book/I read
this book

play my toys

I want take bridge away

I'm go Jeffrey house/bring
toys

I want go door see Mommy

Similarly, Braine (1973) cites the following 'minimal pairs' obtained in the corpus of Andrew (24-27 mos.).

(4) Put that on
change pants
take a nap
No touch
Want that
plug in

Andrew put that on
Papa change pants
Mama take a nap
This no touch
Andrew want that
Andrew plug in

During this period, one also finds frequent occurrences of what Braine has called 'replacement sequences,' that is, a subjectless sentence immediately followed by an expanded version of the sentence containing the subject. The sentences in (5) are from the corpus of Stevie (25-26 mos.); those in (6) are from Johnathan (26-27 mos.).

(5)

fall ... stick fall

go nursery ... Lucy go nursery

push Stevie ... Betty push Stevie

get ... Lucy get

crawl downstairs ... Tommy crawl downstairs

build house ... Cathy build house

(6)

close radio ... Mommy close radio

take off ... Daddy take off ... Mommy take off

stand up ... cat stand up

(Braine, 1973)

The replacement sequences given above occurred in spontaneous speech. Braine was also able to elicit 'missing subjects' by pretending to misunderstand what the child was referring to when he used the predicate alone. For example, if the child said "in the kitchen," in a context in which it was clear that he intended to convey that this mother was in the kitchen, Braine would respond by saying, "your car's in the kitchen? No, the car's over there, see?" The child would then correct him with "Mommy in kitchen."

The co-occurrence of subjectless sentences with sentences containing overt subjects, the replacement

sequences, and the elicited subjects clearly show that the absence of subjects in children's utterances cannot be attributed to a performance limitation on sentence length. The child is certainly capable of producing a longer version of the subjectless sentence. (Note in this regard that many of the sentences during this period reach four, five, and six words.) Neither is it the case that the absence of a lexical subject correlates with syntactic complexity. Lexical subjects are optional in simple utterances as they are in more complex sentences.

- | | |
|----------------------------------|--------------|
| (7) want Kathryn a put in a tank | (Kathryn II) |
| Kathryn want build another house | (") |
| want look a man | (Eric V) |
| I want kiss it | (") |

Thus, "missing" subjects are not in general due to an increased 'cognitive load' associated with greater syntactic complexity.⁸ Finally, the systematicity of the phenomenon precludes an analysis of these sentences as 'performance errors.'

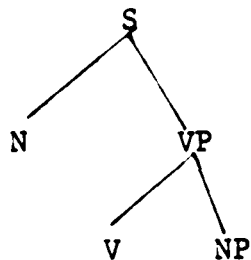
The co-occurrence of the two sentence types has led some researchers, notably Menyuk (1969) and Bloom (1970), to argue that subjectless sentences are a surface phenomenon, and that the constructions do contain a subject at

an underlying level of representation. Thus Menyuk, who refers to these sentences as "predicate constructions," states:

The sentences that are produced during the first three quarters of the third year (2 years, 0 months to 2 years, 9 months) by two children, whose language was sampled once a month, indicate that the Subject-Predicate relation is beginning to be more frequently expressed, rather than the simple Predicate. However, predicate constructions, with subjects not expressed but presumably in underlying structure, still predominate during the early part of this period. (p. 34) (emphasis mine)

Similarly, Bloom (1970) argues that both subjectless sentences and sentences containing overt subjects are to be represented by the phrase-marker in (8).

(8)



Where the subject is not realized at surface structure, N dominates the null element \emptyset . Bloom argues that the inclusion of the lexically unspecified subject position is necessary to account for the semantic interpretation associated with subjectless sentences. She notes that even in the absence of a lexical subject, the sentence

uttered by the child is predicated of a particular person or thing. In short the null subject has definite reference, and the reference can be clearly inferred from context. This is illustrated in the dialogue in (9).

(9) (Eric has just eaten an apple)

Mother: You ate the apple all up.

There's no more apple.

(Eric starts to cry and hits the toys)

Mother: What's the matter?

Eric: Want more apple.

We should note at this point that the referent of the null subject is not restricted to the child himself, that is, it is not simply 'I' which is missing. This is most clearly exemplified by the replacement sequences in (5) and (6) in which the missing subject refers to persons and things other than the child.

One final observation concerning the missing subjects is that they do not belong to a unified semantic class, such as agent of action. Verbs such as want, need, like, assign a semantic role experiencer (Jackendoff, 1972) to their subjects, while the subject of verbs such as fall are typically characterized as theme (Jackendoff, 1972). Thus, an adequate characterization of the null subject phenomenon in early language cannot be stated in terms of

semantic roles without a significant loss of generality. Indeed, facts such as these provide empirical evidence against the semantically-based child grammars discussed in Chapter One. We return to discussion of this issue in Chapter Five.

The acquisition data presented in (3) through (6) reflect two basic properties of pro-drop languages: the lexical subject is optional, and the null subject has definite reference. These are properties which early English shares with Spanish and Italian, for example. The data in (3) reflect a third significant property of pro-drop languages, the absence of full lexical expletives. As pointed out in the introduction to this chapter, the expletive elements it and there are absent during the period of development in which we find subjectless sentences like those in (1).

Recall from our discussion of the Θ -Criterion (Chapter One) that expletive elements may only appear in syntactic positions to which no Θ -role is assigned, for example, the subject position of raising verbs, weather verbs,⁹ and passivized verbs, as in the following examples.

- (10) a. It is raining
 b. It is believed that John is crazy
 c. There was a man on the roof

In contrast to adult English we find that the subject of weather and existential predicates is null in early English, as in (2).

The situation is much the same in Italian (and Spanish). Recall that in these languages, there is no phonological analogue to English expletive it.

- (11) a. Piove oggi
 'Rains today'
 b. Sembra che Gianni sia matto
 'Seems that Gianni is crazy'

Similarly, in Italian existential sentences the subject is phonologically null, though we find a 'locational' ci in SCL position. (See Appendix to Chapter Two for discussion of ci.) Thus, the underlying structure of (12a) is given in (12b).

- (12) a. C'è una ragazza nella stanza
 b. [ex] [[ci]] [è una ragazza nella stanza]
 NP $\overline{\text{INFL}}$ SCL VP
 'There-is a girl in the room'

In general, languages which license a null referential subject, i.e., pro, do not have full lexical expletives

like English it and there. In this regard, early English patterns as expected.¹⁰

The generalization that pro-drop languages do not have lexical expletives is one that is important to later discussion. We therefore diverge briefly to discuss the status of pronouns in pro-drop languages, and the reason that lexical expletives are generally lacking.

2.1 The Avoid Pronoun Principle

In our discussion of the AG/PRO parameter we observed that where AG = PRO, as in Italian, the subject of a tensed clause may be phonologically null. We expect then that this will also hold for sentences in which the subject is expletive; that is, we expect (13a) to be possible where (13b) is possible.

- (13) a. *Sembra che Gianni sia matto*
'Seems that John is crazy'
b. *Mangia una mela*
'Eats an apple'

What remains unclear at this point is why there is no non-pro-drop analogue to (13a), as there is for (13b), given in (14).

(14) Lui (lei) mangia una mela
'He (she) eats an apple'

In order to answer this question we must consider the status of pronouns in pro-drop languages.

It is well-known that in languages like Spanish and Italian pronouns are used only in special circumstances. Consider in this regard the following passage from the traditional grammar of the Real Academia Español.

. . . el sujeto pronominal se emplea correctamente en español por motivos de énfasis expresivo, o para evitar alguna ambigüedad posible, según las circunstancias particulares de cada caso.¹¹

RAE, Esbozo de una gramática de la lengua española, p. 421.

Similarly, for Italian, Fornaciari (1974) reports the following.

[Le forme soggettive dei pronomi personali] si adoperano quindi necessariamente quando il soggetto deve distinguersi da altre persone o contrapporsi loro in qualche modo; quando la persona di un tempo del verbo è uguale ad un'altra, onde potrebbe venire equivoco . . .¹²

R. Fornaciari, Sintassi Italiana, p. 54.

Subject pronouns are thus used for emphasis, contrast, to clear up ambiguities, or to otherwise introduce new information not available from context, for example, to mark a change in discourse topic.¹³ The distribution of subject pronouns is guided by what might be considered 'functional' considerations. From a grammatical point of view, the simplest thing to say about lexical pronouns is that they may be absent wherever a null pronominal is possible. Functional considerations will then determine when the null pronominal is insufficient, i.e., when the situation calls for emphasis, contrast, etc. Within the theory we are assuming, The Avoid Pronoun Principle (Chomsky, 1981) is intended to capture the above facts.

(15) The Avoid Pronoun Principle

Avoid lexical pronominal if a null pronominal is possible.

Recall that there are two null pronominals, PRO and pro. Thus, the principle in (15) requires that a lexical pronoun be avoided where PRO or pro is possible. We may assume that the Avoid Pronoun Principle is part of the speaker's extragrammatical linguistic knowledge,¹⁴ though it clearly interacts with grammatical principles. In particular, it is the grammar which specifies the positions in which PRO or pro is possible.

In Italian and Spanish AG = PRO, and hence, pro may appear as the subject of tensed clauses. We expect then that lexical pronouns will be absent unless necessary for non-grammatical reasons, for example, emphasis. In English, in contrast, AG/PRO, and hence lexical subjects are required in all tensed clauses, irrespective of functional considerations. We can, however, illustrate the functioning of the Avoid Pronoun Principle in English with respect to PRO. Recall that PRO must be ungoverned, and thus may appear as the subject of infinitivals or gerunds. Consider now the following sentences. (Underlining indicates intended coreference.)

- (16) a. ?John would prefer for him to leave early
b. John would prefer to leave early
c. ?John would really hate his doing all the housework
d. John would really hate doing all the housework

The sentences in (16a,c) are marginal for most speakers. As the examples in (16b,d) illustrate, the pronouns him and his (in 16a,c) may be omitted in these contexts, i.e., PRO is possible. The sentences in (16a,c) are therefore in violation of the Avoid Pronoun Principle, and it is this violation which accounts for their marginality. Note that where the pronouns in (16a,c) refer to someone other than John, Bill, for example, the sentences are perfect; that

is, the preferred reading for the sentences in (16a,c) is one in which John and the pronoun do not co-refer. As Chomsky (1981) notes, the Avoid Pronoun Principle generally assigns preferential readings rather than ungrammaticality, thus supporting our initial assumption that it is not a strictly grammatical principle. Thus, the Avoid Pronoun Principle, together with principles of grammar, notably the Binding Conditions, operates to determine the appearance of lexical pronouns.

Returning to our discussion of expletives, the Avoid Pronoun Principle, viewed from this functional perspective can also provide an explanation for the lack of expletive pronouns in pro-drop languages. Expletive pronouns, which are by definition void of semantic content, cannot be used to signal emphasis, contrastive stress, etc. This is exemplified by the following English sentences (where the underlining indicates stress, used for emphasis or contrast in English.)

- (17) a. She is not coming, he is.
b. *It's not snowing, it's raining
(cf. it's no snowing, it's raining)
c. We don't seem crazy, you do
d. *It doesn't seem that we are crazy, it seems
that you are

(cf. It doesn't seem that we are crazy, it seems that you are)

e.*There's a cat on the roof

(cf. There's a cat on the roof)

Various languages, including English, make use of dislocated or topicalized structures to mark a change in discourse topic. Note that expletives may not appear in Topic position.

(18) a. *There, John believe to be a cat on the roof

(cf. A cat, John believed to be on the roof)

b.*It, John hoped was raining

Thus, expletives may not be used for emphasis, contrast, change of discourse topic, etc. From a functional point of view they are useless, and hence may always be avoided. The phonological expletives are nevertheless needed in English to satisfy the grammar, which does not license a null element in their stead. In Italian (and Spanish), in contrast, phonological expletives have no *raison d'être*; they are neither functionally nor grammatically necessary. Given the logic of the Avoid Pronoun Principle, we expect that those languages which license phonologically null subjects will not contain lexical expletives.

The fact that lexical expletives are always "avoided" in a pro-drop language is significant for a particular reason. Note that if the child acquiring English is "aware" of this fact, then the presence of the expletive elements it and there in the input data will be inconsistent with his analysis that English is a pro-drop language. We explore this idea in more detail in Section 4 where we suggest that the English expletives are one of the "triggers" which induce the restructuring of G_1 .

3. The Early Grammar of English (G_1)

All of the evidence we have thus far considered supports the hypothesis that early English is a pro-drop language, or more precisely, that G_1 is a grammar in which $AG = PRO$. The early grammar of English is thus a possible grammar, though it differs from the adult grammar of English with respect to the value chosen for this particular parameter. The optionality of lexical subjects, the definite reference associated with the null subject, and the lack of lexical expletives receive a natural and unified account under the AG/PRO analysis. Where $AG = PRO$, it licenses an empty category in $[NP, S]$. In particular, it licenses the null pronominal pro, thus accounting for the definite reference associated with that position. Finally, the AG/PRO parameter in conjunction with the

Avoid Pronoun Principle, explains the absence of lexical expletives. We need invoke no ad hoc descriptive devices to account for the acquisition data. Each of the properties follows from an independently motivated theory of the pro-drop phenomenon, the AG/PRO parameter. Crucially, the proposed analysis predicts not only the appearance of each of the above properties in the acquisition data, but also their co-occurrence in real time.

At the beginning of this chapter, we pointed out a further property of early English, the lack of modals and be. We noted that the modals are missing from the corpora of Eric, Gia and Kathryn (Bloom, 1970) throughout the period in which lexical subjects are optional, and lexical expletives lacking. Similarly, though the verbs are frequently inflected for the progressive aspect (-ing), the auxiliary be is absent. Some examples follow.

- | | |
|--------------------------|---------|
| (19) a car going there | (E V) |
| Mommy sleeping | (E IV) |
| Gia writing | (G IV) |
| oh oh, baby missing | (G V) |
| man making muffins | (K III) |
| boy jumping in a bathtub | (K III) |
- (BLH, 1975)

In the section that follows we review the relevant acquisition data. As we will see, young English-speaking

children not only fail to produce modals and be in their spontaneous speech, but also appear to "ignore" these elements in experimental tasks.

3.1 The Auxiliaries in Early English

That the modals and be are a relatively late acquisition (that is, late as compared to non-auxiliary verbs) is a well-known fact (Brown & Fraser, 1964; Bellugi, 1967; Brown, 1973), and one which has never been adequately explained.

Brown and Fraser (1964), for example, report the following results of an imitation task administered to young children. Modals were correctly imitated 56% of the time, while the verb be was correctly imitated 33% of the time. This contrasts sharply with the results obtained for (non-modal) verbs which were correctly imitated 85% of the time. Some of the imitated sentences are reported below. The child's age is in parentheses.

(20)

<u>Model Sentence</u>	<u>Eve (25.5)</u>	<u>Adam (28.5)</u>	<u>Helen (30.)</u>
I am drawing a dog.	Drawing dog	I draw dog	I drawing dog
I will read the book	Read book	I will read book	I read the book
I can see a cow	See cow	I want see cow	correct
Do I like to read books?	To read book?	I read books?	I read books?

(Brown & Fraser, 1964.)

Brown and Fraser further observe that this "reduction" of English sentences also occurs in spontaneous speech. The results of their investigation show that children whose Mean Length of Utterance (MLU) is below 3.2 invariably form the progressive construction by omitting the forms of the verb be. Similarly, children whose MLU is below 3.5 omit modals from their sentences. Brown and Fraser claim that

A basic factor causing the child's reduction of the adult sentences is surely an upper limit on some kind of immediate memory span for the situation in which the child is imitating and a similar kind of programming span for the situation in which the child is constructing sentences. (Brown & Fraser, 1964), p. 67)

They note, however, that the span limitation factor does not account for the "systematic tendency to drop one sort of morpheme and retain another sort" (p. 771). The problem remains, then, as to why the modals and be are systematically absent in early English.¹⁵

The child's tendency to "reduce" adult utterances is also noted by Bellugi (1967) in her discussion of adult-child verbal exchanges. Bellugi suggests that the child's "reduced" responses reflect "those portions of the adult sentences which [the child] can analyze successfully." She further suggests that "much of what [the child] hears must be uninterpretable or glossed over as noise" (p. 47). Following we list several of Bellugi's examples.

(21) Mother: I don't think there's one here
Adam: One here
Mother: You've never seen one of those
Adam: Seen one those
Mother: They didn't come
Sarah: Come
Mother: You have to go slow or the dollie won't walk
Sarah: Walk
Mother: Eve, you cannot have it
Eve: (Eve) have it
Mother: No you put it in the stove. You can't have
it again.
Eve: Eve hab again

In the above examples the auxiliaries are systematically absent. As in the elicited imitation task reported by Brown and Fraser, the children appear to "ignore" these elements. Following Bellugi's reasoning, we would conclude that the auxiliaries are "unanalyzed" or "uninterpreted" or "glossed over as noise" by the child.

In the sections that follow we pursue Bellugi's idea. In particular, we will argue that the modals (and be) are neither produced nor interpreted by the child, because the grammar of this period, G_1 , does not provide an analysis of these elements. As we will see, the grammar exerts a "filtering effect" on the input data.¹⁶ We first

consider the absence of modals, reserving discussion of be until Section 3.2.3.

3.2 The Filtering Effect of Child Grammars

It is a basic tenet of generative grammar that the grammar is neutral between speaker and hearer. That is to say that while the grammar is neither a modal for production or comprehension, it underlies both abilities to an equal extent.¹⁷ It is reasonable to expect then, that those elements which are not analyzed by a particular grammar will be neither systematically interpreted nor produced by the speaker/hearer. We should note that we use the term "analyze" in its strictly technical sense meaning "assign a structural description to" (Chomsky, 1965). With this in mind, let us consider the possible analyses available to the child-possessor of G_1 when confronted with a sentence like 'John can eat cake.'

There are in principle two possible analyses for a sentence containing a modal. Either the modal is in AUX, as in English, or it is a main verb, as in Italian. By hypothesis, the child's grammar at this point is a grammar in which AG = PRO. In our discussion of Italian in the previous chapter we argued that where AG = PRO lexical material may not appear in AUX where it would govern AG/PRO. Thus, the option of assigning the modal to the category AUX is excluded in the child grammar. The

AG/PRO hypothesis predicts that the modals will appear in AUX (where they may undergo inversion) only after the grammar has restructured such that AG ≠ PRO, as in the adult grammar of English. Note, however, that the impossibility of generating auxiliaries in AUX prior to restructuring does not explain why there are no modals at all during the period characterized by G₁. The child still has a second option available to him; he could assign the modal the status of a main verb, as in Italian. Let us then consider this option in detail.

In order for the child to analyze the modals as main verbs he must be able to identify them as verbs. In English, one of the crucial properties which distinguish modals from verbs is the lack of morphological marking on the former.

- (22) a.*John is musting go
b.*John musts go
c.*John musted go

Thus, if the child is sensitive to the relationship which exists between particular inflectional forms and particular grammatical classes, it is unlikely that he will misanalyze modals as verbs. There is evidence from both naturalistic and experimental studies that children do, in fact, have knowledge of form-class relationships at a very early age.

In a comprehensive study of the acquisition of grammatical morphemes, Brown (1973) has shown that the inflectional morphemes begin to emerge in production during 'Stage I speech' (see note 7). Some of the morphemes, for example, the progressive -ing, are fully productive at this early stage. Other morphemes, for example, the present and past tense markers, do not become fully productive until Stage IV or V. Thus, during the early stages the child often neglects to use the inflectional morphemes where obligatory as in (23).

(23) man sit down

Although 'errors of omission' are frequent, form-class errors (errors of commission) are strikingly rare, even in very early speech (Miller & Ervin, 1964; Cazden, 1968; Maratsos, 1982). As Maratsos points out, children in general do not "attach verb inflections to members of other potential adult categories, or [to] treat members of the adult category of verb in nounlike ways, and so forth" (p. 252). During Stage II one of the most frequent inflectional forms used by the child is the progressive-ing. Maratsos notes that during this stage children also use terms like away, off, bye-bye out to denote actions in expressions like Gia away and car bye-bye. They do

not, however, produce errors such as *Gia awaying or *car outing. Similar errors involving present or past tense inflection are exceedingly rare.

Thus, although children do not use inflection systematically in the earliest stages, the absence of form-class errors strongly suggests that they recognize which inflections belong to which grammatical classes. There is also experimental evidence that very young children make use of the information provided by inflection in comprehending sentences.

In a cross-linguistic study of children acquiring English, Italian, Turkish, and Serbo-Croatian, Slobin (1982) shows that morphological inflection facilitates sentence comprehension in young children. He claims, in fact, that inflection is the first clue that the child uses in determining the underlying grammatical relations of a sentence. His results indicate that, in fact, the child is sensitive to inflectional clues prior to the point at which he is sensitive to word-order clues.¹⁸

In acquiring the lexicon of his language, the child must learn among other things, the grammatical category to which each word belongs. The lexicon is acquired, in large part, on an item-by-item basis, and it seems reasonable to assume that the child's knowledge of form-class relationships is one of the factors which aid him in determining the grammatical category of particular

lexical items. Nouns are those elements which are inflected for number, while verbs are those items which are inflected for tense and aspect. If morphological markings are criterial in determining grammatical category, as seems natural, the English modals will not be analyzed as verbs.

Earlier we suggested that there are in principle two structural descriptions which the early grammar might assign to a sentence containing a modal, for example, 'John may eat ice-cream.' The modal may be analyzed as appearing under AUX, or as a main verb. We see, however, that both these options are in fact excluded. First, because $AG = PRO$ in G_1 , the modal may not be generated under AUX. On the other hand, the morphological properties of modals (or lack thereof) precludes a main verb analysis. The modals are neither interpreted nor produced during the period characterized by G_1 because they are unanalyzable; they are, in effect, "filtered out" by the grammar. We expect then that the modals will emerge only when they may be generated in AUX, that is, following the restructuring of G_1 . This prediction is borne out by the acquisition data.

As we noted in the introduction to this chapter, in the corpora of Kathryn, Eric and Gia (Bloom, 1970; BLH, 1975), the modals are absent during the period in which subjects are optional and lexical expletives absent,

i.e., during the period in which AG = PRO. Similarly, Menyuk (1969) observes that the modals (and be) appear shortly after the child consistently uses lexical subjects. Menyuk charts the major developments in the generation of various sentence types as follows.

(24)

- (1) The conjoining of elements to sentences (e.g., the negative element appears in sentence initial position as in "no write this").
 - (2) Development of Subject-Predicate sentences (i.e., consistent use of lexical subjects).
 - (3) Expansion of the VP node to include AUX/Modal or copula.
 - (4) Embedding an element within a sentence and attachment of the element to the Verb (e.g., "I don't know that one").
 - (5) Permutation of elements within the string (AUX/Modal and tense markers), (e.g., "Do you remember me?":)
- (P. Menyuk, 1969, p. 75)

Note that the development of the "subject-predicate" sentences is just prior to the appearance of auxiliaries. In terms of ages, Menyuk notes that during the later part of the period which ranges from ages 2.0 to 2.9 "the subject predicate relationship is beginning to be more

frequently expressed, rather than simply predicate," while the "predicate constructions . . . still predominate during the early part of this period" (p. 34). For the children she studied, the modals and be appeared between the ages of 2.10 and 3.0. Some examples follow. (From Menyuk, 1969).

(25) Declaratives

The snow is soft to me
My baby is eating
She can sit on my lap
I did read that motor boat book
I'll hold it till you go home

Negatives

It's not Amy's
I'm not going to fall off this horsie
Everybody can't have a turn
I don't know that one
You won't kick it down

Questions

Isn't that funny?
Are there frogs swimming in there?
Can I see how he drives nicely?
Do you remember me?
Will you go off again?

Bellugi (1967), in her study of the acquisition of negation, observes a developmental sequence strikingly similar to that noted by Menyuk. Bellugi traces the development of negation through three phases, which she labels Periods A, B and C. Bellugi's study is of interest here because the development of negation interacts directly with the development of modals (and be). During Periods A and B the modals (and be) are absent. In Period A, the negative markers no and not appear in sentence initial position, while during Period B the negation is located between the subject NP and the VP. Subjectless sentences are frequent during these two periods (though less so in Period B). The following data, from Bellugi (1967), and Klima and Bellugi (1973), are representative of each period.

(26) Period A

Doggie fix it
Oh no raining
Not the sun shining
No want stand head
Adam fall toy
Give doggie paper
Not have coffee
No Fraser drink all tea
No Mommy giving baby Sarah milk

What doing?

What cowboy doing?

Period B

Put on floor

See my doggie?

No, that not a circus train

That no blast off

He not bite you

I not get it dirty

I not bending them

Have that?

No, play sunshine

Period C marks the emergence of the modals (and be) in declarative, negative and interrogative sentences. As in the adult system, the negation now appears either contracted to, or immediately following, the modal or auxiliary.

(28) Period C

He won't come

I can't see it

The sun is not too bright

I will write right here

Could I use this one?

Did you make a great big hole in there?

Will you help me?

By Period C, we no longer find subjectless sentences in the data reported by Bellugi. These data suggest that the restructuring of G_0 occurs at some point between Bellugi's periods B and C.

The facts noted by Bellugi and Menyuk support the prediction made by the AG/PRO hypothesis. The modals (and be) appear only after the grammar has restructured such that AG is no longer identified with PRO. At this point the modals and auxiliaries may be freely inserted into AUX (as in the adult grammar of English). As expected, they undergo inversion and negative contraction. At the same time, because $AG \neq PRO$, null subjects are no longer licensed, and hence, the child is consistent in his use of lexical subjects.

3.2.1. The Semi-Auxiliaries

On the above analysis the late appearance of modals is explained by strictly grammatical factors--the impossibility of modals in AUX and the morphological differences between verbs and modals. A priori, there is at least one other account of the modal facts, namely, that the modals are semantically or conceptually more complex than verbs. Although relative semantic or conceptual complexity is not easy to characterize, it seems intuitively plausible that

modalities such as obligation (must), ability (can), futurity (will), are more difficult for the child than verbs, which signal actions (sit), perceptions (see), desires (want), etc.¹⁹ To understand the modals the child must be able to conceptualize possible (or future), but presently non-existing, situations. However, while an account along semantic-conceptual lines might provide insight into the late appearance of modals relative to verbs like the above, it cannot explain their late appearance relative to the semi-auxiliaries have to (hafta), going to (gonna), which have roughly the same meanings as the modals must and will.

Bellugi (1967) reports that the semi-auxiliaries have to and going to appear frequently during Period B. Recall that the modals do not emerge until Period C--a full three to eight months later. The prior emergence of the semi-auxiliaries is also attested in the corpora of Kathryn, Eric, and Gia (BLH, 1975), and for the children studied by Menyuk (1969). Thus, sentences like those in (29) are frequent at a point at which the (semantically equivalent) modals are non-existent.

- (29) a. I gon' cut some more
b. I going...give it to somebody
c. I hafta eat my ice cream

(Bellugi, 1967; BLH, 1975)

In adult English the semi-auxiliaries, though semantically equivalent to the modals, exhibit the morphological (and syntactic)²⁰ properties of verbs. The semi-auxiliary have to, for example, is inflected for present and past tense.

- (30) a. John has to leave early
b. We have to finish typing tonight
c. Mary had to write her paper for the conference

While it is difficult to imagine a plausible semantic account of the acquisition of modals which would explain the prior appearance of the semi-auxiliaries, there is a rather straightforward grammatical account. On our analysis the delayed appearance of the modals is due to the fact that the early grammar cannot analyze them as either members of AUX or as main verbs. The semi-auxiliaries, in contrast, have clear verbal morphology. The inflection on have to is illustrated in (30). Similarly, the semi-auxiliary going to is marked by the progressive aspect morpheme -ing, which, as we discussed earlier, is one of the first grammatical morphemes over which children have production control (Brown, 1973). We thus expect that the semi-auxiliaries will present no particular problem for the child. In particular, they emerge prior to the shift away from G_1 because they may be analyzed as main verbs.

To sum up, then, we have argued that the early grammar of English is distinct from the adult grammar of the language with respect to at least one parameter--the AG/PRO parameter. In particular, in the early grammar AG is pronominal, i.e., is identified with PRO. The choice of this particular value is responsible for many of the properties of early language, the optionality of lexical subjects, the lack of lexical expletives, and finally, the absence of modals. With regard to this last property we proposed that the early grammar exerts a "filtering effect" on the data. The child systematically "ignores" a class of elements²¹ for which his grammar provides no structural description.

The hypothesis that the early grammar filters out unanalyzable material implies that it will analyze as much of the string as it can. To the extent that the early grammar is distinct from the adult grammar, however, various material may be analyzed differently by the two systems. The child's "misanalysis" represents the only possible analysis of the data given the shape of his grammar, and thus offers unique insight into the properties of the early grammar. In the sections that follow we will discuss a class of elements which is in fact "misanalyzed" during the early period of development, the negated modals can't and don't. The restricted distribution of these elements strongly suggests that they do not have the same status in early English and adult English.

3.2.2 Can't and don't

Bellugi (1967) was the first to note that the elements can't and don't emerge prior to all other modals. Specifically, we find occurrences of these elements during her Period B, that is, three to eight months before the first appearance of will, could, etc., and of the non-negated can and do (Period C). Bloom (1970) and Johnson (1982) observe precisely the same pattern in their studies. Recall that during Period B sentence negation is also marked by the simple negative markers no and not in pre-verbal position. Thus alongside the negative sentences in (27) we have the following. (Sentences from Bellugi, 1967; Bloom, 1970; BLH, 1975.)

- (31) I can't wear it
He don't want some money
Can't reach it
Don't break it

During this period, the modals do not occur in declarative or interrogative sentences. Thus, we do not find I can do it, Can I have it?, Do you want this?, etc. On the basis of these facts, Bellugi argues that can't and don't do not represent members of the category AUX at this stage. Rather, they are simply lexical variants of the negative marker, which she labels NEG. The

category NEG includes four elements, no, not, can't, don't, each of which may be inserted into pre-verbal position.

Although Bellugi's account is an adequate description of the facts,²² she offers no explanation for the phenomenon. First, why is it the case that can't and don't appear significantly earlier than the rest of the modals, including their non-negated counterparts do and can? Second, why are they analyzed as negative markers rather than modals? Within the framework we have been developing both of these questions receive straightforward answers.

Earlier we claimed that G_1 restructures between Periods B and C, therefore, the grammar of Bellugi's Period B is G_1 , that is, a grammar in which $AG = PRO$. By hypothesis, the modals are unanalyzable during this period, and hence filtered out. Thus, can't and don't cannot be analyzed as appearing in AUX. Unlike their non-negative counterparts, however, they can be analyzed as negative markers, as Bellugi suggests. Recall that during this period, the child places the negative marker in pre-verbal position. (See the sentences in (27.) Bellugi proposes that the grammar contain the following base rule.

(32) $S \rightarrow NP \quad (NEG) VP$

We are assuming that the expansion of S also contains an INFL node, and thus we modify Bellugi's rule slightly, as follows.

(33) S → NP INFL (NEG) VP²³

In adult declarative sentences don't and can't have the same distribution as the child's no and not, i.e., they occur in pre-verbal position. Furthermore, don't and can't are uttered with negative intent (which may be inferred by the child from the non-linguistic context). Given this distributional and pragmatic evidence, it is easy to see how the child would extend the class of negative markers to include can't and don't. A similar analysis is unavailable for can, do, etc., however.

In the previous section we suggested that the early grammar will analyze all the material it can, even if the resulting analysis is "incorrect" for the adult grammar. The child's analysis of can't and don't is an instance of precisely this situation. These two elements emerge significantly earlier than the modals because there is an alternative analysis of them which is not "inconsistent" with G₁. The situation is analogous to that of the semi-auxiliaries. Because of their verbal inflection, the semi-auxiliaries have to and going to are analyzed as verbs, and therefore emerge prior to the modals. Similarly,

because can't and don't may be analyzed as negative markers, they too may appear although AG/PRO delays the emergence of the modals.

In the discussion of the auxiliary systems of Italian and English presented in Chapter Two, we argued that where the modals (and auxiliary elements) appear under AUX they may be freely inverted by 'Move INFL.' This was the case in both English and Italian. Similarly, Bellugi observes that when the modals emerge (Period C), they occur in declaratives, negatives, and interrogatives, i.e., in inverted structures. The examples, given in (28) are repeated below for ease of exposition.

(34) Could I use this one?

Did you make a great big hole here?

Will you help me?

During this period, negated modals are also inverted in interrogatives, as follows.

(35) Can't it be a bigger truck?

Can't you work this thing?

As expected, the modals in the child's system behave exactly as they do in the adult grammars of English and Italian. At the point at which they may appear in AUX,

they may undergo inversion. Thus, the acquisition data given in (34) and (35) provide additional support for the analysis of the auxiliary system presented in Chapter Two. Moreover, they constitute further evidence that child grammars are not fundamentally different from adult grammars.

Following Bellugi, we have argued that the elements can't and don't which appear during Period B are not generated under AUX. Rather, they are negative markers which appear immediately preceding the verb, as in (33). If this hypothesis is correct, can't and don't should not be subject to 'Move INFL' at this point in time. This is in fact the case. In the following examples, from Period B (Klima & Bellugi, 1973), can't remains in its base position, though the sentences have the rising intonation typically associated with children's questions.

- (36) This can't write a flower?
You can't fix it?
Why not...me can't dance?

Thus can't and don't, like the semi-auxiliaries, are not 'filtered out' of the input data; that is to say, there is an analysis of these elements which does not entail assigning them to the category AUX, a possibility which is excluded by AG/PRO.

On our analysis the grammars of Bellugi's (1967) Periods A and B differ minimally. We may assume, following Bellugi, that they differ with respect to the placement of the negative marker. During Period A, negation appears in sentence initial position, while during Period B, it appears pre-verbally. The two grammars also differ in that the lexicon of Period B contains two additional items, can't and don't, which are members of the category NEG. They do not differ, however, with respect to the parameter under discussion. In both cases, AG = PRO. For clarity of exposition, we continue to refer to the grammars in which AG = PRO as G_1 , abstracting away from changes in the system which are not directly related to the AG/PRO parameter. In the section that follows we discuss the emergence of the verb be (auxiliary and copular).

3.3 G_1 and the Syntax of be

Earlier we noted that the verb be, like the modals, is absent from early English, i.e., during the period characterized by G_1 .²⁴ It is important to note first that the 'missing be' phenomenon is not as general as the 'missing modal' phenomenon. In particular, Brown (1973) observes that young children fail to "delete" be in those contexts in which it would be impossible to contract be

in the adult language. In adult English be cannot be contracted in sentences of the following sort.

- (37) *Here it's (cf. Here it is)
 *There it's (cf. There it is)
 *What's it? (cf. What is it?)

Brown found that children consistently produce be (in its uncontracted form) in sentences like those in (37), for example, 'What is it?' He notes that "certain uses of be . . . were perfect or nearly so from quite an early point" (p. 265). Following Brown, we refer to this be morpheme as the "uncontractible copula." This name is intended to reflect the fact that this be may not be contracted in the adult language.

At the same time that the children are correctly producing the uncontractible copula with 'here,' 'there,' and wh-words, they systematically fail to produce be in progressive and predicative constructions as is illustrated in the following examples.

- (38) You so big
 Adam home
 Oh, no raining
 No the sun shining
 He eating ice cream

You waking me up
(Bellugi, 1967)

As Brown observes, the children omit be in precisely those contexts in which contraction is possible in the adult system.²⁵ In the adult language the copular and auxiliary be may be contracted in the sentences in (38), as follows.

- (39)a. You're so big
- b. Adam's home
- c. Oh, no it's raining
- d. No, the sun isn't shining
- e. He's eating ice cream
- f. You're waking me up

Brown refers to the be in (39a,b) as the "contractible copula," and that in (39c-f) as the "contractible auxiliary." To sum up the results of Brown's study, the uncontractible copula emerges significantly earlier than both the contractible copula and the contractible auxiliary. The contractible forms are in fact the last of the 14 grammatical morphemes to be acquired, while the uncontractible copula ranks 6.50 in order of emergence (Brown, 1973). Strictly speaking then, it is the contractible be (copula and auxiliary) which patterns like the modals, while the uncontractible copula is productive

prior to the restructuring of G_1 . Let us now see why this should be the case.

Recall that the child's difficulty in analyzing the modals is a function of the fact that (a) it may not appear in AUX, and (b) it lacks the verbal morphology which would identify it as a main verb. The verb be, in contrast, may be identified as a verb given its inflectional properties. The prediction then is that be should emerge prior to the modals, that is, it need not await the restructuring of G_1 . Thus, the uncontractible copula behaves as expected. We may assume that when confronted with input data like 'there it is,' 'where is it,' etc., the early grammar assigns to the string a structural description in which be is a main verb.²⁶ The alternative analysis, in which be is in AUX, is excluded by the fact that $AG = PRO$.

There are, however, other data which will counter-exemplify the hypothesis that be appears in VP. In particular, the child will hear sentences containing the contractible be (copula and auxiliary), for example, 'He's going,' 'I'm happy,' and so on. Where be may be contracted it must appear in a position adjacent to the element onto which it contracts, i.e., it is in AUX, and not VP (Emonds, 1976).²⁷ The adjacency requirement on contraction forces an analysis in which be is in AUX, but this analysis is impossible for G_1 . Thus, the contractible

auxiliary and copula, like the modals, are filtered out of the input data. From the child's perspective there is a main verb be which is generated in expressions introduced by here, there, where, etc. The verb be is never contracted in these early utterances because it does not appear in AUX; hence, Brown's observation that the child is correct in his use of the uncontractible copula at a very early age. The early grammar can not, however analyze the be which appears in the progressive and simple predicative constructions, i.e., the contractible be. Thus, while in the adult grammar of English, the progressive is formed with be + ing, in the early grammar the progressive marker is simply -ing. Similarly, though predicative constructions require the copular be in adult English, in early English they are "verbless."²⁸

The contractible be (copula and auxiliary) emerges following the restructuring of G_1 , when it may appear in AUX. At that point we find be in progressive and predicative constructions, and, as with the modals, it appears in declarative, negative and interrogative sentences. The following sentences are from Bellugi's (1967) Period C.

- (40) That is a funny one
It's going to frighten you
I'm in your car
Is that my pencil?

Are you having coffee?

I'm not a turtle

This isn't clay

Why it's not working?

As noted in Chapter Two, in the adult grammar be is generated VP and raised into AUX where it may undergo contraction and inversion. In the early grammar be may only occur in VP. Thus, in those cases in which information in the input data, i.e., contraction, precludes a main verb analysis, be is neither produced nor (by hypothesis) interpreted. It is filtered out of the input data like the modals. The option of raising be into AUX, where it may be contracted and inverted, as in (40), is available only after the grammar restructures such that AG ≠ PRO. The delayed emergence of the contractible copula and auxiliary relative to the contractible copula is predicted by the AG/PRO hypothesis.²⁹

In the following section we discuss the restructuring of G₁. Let us anticipate that discussion by presenting a specification of the point at which the restructuring takes place for each of the children thus far discussed.

As we noted earlier the shift away from G₁ (the AG/PRO grammar) occurs following Bellugi's Period B, and thus by Period C we find the regular use of lexical

subjects, modals and the contractible be. We have chosen to describe the point of shift in terms of Bellugi's periods since it is difficult to specify the age at which the grammar restructures. As is well-known, age is not a reliable predictor of grammatical development in children. In the table that follows we list the ages corresponding to the three periods for each of the children in Bellugi's study. (Age in months is the mean for each period.)

(41) (From Bellugi, 1967)

	Adam	Sarah	Eve
Period A	28 mo.	29 mo.	19 mo.
Period B	35 mo.	36 mo.	23 mo.
Period C	38 mo.	44 mo.	26 mo.

Following are the Times (taping sessions) and ages during which the language of Kathryn, Eric and Gia (Bloom, 1970) is characterizable by G_1 .

(42) Eric - Time I thru Time V (20;2 - 25;1)
 Gia - Time II thru Time V (20;2 - 25;2)
 Kathryn - Time I - thru Time III (21 - 24;2)

Thus, for these children the shift occurs at the following points.

- (43) Eric - Time VI (26;3)
 Gia - Time VI (27;1)
 Kathryn - Time IV (26;4)³⁰

As we can see from the above tables, Eve, Eric, Kathryn and Gia are roughly the same age at the point at which G_1 restructures. Adam and Sarah are significantly older. Thus, the duration of G_1 may vary from child to child as may the age at which restructuring takes place. What remains invariant is the qualitative change in the utterances the children produce beyond a given point. We first find a regular and productive use of lexical subjects, closely followed by the emergence of the class of modals and the progressive and copular (contractible) be. Prior to the restructuring, we find only the semi-auxiliaries, the negative markers can't and don't, and the uncontractible be, i.e., those elements which are analyzable by G_1 . In the section that follows we discuss the restructuring of G_1 .

4. The Restructuring of G_1

The theory of G_1 presented in this chapter (and independently motivated by the facts of adult languages)

has a fairly broad empirical base. It accounts for several previously unrelated properties of child language. It furthermore provides empirical support for the claim that grammatical development is, in large part, a matter of fixing the parameters of UG at one or another of their predetermined values. To the extent that this is true, we have an explanation for the rapid and uniform development of an adult grammatical system.

While UG determines the range of possible values for each of the parameters (and in certain instances, an initial value), it obviously does not specify which of these values is correct for any particular language. As we have seen, the initial value of the AG/PRO parameter is not in fact correct for English. It must be the case, then, that there is linguistic evidence (primary linguistic data) which will allow the child acquiring English to reset this parameter. In other words, G_1 must be "delearnable" in the sense of Klein (1982). In this section we will consider the kinds of data which could induce a resetting of the AG/PRO parameter. Before turning to this, however, we wish to lay bare certain assumptions we are making concerning the nature of the primary linguistic data (henceforth PDL) which is available to the child.

Following Baker (1979), we assume that the child has access to 'positive' data, i.e., a subset of the

well-formed sentences of his language. These sentences may be directed at the child, or simply uttered in his presence. He does not have access to 'negative' data, that is, he has no direct knowledge of the ungrammatical sentences in the language. The child, of course, may hear ungrammatical strings, but they are not labeled for him as such and, hence, are of dubious linguistic value.³¹

Similarly, negative evidence in the form of parental disapproval or overt corrections has no discernible effect on the child's developing syntactic ability (McNeil, 1966; Brown & Hanlon, 1970; Braine, 1971; Brown, Cazden & Bellugi, 1973). We must therefore assume that the data which induce a restructuring of G_1 , i.e., a resetting of the AG/PRO parameter, are well-formed sentences of English which cannot be generated by a grammar in which AG = PRO. In the section that follows we consider two kinds of PLD which could "trigger" a resetting of the AG/PRO parameter in the grammar of the young child acquiring English--lexical expletives, and infelicitous referential pronouns. We begin with the expletives.

4.1 The Triggering Data

In Section 2 we observed that pro-drop languages like Italian and Spanish do not have lexical expletives. The lack of expletives followed from the interaction of a particular grammatical principle (the AG/PRO parameter)

and a specific pragmatic principle: the Avoid Pronoun Principle. The grammars of Italian and Spanish (and other languages) license an empty category (pro) in the subject position of tensed sentences. By the Avoid Pronoun Principle, lexical pronouns are avoided where they are not needed for pragmatic reasons, e.g., contrast, emphasis, change of discourse topic, etc. Thus, expletive pronouns, which may not be used for the above reasons, are always avoided in these languages. Given that lexical expletives appear only in non-pro-drop languages,³² these elements may serve to trigger a restructuring of G_1 . In English the crucial data are sentences containing expletive it and there.

We assume that the child, like the adult, operates under the Avoid Pronoun Principle. (We return to this in Section 4.2.) That is to say, the child knows that a lexical pronoun is avoided where a null pronominal is possible. Thus, when the child acquiring English becomes aware of the lexical expletives, he knows that because these elements are void of semantic content they do not signal emphasis, contrast, change of discourse topic, etc. In other words, they are not present for pragmatic reasons. The alternative is that they have a strictly grammatical function. At this point, the child may deduce that the expletives are necessary because a null pronominal is impossible in [NP,S], and hence, that AG cannot be PRO.

If this hypothesis is correct, we expect that at the point at which the child begins using expletive it and there (and hence, we know that he is aware of these elements) he will no longer produce subjectless sentences.³³ This is in fact the case. In the table in (43) we indicated the point at which Kathryn, Eric and Gia no longer produced subjectless sentences. We argued that this is the point at which the grammar restructures for these three children. For Gia, this occurs at Time VI. The following sentences, which are the first occurrences of expletives in her corpora, occur at Time VI.

(44) Gia VI

No, it's not raining
 It's not cold outside
 There's no more
 There's no money
 (BLH, 1975)

As we pointed out at the beginning of this chapter the expletives are systematically absent prior to the shift.³⁴ This is illustrated by the examples in (2) (repeated below).

(45)	Outside cold	(K II)	('It's cold outside')
	That's cold	(K I)	(referring to the weather)
	No morning	(G III)	('It's not morning')

Is toys in there (G V) ('There are toys in there')
No more cookies (G V) ('There are no more
cookies')

We thus find that the lexical expletives emerge at the point at which the child begins consistently using lexical subjects. If the lexical expletives do trigger a resetting of the AG/PRO parameter, this is the result we expect.

Given the logic of a parameterized theory of grammar, we expect restructuring to be triggered by relatively simple data which are readily available to the child. For this reason the hypothesis that the lexical expletives trigger a restructuring is attractive. Ideally, we would like a theory in which the class of "triggering data" is restricted in a principled fashion. A very strong claim (too strong, perhaps) is that all restructuring is induced by the acquisition of particular lexical items (and their associate properties). For example, it may be the case that embedding is introduced into the grammar by the acquisition of verbs which subcategorize a sentential complement. Limber (1973) notes in fact that "complements with a given complement-taking verbs will appear within a month after the first use of that verb in any construction . . ." (p. 175). He notes that the first complex sentences contain verbs such as want and watch which the child previously used with NP objects. Other sentential complements, (e.g., relative clauses) emerge later. Thus,

the acquisition of particular verbs may induce a restructuring in the grammar to include sentential embedding under VP, which then allows for relative clauses.

Within such a theory, the triggering function of the expletives is entirely natural. The learning of these elements (and hence, their associated properties, i.e., null semantic content) will have complex consequences throughout the grammar. There is, however, a problem with the 'expletive trigger' hypothesis, and one for which we have no ready solution. We have suggested that the initial lack of expletives in child language is a function of AG/PRO (which licenses a null subject) and the Avoid Pronoun Principle (which requires that unnecessary pronouns be avoided). The question thus arises as to how data which are "ignored" for principled reasons suddenly become salient, or, in other words, how can data which are in some sense "filtered out" also act as triggering data. This particular paradox is an instance of the much more general phenomenon of "selective attention" (Newport, Gleitman and Gleitman, 1977). It is well-known that children do not analyze all of the available data (if they did acquisition would indeed be "instantaneous"). Rather, they select certain data for analysis and ignore others. These other data may then be analyzed at a later point. The basis for the child's selection is not well understood, however. In light of the general problem of "selective attention", and the particular problem raised by the

'expletive trigger' hypothesis, it is important to note that the restructuring of G_1 does not rely crucially on these data. There are in fact other triggering data which do not create a similar problem, namely, sentences in which a referential subject pronoun (he, she, they, etc.) appears in pragmatically unnecessary or infelicitous circumstances.

By our hypothesis, the child is operating under the Avoid Pronoun Principle, and hence, expects that subject pronouns will be avoided except where required for contrast, emphasis, etc. In English contrastive or emphatic elements are generally stressed. Once the child learns this, any subject pronoun which is unstressed might be construed as infelicitous.³⁶ As with the expletives, the child could then deduce that if the referential pronoun is not needed for pragmatic reasons, it must be necessary for grammatical reasons, i.e., a null pronominal is impossible, and hence, $AG \neq PRO$. At this point we expect that the child will begin using lexical subjects consistently, in particular, he will produce expletive subjects (it and there) since a null subject is no longer licensed anywhere. On this account as well, the co-occurrence of consistent lexical subjects and the emergence of the lexical expletives is predicted, although the latter do not constitute the triggering data.

There are thus two potential triggers. In principle, either the lexical expletives or the infelicitous pronouns could induce a restructuring of G_1 .³⁷ There are various ways of testing the hypothesis that these elements act as triggers. For example, we suggested that once the English-speaking child learns the contrastive or emphatic effect of stress, he might construe any unstressed subject pronoun as infelicitous. From this he could deduce that AG is not identified with PRO in English. Thus, we might independently determine the point at which the child uses phonological stress as an emphatic or contrastive device. If this occurs significantly earlier or later than the point at which we find the effects of restructuring, it would argue against the 'infelicitous pronoun' hypothesis.

Acquisition data from other languages might also help evaluate the two proposals, in particular, data from German. We single out German because it is a non-pro-drop language which nevertheless allows a null expletive in certain restricted contexts. In German, the null expletive appears in certain tensed subordinate clauses, while the lexical expletive es (it) appears in tensed matrix clauses.

- (46) a. Es ist klar, dass.....
'It is clear that....'
b. *Er glaubte, dass es klar ist, dass...
'He believed that it clear is, that...'

c. Er glaubte, dass klar ist, dass....

'He believed that clear is that...'

German-speaking children, like English-speaking children, produce subjectless sentences during the early periods of acquisition, that is, in the early grammar of German AG = PRO. (We discuss early German in Section 5.) Moreover, as we will see in Section 5, they appear to be particularly sensitive to the SOV word order in subordinate clause (Roeper, 1973). If lexical expletives do trigger the resetting of the AG/PRO parameter, we might expect that the acquisition data of German-speaking children would differ in some way from that of English-speaking children, as a reflection of the fact that the triggering data are somewhat more ambiguous in German.

Let us conclude this section by noting that the two hypotheses which we have proposed concerning the triggering data for the AG/PRO parameter make different empirical predictions, both in English and German.³⁹ Because the relevant data are unavailable to us, we must leave the issue unresolved. However, the crucial point is that there are sufficient data in English to trigger a resetting of the parameter, and hence, G_1 is "delearnable."

4.2 The Avoid Pronoun Principle In Child Language

Throughout our discussion of the triggering data, we have been assuming that the young child operates under

the Avoid Pronoun Principle. Let us now discuss this assumption.

Recall that the Avoid Pronoun Principle is operative in pro-drop and non-pro-drop languages alike. The effects of this principle are more widespread in a language like Italian simply because the grammar of Italian licenses two pronominal empty categories--pro and PRO, while the grammar of English, for example, licenses only PRO. The Avoid Pronoun Principle thus operates within the constraints imposed by particular grammars. This means that while it is the grammar which determines whether the subject position of tensed clauses may contain a null pronominal, the appearance of the empty category in any particular token utterance is a result of the pragmatic conditions under which it is uttered. The pro-drop phenomenon illustrates the manner in which grammatical and pragmatic factors interact to determine the shape of particular sentences.

As a universal pragmatic principle, the Avoid Pronoun Principle also shows its effects in child language. It appears however that the pragmatic conditions which satisfy this principle are less restrictive for children than for adults. In the child language literature, it is often suggested that children omit sentence subjects because this information is in some sense "recoverable" from context. This is essentially the position adopted by

Greenfield and Smith (1976). Greenfield and Smith argue that during the 'one-word' stage the child "encodes that aspect of the event where he sees alternatives, where there is uncertainty in terms of situational structure" (p. 64). They further suggest that this Principle of Informativeness carries over to later periods of development when the child omits from the sentence that aspect of the situation which is "taken for granted," "presupposed," "less informative," etc. According to Greenfield and Smith, "this explains the frequent deletion of the subject in speech around the three-word level" (p. 223).

It is well-known that early language centers largely on objects and events in the immediate environment. Gia, for example, utters 'Gia ride bike' as she gets on her bicycle, or 'Mommy change sheets' as she watches her mother taking the sheets off the bed. Similarly, Kathryn says 'man making muffins' as she looks at a picture of a man baking bread (Bloom, Lighbown, & Hood, 1965). Sentences like these, which are characteristic of early language, are not particularly 'informative'; that is to say, each element in the sentence is equally uninformative or recoverable from context. In the situation in which Gia utters 'Gia ride bike,' it is only Gia who is getting on the bike; she is clearly going to ride the bike, as opposed to, say, break it, clean it, etc. Finally, she is getting on a bike, not a chair, bed, etc. By the

Principle of Informativeness any one of the elements in a sentence of this sort is expendable. Yet we find that in the overwhelming majority of cases, it is only the subject which is 'omitted.' Thus, the Principle of Informativeness alone will not explain subjectless sentences.³⁹ We may, however, incorporate the central insight of the Greenfield and Smith proposal into a somewhat different account of the facts.

In an adult pro-drop language, a pronoun may be avoided where it is not needed for contrast, emphasis, change of discourse topic, etc. If Greenfield and Smith are correct, in child language a pronoun may also be avoided if its referent is available in the immediate environment. However, because the Avoid Pronoun Principle operates within the constraints imposed by particular grammars, the pronoun may only be avoided where the grammar licenses a null pronominal. In the early grammar AG = PRO, and hence, lexical subjects may be avoided. There is, however, no provision in the early grammar for null objects. Hence, while subjectless sentences are frequent, we do not expect to find regular production of 'objectless' sentences.⁴⁰ A strictly pragmatic account, like that proposed by Greenfield and Smith, does not capture this subject-object asymmetry. Thus, child language, like adult language, shows the interaction of grammatical and pragmatic principles, in this instance, the AG/PRO parameter and the Avoid Pronoun Principle.

5. Word Order in Early German

In this chapter, we have examined in some detail the effects of the AG/PRO parameter on the early grammar of English. Because these effects appear early in the acquisition process, we suggested that the value AG = PRO represents the initial setting for this parameter; that is, it is the value specified in advance of experience with a particular language. Given that children do not come "prewired" to acquire one language rather than another (i.e., the initial settings are invariant across children), we expect that the language of non-English-speaking children will exhibit the essential properties we have been discussing, for example, subjectless sentences. Just as theories of UG may be empirically verified (or falsified) by investigating the grammars of different languages, so theories concerning the initial parameter settings may be tested against the developing grammars of other languages. With this in mind, let us briefly consider certain aspects of early German.

Roeper (1973) notes that 2-year old German-speaking children consistently place the direct object before the verb in 2-word utterance (80 percent of the subjectless sentences are OV), and do so to a significant degree in 3-word utterances (> 50 percent are SOV).⁴¹ The OV word order would not be particularly startling were it not for

the fact that in adult German, matrix declarative sentences are SVO (as in English).

- (47) Hans liebt Maria
'Hans loves Maria'

At first glance, these data suggest that German-speaking children systematically violate the word-order constraints of their language, contrary to Brown's (1973) finding that word order is one of the earliest aspects of syntax that the child controls. As Roeper notes, however, even a cursory examination of German reveals that there is in fact a "model" for the particular word-order adopted by young children. The order of constituents in German subordinate clauses is SOV.

- (48) a. Hans, der Wurst isst, liebt Maria
'Hans, who Wurst eats, loves Maria'
b. Hans sagte dass Maria das Buch gelesen hat
'Hans said that Maria the book read has'
(=Hans said that Maria has read the book)

Thus the acquisition data from German do not actually constitute a counterexample to Brown's claim. The children have fixed their \bar{X} Parameter (see Chapter One) based on the order of elements in the subordinate clause, i.e., 'head-last.'

It has been argued extensively that the underlying word order in German is SOV (Emonds, 1970; Bresnan, 1970; Thiersch, 1978). We thus assume that the base rules for German are as follows (Thiersch, 1978; Safir & Pesetsky, 1981).

- (49) a. $\bar{S} \rightarrow \text{COMP S}$
 b. $S \rightarrow \text{NP VP INFL}$
 c. $\text{VP} \rightarrow \text{NP V}$

To the above list we add the expansion of INFL given in Chapter Two.

- (50) $\text{INFL} \rightarrow \text{AG AUX}$

To account for the order of constituents in the matrix clause, Safir and Pesetsky, following Thiersch (1978) and others propose that the tensed verb moves into INFL (i.e., AUX). The transformational rule 'Move INFL' (an instantiation of 'Move α ') adjoins INFL to S. We thus have the following operations.

- (51) a. $\left[\begin{array}{c} \bar{S} \\ \text{COMP S} \end{array} \right] \left[\begin{array}{c} \text{Hans} \\ \text{VP} \end{array} \right] \left[\begin{array}{c} \text{das Buch gelesen hat} \\ \text{INFL} \end{array} \right] \left[\begin{array}{c} \text{AG} \\ \text{AUX} \end{array} \right]$
 'Hans the book read has'
 b. $\left[\begin{array}{c} \bar{S} \\ \text{COMP S} \end{array} \right] \left[\begin{array}{c} \text{Hans} \\ \text{VP} \end{array} \right] \left[\begin{array}{c} \text{das Buch gelesen } e_i \\ \text{INFL AUX } i \end{array} \right] \left[\begin{array}{c} \text{AG} \\ \text{[hat}_i \end{array} \right]$

(54) $\left[\begin{array}{c} \left[\text{Hans}_i \right] \\ \text{S COMP} \end{array} \right] \left[\begin{array}{c} \left[\text{AG} \right] \left[\text{liebt}_j \right] \\ \text{S INFL AUX} \end{array} \right] \left[\begin{array}{c} \left[\text{e}_i \right] \left[\text{Maria e}_j \right] \\ \text{S NP VP} \end{array} \right] \\ \left[\begin{array}{c} \text{e}_k \\ \text{INFL} \end{array} \right] \right]$

Crucially, in German (as in English and Italian) INFL must contain lexical material in order for Move INFL to apply (see Chapter Two). If raising into AUX is blocked, inversion is blocked.

We have proposed that at the initial setting of the AG/PRO parameter, AG is identified as PRO. We thus expect that German-speaking children will produce subjectless sentences. The OV sentences, discussed by Roeper, confirm this hypothesis. (As noted earlier, German is not a pro-drop language.) The AG/PRO analysis makes a further prediction for early German, however; namely, that the raising of the verb into AUX will be blocked (since AG/PRO would be governed). As noted above, if raising into AUX is blocked, inversion is impossible. Thus the (S)OV word-order attested in the language of young German children is predicted. The early grammar will not generate (S)VO, since this is the output of the raising and inversion processes. Thus, German children adopt a 'head last' constituent order (based on the order of elements in adult subordinate clauses) (Roeper, 1973). The early grammar

the sentence in (1a), for example, it is arguably the case that the presence of the subject follows from this principle insofar as the verb hit (or more precisely, the VP which it heads) does determine a subject Θ -role, let us say agent. By the Projection Principle, if the subject position is Θ -marked, then this position must be represented at all syntactic levels. However, as Chomsky (1981) and others have noted the subject position is obligatory even in the absence of Θ -marking. Thus, the verbs seem and appear, for example, require an expletive subject.

- (2) a. It seems that John is crazy
b.*Seems that John is crazy

On the basis of such evidence, Chomsky (1981; 1982) concludes that the obligatoriness of the subject position is independent of thematic considerations; that is to say, it is not derivable from the Projection Principle. He thus proposes that the following statement be added to the grammar.

- (3) All clauses must have subjects

The obligatoriness of the subject position may also be represented by the base rule in (4), which is assumed to be universal.

(4) S → NP INFL VP

Given the expansion in (4), particular verbs (or predicates) will then determine whether the subject position is thematic or non-thematic. Thus, the verb hit, but not seem, selects a referential subject. Crucially, however, some subject is required in both instances. The statement in (3) (or alternatively, the base rule in (4)), together with the Projection Principle, is referred to as the Extended Projection Principle (Chomsky, 1982).

The obligatoriness of the subject position in the absence of Θ -marking is a curious phenomenon, and one which requires explanation. In this section, we will suggest that this situation arises as a result of the Θ -Criterion and the Projection Principle operating on the early grammars. In other words, it is a result of the developmental process.

As a point of departure, we note that the inventory of verbs in any language can be broken down into three broad semantic classes. There are verbs which are lexically specified as selecting a thematic subject, for example, hit, see, love, etc. Following Zubizarreta (1982), we refer to this class as 'argument-taking' predicates. A second class of verbs are those which assign no Θ -role to the subject position, for example, seem, appear, etc. Thus, these verbs appear with expletive subjects, as in (5).

(5) It seems that John is late

Zubizarreta distinguishes a third class of predicates which she refers to as 'adjunct predicates.' Included in this class are the modals and aspectuals (semi-auxiliaries), for example, can, must, may, have to, going to, etc.

Zubizarreta notes that in contrast to verbs like seem and appear, the subject position of the modals and aspectuals does have semantic content. This is demonstrated by the fact that they do not take expletive subjects.

- (6) a.*It may that John is crazy
b.*It has (to) that we finish soon

She further notes that the adjunct predicates do bear a semantic relation to the subject as shown by the entailments below. (The following examples are from Zubizarreta.)

- (7) a. John must arrive at two →
b. It is required of John that he arrive at two
John has the obligation to arrive at two

- (8) a. Peter can come early →
b. Peter is able to come early

- (9) a. John may come early →
b. John is permitted (allowed) to come early
- (10) a. John is going to come early →
b. John has the intention to come early

Zubizarreta refers to the semantic relation which obtains between the modals (or aspectuals) and the subject as an 'adjunct Θ -relation.' On her analysis, the assignment of the adjunct Θ -role is optional. Where it is assigned, the sentence has the 'root' (obligation, ability, permission, intention), as opposed to 'epistemic' (probability, certainty, possibility, etc.), reading.

The assignment of argument Θ -roles and adjunct Θ -roles is governed by two distinct principles. The Θ -Criterion, given in Chapter One, refers to argument Θ -roles. Following Zubizarreta, we may revise this principle, as in (11).

- (11) Argument Θ -Criterion (Zubizarreta, 1982)⁴⁴

Each argument must bear one and only one argument Θ -role, and each argument Θ -role must be assigned to one and only one argument.

The assignment of adjunct Θ -roles is subject to the following condition.

(12) Adjunct Θ -Criterion (Zubizarreta, 1982)

An adjunct Θ -role must be combined with an argument Θ -role.

Thus, in the sentences in (7a), (8a), (9a), and (10a), the modal or aspectual assigns an adjunct Θ -role to the subject, which also receives its argument Θ -role from the main verb.

Having outlined the three classes of predicates, let us turn to some acquisition facts. It is well-known that the first verbs to be acquired by the child are those which refer to actions (e.g., jump, run, throw, etc.), or changes in state of some object (e.g., broke, fell, open, etc.) (Nelson, 1973; Antinucci & Miller, 1976). Given the previous typology of predicates, we may say that the child's inventory of verbs is initially restricted to argument-taking predicates.⁴⁵ At a later point (corresponding to Bellugi's (1967) Stage B) the adjunct predicates emerge, i.e., the semi-auxiliaries. The modals are delayed for the reasons discussed in this chapter, though they too are adjunct predicates. Finally, at a much later point the child's inventory of verbs comes to include the 'non-argument-taking predicates' like seem, appear, etc.⁴⁶ We should also note that the passive construction, in which no Θ -role is assigned to the element in [NP,S]

position, is also a very late acquisition, appearing at around age four or five (de Villiers & de Villiers, 1978); Maratsos, 1977). The order of emergence of the different predicate types suggests a clear developmental pattern. Children first acquire those predicates which select an argument subject. Let us refer to this stage as Stage α . They then learn the adjunct predicates, which also require an argument subject, but which need to be generated together with an argument-taking predicate (cf. The Adjunct Θ -Criterion). This is Stage β . Finally they acquire those predicates which do not assign a Θ -role to the subject position. This is Stage γ . The order of emergence of these three predicate types is most probably related to the relative transparency of their meanings.

Thus, during Stage α , the child's verbs include only those which Θ -mark the subject position, and (if transitive) an object. By the Projection Principle and the (Argument) Θ -Criterion, both of these positions must be represented in the syntax, containing either a lexical NP, or in the case of the subject, a null pronominal (cf. the AG/PRO parameter). Now let us consider a second developmental fact, namely, that the child must at some point determine the position of the verb relative to its arguments. In other words, he must learn the word-order of his particular language. As we have already noted, the child establishes word-order at a strikingly early age.

Once the child begins concatenating words, they are in the correct order in those languages in which word-order is fixed (Brown, 1973). Similarly, Lust and Wakayama (1981) report that young children acquiring Japanese (a relatively free word-order language) "show a complex sensitivity to both linear order and to constituent structure and their interrelation" (p. 86). The results of their experiments suggest that "in the early stages children associate constituent structure with basic word-order (in this case SOV or V-final order)" (p. 86).⁴⁷

It thus appears that the child fixes word-order related parameters at a point at which his inventory of verbs is restricted to those which select an argument subject--during the stage which we have referred to as Stage α . Let us now adopt the hypothesis that word-order related parameters may be set only once.⁴⁸ If this is the case, then the basic expansion of S, given in (4), is indeed "fixed" during Stage α . That is to say that with respect to the expansion in (4) the grammar is stabilized very early in development, and not subject to readjustment. Recall that all of the verbs which are acquired during Stages α and β require an argument subject. Thus, by the Projection Principle, this position must be represented in the syntax. By hypothesis, the later emergence of the Stage γ verbs, which do not θ -mark the subject position, cannot affect the shape of the rule in (4). It follows

then that the subject position of non-argument-taking predicates, raising verbs, for example, must be syntactically represented. Where the grammar does not license a null subject, the position contains a lexical expletive, as in English. On this account the obligatoriness of the subject in the adult grammar, expressed by the statement in (3), is derivable from independent principles of grammar, i.e., the Projection Principle, only when viewed from a developmental perspective.

The above proposal rests crucially on the assumption that the Stage α verbs are in fact argument-taking predicates for the child (as they are for the adult), an assumption which we have not yet attempted to justify. Thus, we might ask if there is reason to believe that the Θ -marking properties of a particular verb are the same for the child and the adult. Let us briefly consider this question.

A rather common process in the child's acquisition of words is the phenomenon of "overextension," that is, the child uses a particular word to refer to an object or event which is inappropriate from the adult point of view. For example, a child may use the word "doggie" to refer to dogs, cats, horses, and cows. One hypothesis as to the nature of overextension, the Semantic Feature Hypothesis (Clark, 1973) (based on Katz's (1972) theory of decompositional semantics) is that the child identifies the meaning

of the word with only some subset of the features of the adult meaning. Or, to put it differently, the child picks out some salient property (or properties) of the referent of a particular word as the meaning of that word. In the "doggie" example, these properties might include 'four-legged furry animal.'

Although the acquisition of verbs has been less systematically studied than the acquisition of nouns, Bowerman (1977) notes that children also overextend their first verbs to include inappropriate actions. It is thus interesting to note that while the child's meaning for a particular verb may differ from the adult meaning in certain respects, it does not in general deviate from the adult verb in terms of its Θ -marking properties. To illustrate, Bowerman reports that one child first used the verb kick (at 17 mos.) as she kicked the floor fan with her foot. She continued to use it to refer to the action of kicking an object with her foot. She also used kick in its intransitive sense, for example, to refer to a row of cartoon turtles doing the can-can. On these occasions, the verb kick was used appropriately. However, the child also used kick while watching a moth fluttering its wings; just before throwing some object; and as she made a ball roll by bumping it with the front wheel of a kiddy car. Note that in all these instances there is an agent (an animate being acting under its own volition).

The agent is either moving a body part (theme), for example, the moth moving its wings and the child moving her arm to throw something, or the agent is acting upon a patient, for example, the child (or car) bumping into a ball.

The above evidence, which is admittedly slight, does suggest that in learning particular verbs, the child successfully extracts certain "core" aspects of the adult meaning including the verb's θ -marking properties, and that perhaps this is the basis for 'overextension' in the child's use of verbs.

Notes to Chapter III

¹We use the term 'subjectless sentences' in a pre-theoretical sense to refer to sentences without overt lexical subjects.

²The existential there is to be distinguished from the locative there, which is often found in early utterances, and which is often accompanied by pointing. Some examples follow.

- (i) There birdie (child is picking up a bird)
- Baby there (looking into crib)
- See under there (pointing to a chest)
- There's book (pointing to a book)
- My finger stuck
in there (referring to a record cabinet)

(From Bloom, Lightbown & Hood, 1975)

³It is not possible to illustrate the lack of modals for obvious reasons. We can, however, show sentences in which auxiliary be has been omitted.

- (i) Car going there
- Mommy sleeping

These sentences are discussed in Section 3.3.

⁴We use the method of 'rich interpretation' (Bloom, 1980) in glossing the sentences in (2). This method of interpreting child language is based on inferences about the child's intended meaning given the context and circumstances under which a sentence is uttered. For example, the sentence 'no morning' occurred in the following exchange.

(Gia is eating lunch at 1:00 p.m. Mommy and Lois are in the kitchen with her)

Mommy: Good morning.

Gia: No morning.

(From Bloom, 1970)

Similarly, the sentence 'yes, is toys in there' was uttered in the following context.

(Gia tries to lift a toy bag)

Mommy: Is that heavy?

Gia: Yes, is toys in there.

(From Bloom, Lightbown & Hood, 1975)

⁵'Time' refers to taping session. There is no relation between Kathryn at Time I (K I), Eric I (E I), and Gia I (G I) other than this is the first session for each child.

⁶Subjectless sentences also appear at Eric I and Gia I. At this point, however, there were no sentences with lexical subjects. We therefore make no claims regarding the status of these sentences in the first period of these two children.

⁷The 'Stages' in Brown, Cazden & Bellugi (1973), and Brown (1973) are defined in terms of Mean Length of Utterance (MLU), and are distinct from Bloom's 'Times' which are simply labels for taping sessions. We list below the MLU for each of these Stages, and the upper bound on utterance length for each Stage (Brown, 1973).

<u>Stage</u>	<u>MLU</u>	<u>Upper Bound</u>
I	1.75	5
II	2.25	7
III	2.75	9

The MLU is calculated by counting the number of morphemes in each of 100 consecutive utterances beginning with the second page of the transcript (Brown, 1973). It should be noted that the MLU is heavily skewed by the preponderance of one word utterances at these earlier stages, many of which are appropriate in normal conversation. As indicated by the numbers under the category 'Upper Bound,' children are producing utterances up to length 5, 7, and 9 during Stages I, II, III, respectively. Moreover, the fact that the MLU is calculated on the basis of the utterances at the beginning of the transcript may in fact be lowering the value given that children in general become more talkative as the session goes on.

⁸Bloom (1970) argues, in contrast, that the child omits subjects (and other constituents) in response to

increased syntactic complexity. She illustrates the phenomenon of "reduction" with a group of sentences containing the verb make (which is also used causatively), saying "when the subject of the sentence was expressed either the verb, the object, the adverbial phrase or more than one of these was not expressed" (p. 146). However, of the 18 utterances containing subjects, only two were missing the object or (embedded) verb, given below.

- (i) Kathryn ● make ● under bridge
(Kathryn make lamb go under bridge)
- (ii) Kathryn ● make again
(Kathryn make blocks again)

Thus, most often it was an inferred adverbial phrase that was omitted. Unlike subject or object NPs, however, adverbial phrases are not arguments of the verb (i.e., they are not projections of lexical properties) and thus it is extremely difficult to infer that such a phrase has been omitted when it does not appear in the child's utterance.

More generally, it seems to us that the method of 'rich interpretation' (see Note 4) is valid only where it receives independent grammatical support; that is, we can infer that some constituent has been omitted only where the grammar requires that it be present, as is the case with NP arguments. (See discussion of the Projection Principle in Chapter I and Appendix.) When the child utters 'I want ice cream,' we cannot assume he means to say 'I want to eat ice cream with a spoon in the kitchen now' even if the latter utterance would be appropriate given the situation. This is in essence what Bloom does in her discussion of the make sentences when she says, "If all the possible constituents were filled, the ultimate result might be the production of such a sentence as 'Kathryn want make more choochoo train under bridge { again }'" (p. 146).

We should also note that just as 2 of the sentences containing subjects lacked a verb or object, so 2 of the 37 sentences without a subject also lacked a verb or object.

- (i) make ● more under bridge
(I make lamb go more under bridge)
- (ii) make ● car under bridge
(I make a car go under bridge)

Given these considerations the make sentences do not provide support for the claim that subjects are missing due to

syntactic complexity. Furthermore, the 'complexity hypothesis' provides no account of the absence of lexical subjects in the simple sentences like those provided in (3), (4), (5), (6), in the text.

Bloom's other evidence for the 'complexity hypothesis' comes from negative sentences. She observes that sentence subjects are fully productive in affirmative sentences prior to negative sentences. On her account, the negative element creates additional syntactic complexity forcing the child to "reduce" the sentence, usually by omitting the subject. The first question which arises is why is it usually the subject which is omitted to reduce complexity. Although Bloom does not explicitly address this issue, she does note that "the constituents that were most often deleted in these early negative sentences were sentence subjects, which were not within the immediate scope of the negation" (p. 163). On our analysis, the possibility for phonologically unrealized subjects is a grammatically governed phenomenon. However, the presence of a lexical subject in a particular token utterance depends on pragmatic factors (as it does in adult pro-drop languages like Italian). It is therefore probable that lexical subjects are more frequently absent in negative sentences because negatives are usually uttered in response to a previous utterance (particularly in the case of children), and thus the topic of discourse is established. We will discuss the pragmatic constraints on subjectless sentences in greater detail in Section 4.2.

⁹Chomsky (1981) suggests that the it subject of weather verbs may be distinct from the it subject of raising predicates in that the former is a 'quasi-argument.' The distinction between the two its is motivated by the observation that weather it, unlike raising it, may control PRO.

- (i) It sometimes rains after PRO snowing
- (ii) *It seems that John was guilty after PRO appearing that he had a strong motive

Chomsky notes that "weather it behaves as though it were referential (i.e., it acts as a controller), but it can have no referent" (p. 324). Thus, on Chomsky's analysis, weather verbs select a 'quasi-argument,' i.e., an argument which lacks a referential function. For the purposes of this discussion, we abstract away from the 'quasi-argument' status of weather it. It seems fair to assume that from an acquisition perspective the crucial factor is the non-referentiality of it in both instances. But see Note 45 for further discussion.

¹⁰There are to our knowledge two languages which appear not to obey the generalization that pro-drop languages do not have lexical expletives--thirteenth-century Italian and Modern Hebrew. In Old Italian the pronoun egli (from the Latin illi meaning that one) was used expletively. The following examples, cited by Fornaciari (1979) are from the written works of Boccaccio and Petrarca.

(i) Egli era in questo castello una donna vedova (Boccaccio)

'There was in this castle a widowed woman'

(ii) E s'egli e ver che tua potenza sia nel ciel si grande... (Petrarca)

'And if it is true that your power is in the heaven so big...'

(iii) O figliuola mia, che caldo fa egli? Anzi, non fa egli caldo veruno. (Boccaccio)

'O my daughter, how hot is it?'

'On the contrary, it's not hot at all'

It is not clear, however, that egli (in its expletive sense) was part of the spoken language or whether it was reserved for literary purposes.

In Modern Hebrew there is also a lexical expletive ze (it) which is used optionally in extraposition constructions (Borer, 1981).

(i) (ze) margiz 'oti she Itamar tamid me'axer

'(It) annoys me that Itamar always late'

There are two factors which may be responsible for this state of affairs. First, although Hebrew allows phonologically null subjects, their distribution is much narrower than in Italian or Spanish. We find pro-drop only in 1st and 2nd persons in the past and future tenses. Thus it is possible that Hebrew has the lexical expletive because it is not a "pure" pro-drop language, although we do not at present know how to formalize this proposal.

There may also be non-grammatical reasons for the exception to the generalization in Hebrew. Hebrew, in its modern form, is a relatively new language, which was revived (from Biblical Hebrew) and codified at the beginning of this century. Greenberg (1965) also notes that it

has "undergone a radical Europeanization due to the European origin of most of its creators (emphasis mine)." Thus it may also be the case that ze is semi-artificial, and therefore, highly marked. If so, we would expect it to be a rather late (possibly scholastic) acquisition.

¹¹"The pronominal subject is correctly used in Spanish for reasons of expressive emphasis, or to avoid possible ambiguities, according to the particular circumstances of each case." (NMH)

¹²"The subject form of the personal pronouns is used necessarily when . . . the subject must be distinguished from other persons, or contrasted with them in some way; when the person inflection on the verb is the same as another (person), where there could be misunderstanding . . ." (NMH)

¹³Enç (1982) argues that subject pronouns in Turkish (a pro-drop language) are used to signal a change in discourse topic. Her analysis seems to be true for Italian and Spanish as well.

¹⁴Here we depart from Jaeggli (1980) and Chomsky (1981) where it is assumed that the Avoid Pronoun Principle is a strictly grammatical principle.

¹⁵In order to explain the tendency to select particular morphemes, Brown and Fraser suggest that the child is responding to a "recency" effect. That is to say, the child pays particular attention to material in final position or to those items which are more heavily stressed. While recency and stress probably play a role in the child's performance in imitation tasks, it is difficult to see how they can account for the omissions in spontaneous speech.

¹⁶This is reminiscent of Roeper's "input filter". See Roeper (1978) for discussion.

¹⁷We should note that this assumption is not shared by everybody. Bever (1970), for example, claims that the "linguistic" grammar, i.e., the description of grammatical knowledge which takes linguistic intuitions as its data base, plays no role in production or comprehension. He states that "a proper understanding of the behavioral and phenomenological nature of 'basic intuitions' forces us to

reject the claim that a linguistic grammar is in any sense internal to such linguistic performances as talking or listening" (p. 324).

If Bever is correct, we are forced to conclude that any resemblance between the sentences we understand and produce and those that we judge to be grammatical is entirely fortuitous. Moreover, one wonders what sort of evolutionary quirk gave rise to a "linguistic" grammar given that in the normal course of events people are not called upon to give grammaticality judgments.

¹⁸This conclusion is based on the finding that very young children (2;0) acquiring Turkish (a highly inflected language) used the nominal inflection, rather than word-order, in determining the grammatical relations of test sentences in a series of comprehension tasks. Slobin (1982) also found that the sensitivity to inflection (in Turkish children) developed earlier than the sensitivity to word-order (in children acquiring English and Italian). On the basis of the comparative data, he argues for an acquisition principle based on a syntactic-typological distinction--word-order vs. inflectional languages. The principle is roughly that inflection is easier because it is string local, while word-order is a global clue and thus perhaps harder for learners with limited information processing capacities. Wanner & Gleitman (1982) note, however, that in speech production word-order seems to precede inflection. Moreover, they point out that there seems to be no main-effect difference between Turkish and the other two languages. These two facts cast serious doubts on the claim that inflection is prior, in some sense, to word order.

The results do, nevertheless, provide evidence that children are sensitive to inflectional morphology at a very early age. Moreover, the fact that the Turkish children attend to the nominal inflection while English and Italian-speaking children attend to word-order suggests that young children have much more of the particular grammars of the languages they are acquiring than they are sometimes given credit for. It shows, for example, that English-speaking children know that grammatical relations are configurationally defined in their language. If children were operating under some general set of cognitive (Sinclair & Bronckart, 1972) or perceptual (Bever, 1970) strategies we would not expect these language particular facts to be particularly salient.

We should also note that Weist et al. (in press) report that Polish-speaking children have complete productivity in the tense and aspect system of Polish prior to

age 2;6. In Chapter Four we will discuss the grammatical development in Italian-speaking children. Here again, we find they have no problems in learning the verbal inflectional system.

¹⁹There is the additional fact that the meaning of 'actional' verbs (which are the first to emerge (Nelson, 1973)) is inferable from context. At the very earliest stage one would expect the child to rely heavily on contextual information in interpreting speech.

In the Appendix we will suggest that there is a developmental sequence in the acquisition of verbs which may be related to the relative transparency of the meanings of the verbs. However, the prior appearance of the semi-auxiliaries relative to the modals cannot be explained by semantic or conceptual considerations.

²⁰The semi-auxiliaries undergo none of the rules which typically affect the modals. The following sentences are from Pullum & Wilson (1977).

(i) Subject AUX inversion

We hafta use up all the milk
*Have we to use up all the milk
*Hafta we use up all the milk

(ii) Tag Formation

*We hafta use up all the milk today, haven't we (to)

(iii) Negative Contraction

*We haven't to use up all the milk today

(v) Quantifier Floating

*We have all to use up as much milk as we can

(vi) Adverb Placement

*We have hardly to do anything that we don't want to

Pullum & Wilson further point out that the semi-auxiliaries exhibit the syntactic behavior of raising verbs in that they take expletive elements and idiom chunks as subjects.

(vii) There is going to be a riot in the park
cf. There seems to be a riot in the park

*There tried to be a riot in the park

(viii) Tabs have to be kept on the students

cf. Tabs seem to have been kept on the students

*Tabs wanted to be kept on the students

By all the available syntactic tests, the semi-auxiliaries are main verbs, and more specifically, raising verbs. Thus, they are grammatically equivalent to the Italian modals. We will consider this issue further when we compare the emergence of the modals in Italian-speaking children with that of the English-speaking children in Chapter Four.

²¹In an earlier draft of this chapter, presented at the West Coast Conference on Formal Linguistics (WCCFL II), I argued that the modals were unanalyzable as main verbs (i.e., raising verbs) because the early grammar does not license A-binding, that is, binding between 2 argument positions (Chomsky, 1981). Thus, the following sentence would be impossible during G_1 .

(i) John_i [may [e_i go to the store]]
VP

On this account, the child acquiring English could not assume that the modals in English behave like the Italian modals. This hypothesis was subsequently falsified by the facts noted in this section, namely, that children do acquire at this stage semi-auxiliaries which are raising verbs.

I am indebted to R. Stockwell for first pointing out to me that the semi-auxiliaries were a potential problem for my analysis.

I should note, additionally, that I am assuming, following Zubizarreta (1982) that the modals (and aspectuals) are "adjunct predicates," which do not assign an "argument θ -role" to the subject. Thus a control analysis of modals is excluded a priori by the θ -Criterion. In (ii) the matrix subject does not receive an "argument θ -role."

(ii) John [may [PRO go to the store]]
VP S

See Note 18 in Chapter Two and the Appendix to this chapter for further discussion.

²²Klein (1982) argues that Bellugi's account is inadequate in two respects. First, if can't and don't are members of the category NEG along with no and not, they should have the same distribution. Klein notes, however, that can't and don't appear only pre-verbally, while no and not appear in sentence initial position. Klein's first objection is based on a misinterpretation of the facts. Can't and don't appear during Stage B which is the stage following the point at which the negative element appears in sentence initial position. During Stage B the four negative elements do have a shared distribution: they all appear in pre-verbal position, as we note in the text.

Klein's second objection is well-taken, however. She argues that if don't and can't are not members of the category AUX, we have no account of why the modals appear soon after in precisely the same position. We believe that the account proposed in the text provides an answer to this question.

²³It may be that the negative element is generated directly in VP in (33). For the purposes of our discussion, the precise position of the negative is irrelevant.

²⁴The present perfect formed with the auxiliary have and the past participle (e.g., have gone) is entirely missing through Stage V (Brown, 1973), and thus we do not discuss the auxiliary have.

²⁵Brown (1973) points out that this is the same generalization noted by Labov (1969) for Black English. In Black English, be may be "deleted" in those contexts in which contraction is possible in Standard English.

²⁶Another way of saying this is that the child recognizes that be is a verb and "projects" a category VP. This is consistent with recent proposals (Farmer, 1980; Stowell, 1981) that phrase structure is defined as a projection of lexical categories through the \bar{X} system into a set of categorical phrases, rather than by an independent set of rewriting rules. In discussing the implications of this proposal for acquisition Stowell states,

If a preliminary morphological analysis of the lexicon provides the language faculty with the knowledge that a certain number of lexical categories are differentiated, then the LAD is tacitly prepared for the existence of a set of phrasal projections at each bar level corresponding to each category. (p. 70)

See Stowell (1981) for further discussion.

²⁷It is important to distinguish "contractible" from "contracted." Thus, even if the child were to hear a sentence containing the "contractible" be in an uncontracted form, for example, I am going, he knows that this is a context in which be may be contracted, and hence, that it must be in AUX.

²⁸Note that this is not an unreasonable hypothesis insofar as there exist languages in which predicative constructions (in the present tense) do not contain the verb be, for example, Russian and Hebrew. Some examples follow.

- (i) Ivan spion (Russian)
'Ivan spy'
(Ivan is a spy)
- (ii) Nataša v kremle
'Natasha in Kremlin'
(Natasha is in the Kremlin)
- (iii) Sarah yafta (Hebrew)
'Sarah pretty'
(Sarah is pretty)
- (iv) Itamar tamid me'axer
'Itamar always late'
(Itamar is always late)

²⁹Brown also considers a fourth category, the 'uncontractible auxiliary.' This is the auxiliary which we find in sentences like 'Yes, he is' (cf. *Yes, he's). Given that this form is only used in response to a previous utterance, it is unclear to us how Brown was able to determine the obligatory contexts for the uncontractible auxiliary, and hence, how he was able to determine when this element reached "criterion" (i.e., 90% correct use in obligatory contexts). Because of the indeterminacy associated with this element, we omit it from our discussion. We should note, however, that according to Brown,

the 'uncontractible auxiliary' is acquired at roughly the same time as the 'contractible copula' and the 'contractible auxiliary.' The rank orders of these last three are 11.66, 12.66, and 14.00, respectively. On our analysis the contractible forms are filtered out of the input data because, by the child's (correct) hypothesis, be must be in AUX to undergo contraction. Because the 'uncontractible auxiliary' is generally used in response to a sentence containing a contractible be (e.g., Is he coming?, Is he happy?), we expect it to be late acquired insofar as the be which occurs in the questions is unanalyzed by the early grammar.

³⁰Samples of Kathryn's language beyond Time III are not reported in Bloom (1970) and Bloom, Lightbown & Hood (1975). Thus the point of shift for this child is a projection based on the fact that her language at Time III exhibited many of the properties which usually precede the shift (found in Eric V and Gia V). Bloom notes, for example, that lexical subjects are productive in affirmative sentences at K III though sometimes absent in negatives. (See Note 9.) Moreover, we find can't and don't and the semi-auxiliaries at K III.

³¹We should note at this point that it is this "deficiency" of data which poses serious problems for inductive (data-driven) models of language acquisition. As Hornstein & Lightfoot (1981) note, the data are deficient in three respects. First, the sentences the child hears may consist of utterances with pauses, slips of the tongue, incomplete thoughts, etc. (i.e., performance errors). Second, the available data are finite though the child acquires the ability to deal with an infinite range of novel sentences. Finally, children are not informed about complex and rare sentences, paraphrase and ambiguity relations, and as we noted in the text, ungrammatical sentences.

The linguist is in a privileged position with respect to data. He has access to all of the above. Thus as noted in Klein (1982) and White (1981), the metaphor of the child as "little linguist" is entirely inappropriate.

³²But see Note 10.

³³We are assuming that the child "knows" that it and there are expletives. This information is available to him if he knows the meaning of predicates like is raining, or is no more ice cream. Part of knowing the

"meaning" of a predicate is knowing its thematic properties, for example, whether or not it assigns a subject θ -role, like agent, experiencer, etc. We discuss this further in the Appendix.

³⁴There are two reported occurrences of expletives at the Time immediately preceding the shift.

(i) It's dark outside (G V)

(ii) There's a birdie in there (E V)

(Bloom, 1970; BLH, 1975)

It is difficult to pinpoint the source of these "precocious" expletives. An occasional sentence containing an expletive prior to the shift may be part of a "fixed expression." However, the fact that the two sentences above occur immediately preceding the shift suggests that they are in fact analyzed as expletives.

It is well-known that children's language behavior does not change over night. That is to say that the various "stages" of acquisition, for example Bellugi's (1967) Stages A, B, C, etc., are idealizations. Between these stages there are "fuzzy" areas in which some utterances resemble the language of the previous stage, while others resemble the language of the stage to come. (See Bellugi, 1967, for discussion.) In our discussion of grammatical development we have also idealized to a model in which parameters shift in an instant. It is clear, however, from the "fuzzy" data that there is a period during which the parameters may waver between two values. If this is the case the "precocious" expletives may mark the beginning of the shift.

³⁵Roeper (1978) has suggested that the child attends to those data which are relevant to a current hypothesis. With respect to parameter setting, and the AG/PRO parameter in particular, this would mean that the child "tunes in" to the lexical expletives when the time comes to set the AG/PRO parameter at the correct value for a particular language, and that prior to this point they are simply irrelevant.

³⁶If the topic of discourse remains constant, the child may also infer that the pronoun is not needed to signal a change in discourse topic.

³⁷For the purposes of this discussion we ignore the problem with the 'expletive-trigger' hypothesis noted previously.

³⁸As Bob Fiengo has pointed out to me, there is, in principle, another manner of determining the real triggering data. We might "deprive" a child acquiring English of lexical expletives, and see if the grammar restructures in spite of the deprivation. For obvious reasons, this experiment cannot be carried out, however.

³⁹Greenfield & Smith (1976) claim that the child's view of what is contextually salient (and therefore likely to be omitted from the utterance) may be different from the adult's. Thus in response to our criticism, Greenfield & Smith could argue that the inferences we made in the text about the "informativeness" of the elements in the sentences may not be correct for the child. There is, however, an obvious problem with this approach. On the one hand, Greenfield & Smith wish to claim that we can explain the omissions by determining what is "informative" for the child. On the other hand, we have no access to the child's perceptions independent of what we can infer from overt behavior, in this case, language. Formulated in this fashion the theory is circular and entirely untestable. If we are to avoid the circularity, we have no choice but to use our own perceptions of what is uninformative or predictable in the context, and see if this is in fact what the child omits.

⁴⁰In the earliest utterances the object of a transitive verb is occasionally missing (Bloom, 1970). The number of omissions, however, is far too low to be the product of a regular grammatical process. More likely, these errors are performance errors, though this is an empirical question.

⁴¹The German data are reported in Park (1970).

⁴²This preposing rule may move any phrasal category in COMP. Thus all of the following are possible. (From Safir & Pesetsky, 1981.)

(i) [Gestern] [hat Hans das Buch dem Herrn gegeben]
 COMP S

'Yesterday has Hans the-ACC book the-DAT man given'

(ii) [Hans] [hat das Buch dem Herrn gestern gegeben]
COMP S

'Hans has the book the man yesterday given'

(iii) [das Buch] [hat Hans dem Herrn gestern
COMP S

gegeben]

'The book has Hans the man yesterday given'

(iv) [dem Herrn] [hat Hans das Buch gestern
COMP S

gegeben]

'The man has Hans the book yesterday given'

Note that in all cases 'Move INFL' has applied to adjoin the auxiliary hat to sentence initial position.

⁴³We will assume (roughly following Safir and Pesetsky, 1981) that German and English differ with regard to the featural specification of AUX. In German AUX is specified by features non-distinct from V, while in English it is specified as [+AUX, +V].

⁴⁴This is a slightly modified version of the principle as presented in Zubizarreta (1982) which refers to 'argument chains.'

⁴⁵Although they are not among the earliest predicates to be acquired, we also find the weather predicates during Stage α , for example, the first two sentences in (45). The fact that these predicates emerge (roughly) alongside the argument-taking predicates provides additional support for Chomsky's (1981) proposal that the weather predicates do select an argument in some sense, and are thus distinct from raising predicates. (See Note 10.) It nevertheless appears to be the case that children treat weather it as an expletive subject. As we suggested in Note 10, this is most probably due to the fact that this element does not have real referential properties.

⁴⁶Although to our knowledge the acquisition of these verbs has never been specifically investigated, raising verbs like seem, appear, etc., are unattested in early speech. Constructions involving these verbs do not figure among the complex sentences reported by Limber (1970 and Bloom et al. (1980) in their studies of the acquisition of complex sentences.

⁴⁷The youngest children in this study were age 2;5. However, a preference for SVO order has been noted as early as age 2;0. (Murata, 1961.)

⁴⁸This is following the suggestion in Roeper (1978) that "hypotheses about basic word-order may be irreversible." (p. 10).

CHAPTER FOUR

THE GRAMMAR OF EARLY ITALIAN*

1. Introduction

In the previous chapter we examined the effects of the AG/PRO parameter in the language of young children acquiring English. Additionally, we proposed that the initial setting of this parameter, in which AG is identified with PRO, accounts for the (S)OV word order observed in the speech of young German children. In this chapter we consider various aspects of the development of a third language, Italian.

By our hypothesis, the value AG = PRO is the initial value of the AG/PRO parameter, that is, the value of the parameter in advance of linguistic experience. We thus expect that early Italian and early English will have common properties--those which are directly related to this parameter, though the two early languages may differ in other respects. In Section 1 we will compare the two early languages.

One salient property of early Italian is the pervasiveness of grammatical agreement, for example, Subject-Verb agreement, Noun-Modifier, etc.¹ Agreement phenomena in early language are of particular interest in

that they are an expression of (strict) grammatical knowledge. An adequate description of grammatical agreement must make reference to syntactic categories and relations, for example, NP, Adjective, Subject, Verb, etc. Thus, to the extent that early language exhibits agreement, we have rather direct evidence of the child's developing syntactic system. In Section 2, we examine Subject-Verb agreement in early Italian. As will become apparent, children who are born into languages with rich verbal inflection, for example, Italian, develop S-V agreement at a strikingly early age.

From our perspective the most interesting data are those in which agreement rules appear to be violated. It is in these instances that we see the manner in which the early grammar differs from the adult grammar, and thus whether the parameters of UG are sufficiently "broad" to account for the variation. For children acquiring Italian, S-V agreement "breaks down" in a well-defined domain, namely, in the presence of the subject clitics si and ci (discussed in Chapter Two). In Section 3 we investigate the status of these clitics in early Italian, and the reason that they "interfere" with the agreement process.

2. The Early Grammars of English and Italian: A Comparison

As we discussed in the previous chapter, one of the most notable characteristics of early English is the frequent absence of lexical subjects. We have argued that these 'subjectless' sentences contain a phonologically null pronominal, pro--the appearance of which is licensed by the pronominal AG, i.e., AG/PRO. Recall that these null subject sentences alternate with sentences containing lexical subjects. As one might expect, the situation is much the same in early Italian. The following sentences are a representative sample.²

(1) a. Ha collo lungo, lungo, lungo (D 2;2)

'Has neck long, long, long'

(= has a long, long, long neck)

Eto è il galletto (eto = questo)

'This is the rooster'

E bello, eto è piccolino

'is beautiful, this is little'

- b. Io vado su vedere mamma un bimbo (H 2;1)
 'I go upstairs to see mommy a baby'
 Cos'è, vado a vedere cos'è
 'What is, go to see what is'
 (=What is it, I go to see what it is)
- c. Taglio (F 2;3)
 'cut'
 (=I cut)
 Giorgio le taglia
 'Giorgio them-cuts'
- d. Chelo micino no è piccino, no è butto (L 1;11)
 è bello (chelo = quello, no =non, butto = brutto)
 'That kitten not is little, not is ugly,
 is beautiful'
- e. Questo è mio papa (H 2;0)
 'This is my daddy'
 E mia palla
 'Is my ball'
 (=it is my ball)

In the sentences in (1) the subject is either phonologically null, or lexically realized in pre-verbal position. The referent of the null subject is definite, and can be inferred from context (as in English), and from the agreement inflection on the verb. (We return to this in the next section.) Recall that in Italian the lexical

subject may also appear in post-verbal position. Early Italian exhibits the same distribution of lexical subjects as adult Italian. The subject may appear pre-verbally, as in the examples in (1), or post-verbally. Consider the following sentences in which we find pre-verbal, post-verbal, and null subjects in the same transcript.

(2) a. Pange (=piange)³ (A 2;4)

'Cries'

(=She cries)

io no piango

'I no cry'

Si, pange anche lei, l'Alessia

'Yes, cries also she, Alessia'

(Yes, Alessia, she cries also)

b. Si, li ho visto io (D 2;3)

'Yes, them-saw I'

io, io vito li asinelli (vito = visto)

'I, I saw the donkeys'

E attaccata?

(C 2;2)

'Is attached?'

(=Is it attached?)

E attaccata quella?

'Is attached that one?'

Questa mela attaccata dell'albero
'This apple attached from the tree'

c. E vola in alto (c 2;2)

'And flies up high'
(=And it flies up high)

E andata a letto la farfallona
'Went to bed the butterfly'

A cola perche i bimbi piangono? (cola = scuola)
'In school why the babies cry?'

d. Cosa fa? (I 2;1)

'What does?'
(=What does it do?)

Cosa fa il tore? (tore = registratore)
'What does the tape recorder?'
(=What does the tape recorder do?)

e. No, non ti prendo ... in giro (I 2;3)

'No, not you-take in circle'
(=No, I don't tease you)

Io butto tutte le foglie
'I throw all the leaves'

Ho detto brutto io'
'Said ugly I'
(=I said 'ugly')

f. Sono giù (L 1;11)

' am downstairs'

(=I am downstairs)

Io vado fuori

'I go outside'

Pendo io

'Take I'

g. E caduto giù (L 2;2)

'Fell down'

(=It fell down)

Io non vado via

'Not go away'

Dopo vene mia mamma (vene - viene)

'After comes my mommy'

Early Italian thus resembles early English in that lexical subjects alternate with null subjects and null subjects have a definite pronominal interpretation. On our analysis this follows from the fact that AG is pronominal in both grammars. The two early languages differ, however, with respect to the possibility of post-verbal subjects.

Recall that the post-verbal subject phenomenon is related to the level at which rule R applies in a particular grammar. In Italian, Rule R has the option of

applying in the syntax, and thus AG (in V) assigns nominative Case to the post-verbal NP. The child acquiring Italian hears post-verbal subjects and may therefore deduce that Rule R applies in the syntax in that language. Similar evidence is not forthcoming in English, and hence, the English-speaking child adheres to a strict SVO word order (Brown, 1973). That is to say, he assumes that AG remains in INFL at S-structure and thus the subject NP must appear in [NP,S] position to receive nominative Case.

The above proposal rests crucially on the assumption that the rules of (abstract) Case assignment and the Case Filter are operative in the early grammars. Let us now discuss the empirical evidence that this is indeed the case.

2.1 Case Assignment in the Early Grammar

In Italian, as in English, the effects of (abstract) Case assignment are visible on pronouns (but not on full lexical NPs). In English, we have the nominative pronouns I, he, she, and the accusative pronouns me, him, her. Similarly in Italian, the 1st and 2nd person nominative and accusative pronouns are distinct. The pronouns io (I) and tu (you) are nominative, while me (me) and te (you) are accusative. Moreover, in Italian there exists a set of pronominal object clitics which appear immediately preceding the verb. A (partial) clitic paradigm is given below.

	<u>Accusative</u>		<u>Dative</u>
(3)	<u>lo</u> 'him,'it' (mas. sing.)	<u>mi</u>	'me,'to me'
	<u>la</u> 'her,'it' (fem. sing.)	<u>ti</u>	'you,'to you'
	<u>le</u> 'them' (fem. plu.)	<u>gli</u>	'to him'
	<u>li</u> 'them' (mas. plu.)	<u>le</u>	'to her'
		<u>ci</u>	'us,'to us'
		<u>vi</u>	'you' (plu.)'to you' (plu.)'

The following sentences illustrate the position of the clitics.

- (4) a. Io lo vedo
'I him-see'
- b. Tu gli hai dato il libro
'You to him-gave the book'
- c. Tu glielo hai dato
'You to him-it-gave'

Young Italian speaking-children never use these pronouns incorrectly. That is to say, subject pronouns are nominative, while objects are non-nominative. Let us first consider subject pronouns.

- (5) Io vado su vedere mamma un bimbo (H 2;1)
'I go upstairs to see mommy (of) a baby'

- Si li ho visti io (D 2;3)
 'Yes, them-saw I'
io vado fuori (L 1;11)
 'I go out'
Tu pingi giu (pingi = spingi) (L 1;11)
 'you push down'
 E goso, tu o mangi, eh? (goso = grosso (T 2;0)
 'Is big, you it-eat, huh?

Note that in the sentences in (2) and (5) the nominative pronominal subject may appear in either pre-verbal or post-verbal position. This supports the claim that in the early grammar of Italian, henceforth (G_{IT}), Rule R may apply in either the syntax or the phonology, as in the adult system. Thus, while pronominal subjects are rare in early language, those that appear are correctly Case-marked. Ungrammatical sentences like the following, in which the subject is marked in the accusative Case, are unattested in early Italian.

- (6) a. *çMe vado fuori⁴
 'Me go out'
 b. *ç Vado me
 'Go me'

Like young Italian children, children acquiring English are fairly consistent in their use of correct Case marking.

- (7) I see choo-choo train
he look for it
show me
make him sit down

(BLH, 1975)

In early English, however, we do find subjects which are marked in the accusative Case, as in (8).

- (8) Me like coffee⁵
Me show Mommy

Note that if the sentences in (8) were due to "wrong" or inoperative Case assignment in the early grammar of English, we would expect the occurrence of nominative and accusative pronouns to be entirely random. In particular, we would expect errors of the following sort.

- (9) cMommy sees I

Sentences like that in (9), however, are unattested.⁶ The sentences in (8) do suggest, however, that English-speaking children have more difficulty than Italian-speaking children in learning the morphological shape of the nominative pronouns. That is to say that they may know that the subject is assigned nominative Case, but not know that this Case is realized as I, rather than me. Several reasons for the confusion suggest themselves. Note that in English a topicalized pronoun, or a pronoun in isolation, is always accusative, regardless of its syntactic function.

- (10) a. Me, I go to the movies on Friday nights
b. Him, he's really crazy

Similarly, consider the following possible exchange.

- (11) Child: Mommy, you do this.
Mommy: Me?

Confronted with evidence of the above sort, the English-speaking child might easily conclude that I and me are morphological variants of the nominative 1st person pronoun. Note that in Italian such contradictory data do not exist. The nominative pronoun I, for example, is always io. The exchange in (11) is given in Italian in (12).

- (12) Child: Mamma, tu lo fai
Mommy: Io?

It seems fair to assume that the sentences in (8) are not the result of incorrect Case assignment, but rather a reflection of the difficulty which exists in determining the morphological shape of the nominative pronouns in English. The more frequent sentences in (5) and (7) strongly suggest that Case assignment in the early grammars proceeds as in the adult systems.

The young child's use of pronominal clitics provides further evidence of rules of Case assignment in the early grammar. (Here we restrict our attention to Italian child language for obvious reasons.) Let us first briefly discuss clitics in the adult language. In Italian direct (and indirect) object clitic appear immediately preceding a verb which assigns accusative or dative Case. We may think of the clitic as absorbing the accusative or dative case, which would otherwise be assigned to a lexical NP in direct or indirect object position (Jaeggli, 1980; Borer, 1981), as in the following examples.⁷

- (13) a. La mangia [e]
 [+acc]
 '(he) it-eats'

- b. Mangia la mela
 [+acc]
 '(he) eats the apple'
- c. Mi parla [e]
 [+dat]
 '(he) to me-speaks'
- d. Parla a me
 [+dat]
 '(he) speaks to me'

In (13a) the clitic has absorbed accusative Case, while in (13b) it has absorbed dative Case. Where the post-verbal position is assigned nominative Case, i.e., where the verb takes a post-verbal subject, as in (14a,c) below, an accusative or dative clitic is impossible, as in (14b,d). This follows from the fact that these clitics require non-nominative Case.

- (14) a. Dorme lui
 [+nom]
 'Sleeps he'
- b. *lo dorme [e]
 [+nom]
 'him-sleeps'
- c. Vado io
 [+nom]
 'Go I'

- d. *Mi vado [e]
 [+nom]
 'Me-go'

In short, a post-verbal subject cannot be cliticized because the clitic would not receive the appropriate Case.⁸ With this in mind, let us return to the cliticization facts in the language of young Italian children.

In early Italian, cliticization of direct and indirect objects is frequent, and appears as early as age 1;11. Some examples follow.

- (15) a. io lo mangio (L 2;3)
 'I it-eat'
 b. a mangio tutta, a mangio tutta pera⁹ (H 1;11)
 '(It) it-eat all, (I) it-eat all (the)
 pear'
 c. li picchio (H 2;3)
 '(I) them-hit'
 d. O metto a te (I 2;1)
 '(I) it-put on you'
 e. Lo voi? [voi = vuoi] (C 1;11)
 '(you) it-want?'
 f. l'ha buttata via a Lila (C 2;1)
 'it-threw away the Lila'
 (=Lila threw it away)

- g. Meo dai? (A 2;0)
 '(you) to me-it-give?'
- h. Ti do questo (D 2;3)
 '(I) to you-give this'
- i. Si, li ho visti io (D 2;3)
 'Yes, them-saw I'
- j. Lo mettiamo su? (E 2;3)
 '(we) it-put up?'
- k. L'ha portata la tata (F 2;4)
 'it-brought the nanny'
 (The nanny brought it)

Although clitics appear frequently in early language, the child never makes the mistake of cliticizing a post-verbal subject with an accusative (or dative) clitic. Thus, ungrammatical sentences like those given in (14b,d) are unattested in early Italian. This gap would be quite curious if the child's early rules made reference to linear order alone, since the post-verbal subject often bears the same linear relation to the verb as a direct or indirect object, i.e., they may all appear immediately following the verb. Rather, the absence of mistakes of this sort supports the hypothesis that principles of Case assignment are operative in the early grammar. We may therefore conclude that the early grammar of Italian, G_{it} , differs from the early grammar of English,

G_1 , with respect to the levels at which Rule R applies. In G_{it} , Rule R may apply in the syntax, thus permitting nominative Case assignment to a post-verbal subject. The two grammars do not, however, differ with regard to the value of the AG/PRO parameter.

2.2 Modals in Early Italian

In Chapter Three we argued that the late emergence of modals in English is, in large measure, an effect of the AG/PRO parameter. Where AG = PRO the modals may not appear under AUX. Moreover, because they lack verbal morphology, they are not analyzed as main verbs. The modals are "filtered out" by the grammar, and emerge only after the shift away from G_1 . In this section we consider the emergence of modals in early Italian.

Recall that in Italian the "modals," potere (can) and dovere (must), are main verbs. In particular, the Italian modals receive the full range of verbal inflection. Like the semi-auxiliaries in English, the Italian modals can be recognized as verbs, and should therefore pose no particular problem for the Italian-speaking child. In the acquisition of English, sentences containing the semi-auxiliaries have to and going to, and the control verb want to are the first complex constructions to be produced (Limber, 1973). Recall that these constructions emerge three to eight months prior to the modals. Thus, if sentences containing potere and dovere are not

problematic for the Italian-speaking children, they should be among the first complex constructions he uses, and thus comparable to the English semi-auxiliaries. In studying the longitudinal records of 15 Italian children from ages 2;0 to 2;9, we found that of the 11 children who produced complex sentences, 8 produced their first modal sentences within 2 months of the onset of complex sentences. For example, Francesco, at age 2;4, produced the following three complex sentences for the first time.

- (16) a. E udata dormire [udata = andata]
'(she) went sleep'
- b. io accio vedere, accio una cosa [accio = faccio]
'I make see, make a thing'
(I show, I make a thing)
- c. Io deo lavorare co cacciavite [deo = devo]
'I have to work with screwdriver'

Thus, for Francesco the modal dovere emerged at precisely the same time as the causative verb fare (make) (in 16b), and the aspectual use of the verb andare (go) (in 16a).

A second child, Claudia, at age 2;0 produced the sentences in (17). Again, these are the first complex sentences in her corpora.

- (17) a. Sta a piangere questo bambino
 'Is to cry this baby'
 (This baby is crying)
- b. Vieni a disegnare qui
 'Come to draw here'
- c. Ce ha fatto vedere la bambola
 'to us-made see the doll'
 (He showed us the doll)

Her first modal appeared at 2;1.

- (18) Non posso più chiamare nonnina
 '(I) can't call grandma any more'

The results of our study are given in the tables in (19) and (20). In (19) we have noted the number of children who used modals at the same time as other complex sentences; within one month of the onset of complex sentences; within two months, etc. In (20) we give the age of each of the 11 children at the onset of complex sentences, and at the first use of modals.

The results given in (19) and (20) (p. 257) show that for the majority of Italian children, potere and dovere emerge at the same time or shortly after the first use of complex sentences. For only three children, potere and dovere are delayed (relative to other complex sentences)

(19) The Emergence of Modals Relative to Other Complex Sentences

No. of children	Same Time	Within 1 month	Within 2 months	>3 months
	<hr/>			
	2	1	5	3

(20) Ages at First Complex Sentence and First Modal

Child	Age at first complex sentences	Age at first modals
<hr/>		
1	2;4	2;4
2	2;0	2;1
3	1;8	1;10
4	2;2	2;7 ¹⁰
5	2;5	2;7
6	2;5	2;7
7	2;1	2;7
8	2;7	2;9
9	2;5	unattested at 2;8
10	2;7	2;9
11	2;0	2;0

for periods greater than three months. In Bellugi's (1967) study of three English-speaking children, the modals appeared in the corpora of one child three months after the onset of complex sentences (i.e., sentences with going to, have to, want to). For the other two children, the modals emerged eight months after the onset of complex sentences.¹¹

In terms of ages, potere and dovere appear some time between 1;10 and 2;9. This is very close to the ages at which Bellugi found the English semi-auxiliaries (Period B)--between 1;11 and 3;0. The English modals, in contrast, appeared between the ages of 2;2 and 3;8 (Bellugi's Period C).

These results indicate that in terms of age, and relative to other complex constructions, the emergence of the Italian "modals" is closer to the English semi-auxiliaries than to the English modals.¹² These are the results we predict given the analysis presented in Chapter Three. The English modals are delayed because they are unanalyzable for the reasons discussed earlier. Similar problems do not exist for the English semi-auxiliaries and the Italian modals which, because of their verbal inflection, are analyzable as main verbs.

Let us conclude this section by noting that early Italian resembles early English both with respect to the possibility of null subjects (which alternate with lexical

subjects), and with respect to the kind of auxiliary elements first produced. By our hypothesis, these are the effects of the initial value of the AG/PRO parameter, in which AG = PRO. For the Italian child the initial value is also the "correct" value, given that in the adult grammar of Italian AG = PRO. Thus G_{it} is "closer" in this respect to the "target" grammar than G_1 , which undergoes a restructuring to AG \neq PRO. Perhaps it is for this reason that in listening to early Italian, one has a strong impression that Italian-speaking children are somehow more "advanced" linguistically than English-speaking children of the same age. Another factor which contributes to this general impression is the pervasiveness of grammatical agreement in early Italian.

In the section that follows, we discuss one form of grammatical agreement--Subject-Verb agreement. We put off discussion of agreement within other syntactic domains, e.g., Noun-Modifier, until Chapter 5.

3. Subject-Verb Agreement

With rare exceptions, the verbs in early Italian are correctly inflected (for person and number) to agree with the subject. The following sentences, which were among the first utterances to contain verbs in the corpora we examined are illustrative. In the sentences in (21)

the subject is lexical; in (22) the subject is null and the referent has been determined from context.

- (21) a. Fai te, fai te¹³ (H 1;11)
[2nd per. sing.]
'Do you, do you'
(you do, you do)
- b. Io pendo peto [peto = questo] (H 2;0)
[1st per. sing.]
'I take this'
- c. Gira il cartoncino (G 2;0)
[3rd per. sing.]
'Turns the box'
(The box turns)
- d. Cosa fa il tore? [tore = registratore] (I 2;1)
[3rd per. sing.]
'What does the tape recorder?'
- e. Io vado fuori (I 1;11)
[1st per. sing.]
'I go out'
- f. Dopo vene mia madre [vene = viene] (L 2;2)
[3rd per. sing.]
'After comes my mother'
- g. Dorme miao dorme (D 2;2)
[3rd per. sing.]
'Sleeps cat sleeps'

- h. Dov'è il latte che ha messo Mariella (M 2;0)
 [3rd. per. sing.]
 'Where is the milk that has put Mariella'
- i. Guarda visto come mangiamo noi (P 2;4)
 [1st per. plu.]
 'Look, seen how eat we'
- j. Perché mi facevano fastidio le mie anelli
 [3rd. per. plu.] (O 2;5)
 (Because my rings bothered me)
- k. Tu leggi il libro (1 1;11)
 [2nd per. sing.]
 'You read the book'
- l. A cola perché i bimbi piangono (C 2;2)
 [3rd. per. plu.]
 'At school why the babies cry'

In the following examples we give the child's utterance in context so that the referent of the null subject is apparent.

- (22) a. Teacher: Simona dove sei?
 [2nd per. sing.]
- Child: Sono giù (L 1;11)
 [1st per. sing.]
 'I am downstairs'
- b. Teacher: Cosa c'è dentro questa scatola?
 [3rd per. sing.]
 'What is there inside this box'

- Child: Le cose che fanno la pizza (L 2;3)
 [3rd. per. plu.]
 'The things that make the pizza'
- c. Child: Piange (H 2;1)
 [3rd per. sing.]
 '(he) cries'
- Teacher: Chi è che piange?
 [3rd. per. sing.]
 'Who is (it) that cries'
- Child: il bimbo
 'the baby'
- d. Teacher: Tu lo bevi il vino? (I 2;1)
 [2nd per. sing.]
 'You it-drink the wine'
- Child: No, bevo acqua [acca = acqua]
 [1st per. sing.]
 No, (I) drink water'
- e. Teacher: I denti cosa fanno?
 [3rd per. plu.]
 'The teeth what do?'
 (What do teeth do?)
- Child: Mordono (I 2;1)
 [3rd per. plu.]
- Teacher: E poi?
 'And then?'
- Child: Mangiano la ciccia
 [3rd per. plu.]
 '(They) eat meat'

verbal inflectional morphemes, -s and -ed, are a fairly late acquisition. Brown (1973), in his study of the acquisition of 14 grammatical morphemes, ranks the 'past regular' (-ed) and the '3rd person regular' (-s) as 9.00 and 9.66, respectively, in order of acquisition. These two morphemes were acquired after the present progressive -ing, the prepositions in and on, the plural marker, the possessive marker, and the articles, etc. The ages of the three children studied by Brown at the point at which they had productive control of these verbal inflections is as follows: 2;6 (Adam), 2;2-2;3 (Kathryn), 3;8-4;0 (Eve).

The late acquisition of the 3rd person regular morpheme is particularly surprising in light of the Italian acquisition facts discussed previously. Why should English-speaking children have a more difficult time with what appears to be a much simpler inflectional system? One obvious answer is that the 3rd person regular morpheme is not the same kind of element as the Italian number and person marker.

In the Appendix to Chapter Two we argued that the 3rd person regular morpheme -s is a defective tense marker, and not a spelling out of AG features. We further proposed that languages vary as to the set of inflectional features which are spelled out on the verb via Rule I, repeated below.

$$(23) F_i + V \rightarrow F_i + V_i$$

In Italian F is instantiated as AG, while in English, it is instantiated as Tense.¹⁴ We assume that the rule in (23) is given a priori. The task of the language learner is to determine how F is instantiated in the particular language to which he is exposed. Once the rule is instantiated in the early grammar, we expect its effects to be quite general. Thus, in the early grammar of Italian, when F is "fixed" at AG, we find the full range of person and number inflection on the verb. Similarly, when F is set as Tense in the early grammar of English, we find both the present tense -s and past tense -ed, which as Brown (1973) observes, become productive at about the same time.

A question which arises is why is the instantiation of F as AG earlier than its instantiation as Tense? One possibility is that the various features, AG, Tense, etc., are hierarchically ordered such that the child first checks the input data to see if AG is realized, then Tense, etc. On this account the English-speaking child, like the Italian-speaking child, will look for the new morphological realizations of AG, but unlike the Italian child, will find this is not a property of his language.

If something along these lines is correct, the absence of the 3rd person regular morpheme in the

earliest stages of English, often construed as evidence that the early linguistic system is semantically-based (Bowerman, 1973), is really a function of the weak inflectional system of English. This is an attractive idea insofar as the alternative, namely, that English-speaking children "lag behind" Italian children in grammatical development is clearly untenable.

3.1 Subject Clitics and Subject-Verb Agreement¹⁵

Although S-V agreement is fully productive in the early grammar of Italian, there are instances in which the agreement process appears to "break down." Specifically, we find that in sentences containing the subject clitics si and ci the verb fails to agree with the post-verbal NP, where this agreement is either obligatory or highly preferred in the adult language. We consider first some sentences containing locational ci. Note that in the following sentences the post-verbal NP is plural, while the verb essere (be) is in the 3rd person singular, i.e.,

e. (ci + è --- c'è)

- (24) a. Due due c'è due topini (D 2;4)
 'There is two mice'
- b. C'è le fragole (A 2;7)
 'There is strawberries'
- c. C'è li uccelli, tutti li ucelli (A 2;8)
 'There is the birds, all the birds'

- d. C'è le api, c'è le api...sono questi
qui (A 2;8)
'There is the bees, there is the bees ...
are these here
- e. Le candele, c'è le candeline (H 2;8)
'The candles, there is the candles'
- f. Qui, qui c'è ancora le pagine (H 2;9)
'Here, here there is more pages'
- g. C'è tanti (E 2;1)
'There is many'
- h. C'è mele (E 2;0)
'There is apples
- i. Guarda c'è galli (B 2;5)
'Look there is roosters'
- j. Sì, è un topino, guarda c'è (B 2;6)
baffi
'Yes, is a mouse, look there is
whiskers'

Before discussing the data in (24)¹⁶ let us briefly review the facts concerning ci in the adult language. In the Appendix to Chapter Two, we described ci as a spelling out of an empty SCL node, analogous to Fiorentino e'. On that analysis, AG is hopped into V in the syntax in order to assign nominative Case to the post-verbal NP. Because of the agreement requirement on Case assignment, AG (in V)

must agree in ϕ features with the post-verbal NP, which are then spelled out on the verb via Rule I. Thus, in the adult language, the examples in (24) are ungrammatical; the verb must be marked plural in agreement with the post-verbal subject, as in (25).

- (25) Ci sono due topini nel buco
'There are two mice in the hole'

What then is happening in the sentences in (24)? More to the point, how is the early grammar, G_{it} , different from the adult grammar in the generation of locational ci sentences? Note first, that the phenomenon illustrated in (24) is entirely general. During the time in which the child produces these "ungrammatical" sentences, there are no instances in which there is agreement with the post-verbal NP in locational ci sentences. That is to say, we do not find examples like that in (25) in the child's corpora. Another point worth noting is that the child is "aware" that the post-verbal NP is plural. This is illustrated by the fact that determiners, quantifiers, adjectives, etc., are marked plural in agreement with the head N. In (24c), for example, we find 'tutti li uccelli' (all the birds), where all and the are [+masculine, +plural]. Similarly, in the sentence in (24d), though essere is singular in the clause containing ci (c'è le api), it is plural in 'sono questi qui' ((they) are these

here), where there is no clitic. In fact, it is quite generally the case that at the same time the child is producing sentences like those in (24) we also find the following.

- (26) a. Sono bone (bone = buone) (E 2;0)
 '(they) are good'
- b. Sono là i bimbi piccoli (A 2;7)
 'Are there the little babies'
 (=The little babies are there)
- c. Sono uccelli (A 2;8)
 '(they) are birds'
- d. E questi qui sono uccelli (A 2;8)
 'And these here are birds'
- e. Queti, queti, sono queti (queti = questi) (D 2;4)
 'These, these are these?'
 (=Is it these?)

It is thus clear that these children know the 3rd person plural form of the verb essere, and that furthermore, in the absence of the clitic, agreement proceeds as with all other verbs. It appears then that it is the subject clitic--in this case ci--which causes a "breakdown" in the agreement process. Given the analysis of subject clitics presented earlier, we may account for the sentences in (24) by assuming that in the early grammar of Italian, SCL

(obligatorily) absorbs the ϕ features in AG. In this respect, the early grammar of Standard Italian is close to the grammar of Trentino and Fiorentino, in which the pronominal subject clitics are a realization of the AG features. In contrast to Trentino and Fiorentino, however, in G_{it} , it is AG and not SCL which triggers the agreement on the verb (via Rule I), and thus, if SCL absorbs the ϕ features in AG, the latter may not be morphologically realized on the verb. Thus, in the examples in (24) the verb bears the 'neutral' 3rd person singular inflection.

Notice, however, that if ci absorbs the features in AG, nominative Case assignment to the post-verbal NP is blocked and the sentences in (24) should be ruled out by the Case Filter. The systematicity of the phenomenon, however, suggests that these sentences are indeed grammatical for the child. Notice in this regard that there is a second construction in Italian (roughly equivalent in meaning to 'c'è NP' in which there is no apparent source of Case for the NP. The expression in question is 'ecco NP,' meaning 'here NP.' Examples are given in (27).

- (27) a. Ecco la ragazza
 'Here the girl'
 (=Here's the girl)
- b. Ecco le ragazze
 'Here the girls'
 (=Here are the girls)

The sentences in (27) are grammatical in adult Italian, and are used by Italian-speaking children. The element ecco is not a verb (nor a preposition), and thus, by standard assumptions, not a Case assigner. We may therefore assume that whatever mechanism allows 'ecco NP' to escape the effects of the Case Filter, also operates in the 'c'e NP' examples in (24).

On the basis of the evidence presented thus far, and in light of the ecco facts, there is an alternative account of the c'è construction, namely, that the c'è is a "fixed expression" for the child and not in fact analyzed as clitic + verb. On this account, 'c'è NP' would be entirely parallel to 'ecco NP.' It is well known that children do sometimes fail to appropriately segment input data. The most commonly cited example is the use of it's by the young English-speaking child, which Brown, Cazden and Bellugi (1973) have argued is not analyzed as 'it + is.' Note, however, that while a 'fixed expression' account of c'è would explain the lack of agreement in the sentences in (24), it would fail to account for a second, strikingly similar, "mistake" in early Italian. We refer to the fact that the agreement process is also blocked in sentences containing the clitic si. Before considering these acquisition data, let us briefly review the si construction in the adult language.

Recall that in the adult language we find both an impersonal and middle use of si as follows.

- (28) a. Si va al cinema spesso in questa città
'One goes to the movies often in this city'
b. Si vedono bene le montagne
'The mountains are seen well'

In the impersonal construction (28a) si absorbs the ϕ features in AG (including nominative Case), and hence the verb is marked in the neutral 3rd person singular; in the middle construction (28b) si absorbs objective Case (Belletti, 1982). AG hops into V where it assigns nominative Case to the post-verbal NP and triggers agreement on the verb. In our discussion of si we noted that in some dialects¹⁷ the impersonal si may occur with transitive verbs, as follows.

- (29) Si vede bene le montagne
'One sees the mountains well'

In other dialects, the presence of the post-verbal NP, for example, le montagne, seems to force a middle construction; that is, the sentence in (28b) is fully grammatical, while that in (29) is highly marginal (??). The children in our study were exposed to one of the latter dialects.¹⁸ Strictly speaking, then, these children would not have heard sentences like that in (29). Nevertheless, such sentences are the only transitive si

(31) Child: Non si vede più gli occhi (= 30a)
[3rd per. sing.]

Adult: Non si vedono più gli occhi
[3rd per. plu.]

In (31) the adult has 'expanded' the child's utterance by inflecting the verb to agree with the plural post-verbal NP.

In the sentences in (30) si absorbs the ϕ features in AG, as does ci in the examples in (24). The verb thus bears the neutral 3rd person singular inflection and the post-verbal NP is assigned non-nominative Case. The construction is in effect a transitive impersonal si construction, though the latter is ungrammatical in the "target" language. It thus appears that the absorption of AG features by SCL is a general process in the early grammar, although it is not clear to us why the grammar "prefers" this analysis. Note that the 'fixed expression' account will not capture the lack of agreement in si sentences, unless we are willing to say that 'si + V,' where V ranges over a broad set of verbs, is also a 'fixed expression,' an analysis which seems rather implausible.

Thus, in the early grammar of Italian ci and si behave analogously; SCL systematically absorbs the ϕ features in AG. This period lasts for varying lengths of time depending on the particular child, though, in general, it ends by age 2;10. After this point, the child's language resembles the adult language, both with respect to ci and si.

- (32) a. Non si rompono i giochi (L 2;5)
 'Not are broken the toys'
- b. Tiri via la coente e poi si spingono (M 2;7)
 (le luci)¹⁹
 'Pull out the electricity and then
 go out (the lights)'
- c. Non si gettano i colori (L 2;5)
 'Not are thrown the crayons'
- d. E vero che non si rompono i giochi (H 2;7)
 '(It) is true that not are broken
 the toys'
- e. Non si mangiano (le albicocche) (M 2;7)
 'Not are eaten (the apricots)'
- f. Ci sono i tattori (tattori = trattori) (E 2;6)
 'There are the tractors'
- g. Ci ciono i bimbi cattivi (ciono = sono) (L 2;5)
 'There are the bad babies'
- h. Ci sono le pappe (pappe = scarpe) (C 2;9)
 'There are the shoes'
- i. Ce ne sono due (G 2;7)
 'There of them-are two'
 (There are two of them)
- j. Ci sono i patumai (I 2;7)
 'There are the garbage collectors'

In the sentences in (32) the verb is inflected for 3rd person plural in agreement with the post-verbal NP. By hypothesis, AG is in V where it triggers the agreement (via Rule I) and assigns nominative Case to the post-verbal subject. At this point, SCL no longer obligatorily absorbs the ϕ features in AG; si is free to absorb objective Case, and ci is, by hypothesis, void of features, as in the adult grammar.

What are the data which could induce the change in the child's grammar? Recall that in Italian, as in English, the morphological effects of Case assignment are seen on pronouns. For example, the nominative form of the 1st person pronoun is io, while the accusative form is me (strong form) or mi (clitic). Recall furthermore, from our discussion at the beginning of this chapter, that the Italian child masters the pronominal system at a very early age. In Italian locational ci constructions, a pronominal NP is marked in the nominative Case.

- (33) a. Ci sono io nella fotografia
'There am I in the photograph'
b. *Ci sono me nella fotografia
'There am me in the photograph'
c. *Ci è me nella fotografia
'There is me in the photograph'

In the sentence in (32a) the post-verbal NP is clearly nominative. Sentences of this form could trigger a shift in the grammar if the child attends to the fact that this nominative NP co-occurs with a subject clitic. He could deduce from such a sentence that SCL does not obligatorily absorb the ϕ features (hence, nominative Case) of AG, since AG must be present in V to assign Case to the post-verbal position. At this point si is free to absorb accusative Case, and we have the 'middle' construction, as in 32a-e);²⁰ ci may be recognized as a spelling out of an empty SCL node, as in the adult system.

One point which we have not yet addressed is why does not this expletive ci, like English expletive it and there, trigger a restructuring of G_{it} such that $AG \neq PRO$; that is, why does not the Italian-speaking child wrongly assume that Italian is not a pro-drop language. As noted in Chapter Three, the crucial difference between the English expletives and ci is that the former are full NPs which occur in [NP,S] position, while the latter is a subject clitic. In locational ci sentences the subject position is phonologically null. We assume, following Burzio (1981) that the position contains a null expletive. Thus, if the child knows that ci is a clitic, and not in [NP,S] position, this element will not induce a resetting of the $AG/\bar{P}RO$ parameter. That ci is indeed analyzed as a clitic in early Italian is evident from the fact that the

negative element non is correctly positioned before ci (in 34a,c,e), while it follows a full lexical NP (in . 34b, d,f).

- (34) a. Non c'è niente (E 2;2)
 'None there is nothing'
- b. io no a rompo (E 2;3)
 'I not it-break'
- c. Adesso non c'è più (H 2;3)
 'Now not there is anymore'
 (=Now there is no more)
- d. Queto qua non va cosi (H 2;3)
 'This one not go like this'
- e. Non c'è più niente dentro (M 2;6)
 'Not there is anymore nothing inside'
 (=There is no longer anything inside)
- f. Quella piccola non fa mica niente (M 2;6)
 'That little (one) not do anything at all'

This concludes our discussion of the early grammar of Italian. Various acquisition data presented in this chapter will be reconsidered in the following chapter when we examine some empirical inadequacies of the semantically-based child grammars.

Notes to Chapter Four

*Most of the Italian child language data presented in this chapter are from an ongoing longitudinal study of the acquisition of Italian, which is being carried on by Massimo Moneglia and Emanuela Cresti and the Collettivo di Educatori dell'Asilo Nido Rampari di San Paolo in the city of Ferrera, Italy.

A total of 22 children were observed and recorded over varying lengths of time. Four of the children were followed for 17 months; 4 for 13 months; 3 for 10 months; and the other 12 for periods ranging from 3 to eight months. Each child was recorded monthly, and the recording sessions lasted from 15 minutes to a half hour. The data presented in this chapter are (with the exception of a few examples) from the corpora of the 11 children studied for 10 months or longer. We were unable to observe any developmental trends in the areas which interest us for those children who were studied for shorter periods of time. The age range was (roughly) from 1;10 to 2;10. Four of the children were taped from age 1;5, but the earliest transcripts (1;5-1;10) contained predominantly one-word utterances, and were, therefore, not relevant to the analyses presented in this chapter. The data from this study are coded with a letter followed by the child's age (e.g., B 1;11).

A more comprehensive review of the data collected in this study is to be published in M. Moneglia & E. Cresti, L'Acquizione dell'Italiano, Il Mulino: Bologna, Italy.

In the analysis of the emergence of Italian modals in Section 2.2, we have included the 4 children studied by F. Antinucci, V. Volterra, & Tieri at the Council of Research (CNR) in Rome. Thus, the analysis of modals is based on the longitudinal records of 15 children. I would again like to thank Massimo Moneglia, Emanuela Cresti, Francesco Antinucci, and Virginia Volterra for making their data available to me.

¹The pervasiveness of morphological agreement in early Italian results in significantly higher MLUs for Italian children than English-speaking children of comparable age (Bates, 1976). We agree with Bates's assertion that "the MLU measure clearly represents very different developments for Italian versus English children" (p. 117). We have not, therefore, used MLU as a basis for comparing English and Italian children.

²In translating the Italian child data, we adopt the following conventions. The translation between apostrophes ' ' is (fairly) literal. Where the literal translation might be unclear to the English-speaking reader, we have included, in parentheses, a non-literal English equivalent. We should note that the Italian data are, by and large, grammatically well-formed, though the English translation may be misleading in this respect. For example, the sentence 'io non vado' would be translated 'I not go.' This sentence is fully grammatical in adult Italian, and not a 'mistake' on the child's part, as is 'I not want' uttered by an English-speaking child. Unless otherwise indicated, the reader may assume that the child's utterance is grammatical in the respects relevant to the discussion.

³We indicate pronunciation errors by giving the correct spelling of the word in parentheses next to the Italian sentence. The most common pronunciation errors are reduction of consonant and vowel clusters.

⁴The symbol \emptyset is used to indicate that the sentence is unattested in the acquisition data.

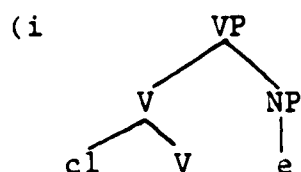
⁵Gruber (1967) argues that sentences in which the subject pronoun is in the accusative Case are instances of topicalization. On his analysis, the sentence in (8) has the following structure.

(k) [Me [\emptyset like coffee]
 TOP S

Although Gruber's analysis is extremely interesting, there is little evidence that the child is in fact producing a topicalized structure in these cases. In particular, the sentences lack the intonation break which is typically found in topicalization.

⁶The lack of such errors has also been noted by Gruber (1967) and Klima (personal communication to Gruber).

⁷Following Strozer (1976), Rivas (1977), and Jaeggli (1980), we assume that object clitics are base-generated in pre-verbal position in a structure of the following sort.



The identity of the null element in [NP,VP] position is irrelevant to our present discussion. The term 'cliticization' as used in the text is not meant to imply a movement analysis of the clitic from post-verbal to pre-verbal position, as proposed, for example, in Kayne (1975).

⁸Subjects of 'ergative verbs' (in the sense of Burzio (1981)) may be cliticized by the partitive clitic ne. This is irrelevant to our present discussion, however.

⁹We assume that a pre-verbal o or a are mispronounced versions of the direct object clitics lo and la.

¹⁰Transcripts of this child at 2;5 and 2;6 are unavailable, and it is therefore possible that the modals emerged earlier than 2;7.

¹¹This is the span between Bellugi's (1967) Periods B and C.

¹²We did not use MLU in comparing the emergence of modals in Italian and English for the reasons noted in Note 1. We should point out, however, that MLU does not appear to be a very good predictor of this grammatical development even within Italian. At age 2;0 Francesco had an MLU of 3;95 (MLU was not calculated beyond this point); the modals emerged at age 2;4. Claudia's MLU at the time the modals appeared was 2;68 (age 2;0). The MLUs for these two children are reported in Bates (1976).

¹³The subject pronoun te in (21a) is the accusative form of the 2nd person pronoun you. This is acceptable usage in many regions of Italy, and hence not a "mistake" on the child's part.

¹⁴In the Appendix to Chapter Two, we noted that the inflectional ending on Italian verbs is a realization of both AG and Tense features in the adult grammar. In early Italian, however, there is no evidence to suggest that the inflection is anything other than the AG features alone. Italian-speaking children, like English-speaking children, acquire tense distinctions much later than the period we are considering (Antinucci & Miller, 1976). We have evidence of the instantiation of F as AG + Tense when we find productive use of past tense inflection in the language of Italian children (around age 3;0).

In the data we have presented we find an occasional example of the (perfect) past, e.g., ha mangiato (has eaten). Note that in this tense, the verb (auxiliary) is inflected for present tense, as in English, and hence, by our analysis, contains only AG features in the early Italian grammar. Moreover, Antinucci & Miller argue that this early use of the perfect marks aspect ("the end stage of a process or action") as opposed to past tense. We will assume that this is correct. Thus, in early Italian, the perfect past is neither morphologically nor semantically a past tense.

¹⁵I am indebted to Tom Maxfield for his help with the analysis presented in this section.

¹⁶We have considered the possibility that the sentences in (24) result from some sort of dialectal interference since the dialect spoken in this area (Ferrarese) does use the singular form of the verb in the analogous construction, given in (i).

- (i) A gh'è tant ad chil person
'There is many people'

There are, however, many reasons for rejecting an interference account. First, these children do not speak the dialect, which is largely incomprehensible to a speaker of Standard Italian. There is always the possibility that the children have been exposed to the dialect though they themselves do not speak it. However, in the transcripts and tapes we examined, there is no trace of the dialect. Thus, if 'c'è + plural NP' is an effect of Ferrarese, it is the only one which exists in the children's language, a situation which seems rather implausible.

One other fact worth noting is that in Ferrarese there is no 3rd person plural form of the verb essere; that is to say, it is homophonous with the 3rd person singular, as in (ii).

- (ii) Chi ragazzitti i'è bien
'Those boys SCL-is good'

We expect that if 'c'è + plural NP' is a dialect effect the children should not be producing sentences like those in (26), in which essere is inflected for plural agreement.

Finally, the c'è construction ends rather abruptly (at around age 2;10). If it is a result of dialectal interference we might expect it would continue much longer, perhaps until the children begin to attend school.

I am grateful to Enrico Paradisi for informing me of the facts in Ferrarese.

¹⁷We use the term "dialect" in this context to refer to regional varieties of Standard Italian, and not to the "real" dialects like Trentino, Fiorentino, and Ferrarese, which are substantially different from Standard Italian.

¹⁸It is possible that the sentences in (30e,f) are reflexive rather than impersonal. (si is also the 3rd person singular and plural reflexive clitic.) On a reflexive interpretation, the sentence in (30e), for example, is translated as 'he (she) himself-puts on the shoes' (=he/she puts his shoes on). As a reflexive, the agreement on the verb in (30e,f) is correct. The other examples in (30) are unambiguously impersonal.

¹⁹Where the NP is in parentheses, it was not verbally expressed by the child, but inferred from context.

²⁰The fact that Italian-speaking children have control of the middle construction at this early age (2;10) raises the question of why the copular passive is such a late acquisition in Italian and English. In general, the copular passive does not become productive before age 4 or 5. Recall that the passive and middle constructions involve the same two basic syntactic operations (Belletti, 1982).

- (i) absorption of subject Θ -role
- (ii) absorption of accusative Case

The early acquisition of the middle suggests that the child controls these operations. It may therefore be the case that the copular passive is delayed for purely morphological reasons. That is to say that the child must learn that passive morphology (be + EN or essere + passive participle) behaves like si in absorbing Θ -role and Case.

CHAPTER FIVE

SEMANTICALLY-BASED CHILD GRAMMARS: SOME EMPIRICAL INADEQUACIES

In Chapter One we discussed a serious conceptual problem engendered by semantically-based descriptions of early language (Schlesinger, 1971; Bowerman, 1973; Braine, 1976), namely, the problem of determining an algorithm which would map the early system onto an adult grammar. We further suggested that the complexity of such an algorithm (should one be devised) would effectively undermine all the "simplicity" arguments which are typically used to justify such descriptions. In short, semantically-based grammars do not contribute towards an explanation of linguistic development. In this section we consider several empirical problems with the semantically-based systems. We will show that these grammars simply fail to capture simple distributional regularities and other salient properties of the data they purport to describe, in particular, grammatical agreement.

On a semantically-based model, the child's early grammatical knowledge is characterized as a direct mapping from semantic categories, for example, agent, action, object acted upon (patient), etc., onto a surface

expression. The rules of the grammar specify the linear order of the semantic categories relative to one another in a particular language. Thus, in English, for example, agent is ordered before action, action before patient, and so on. Although the various proposals for semantically-based grammars differ in detail, they share the basic assumption that early language may be adequately described by a system which does not make reference to syntactic categories and relations, e.g., N, V, VP, Subject, etc., nor to the constituent structure which they entail, hence a system which is fundamentally different from an adult grammar.

In the previous chapter we discussed various properties of early Italian and early English. We observed, for example, that pronouns are correctly marked for nominative or accusative Case, depending on their particular syntactic function, subject or object.¹ Moreover, Case-marking in early Italian is correct regardless of the linear position of the Subject, i.e., the subject may be pre-verbal or post-verbal. We also observed that in early Italian the verb is inflected to agree in number and person with the subject.² Again, the linear position of the subject is irrelevant.

Within a semantically-based model, the grammatical relations Subject and Object are undefined. Rather there is a set of formulas which describe various semantic

relations, for example, agent - action (Mommy eat), experiencer - experience (Daddy see), theme - action (Mail come), entity attribute (Ball red), and so on. Thus, a semantically-based grammar makes the empirical prediction that the rules of grammar refer to the above categories rather than, say, Subject NP, Verb, etc. On this model, we do not expect the rule responsible for nominative Case assignment to apply across semantic categories like agent, experiencer, theme, etc., since these do not form a unified class. Similarly, we do not expect to find verbal inflection on both elements which express action and experience for the same reason. A semantically-based system would receive empirical support if, for example, S-V agreement was found in the agent - action pair, but not, let us say, in the experiencer - experience pair, or, alternatively, if pronominal agents, but not themes and entities were corrected correctly Case marked. There is, however, no evidence that these rules are semantically restricted in Italian (or English).³ Quite the contrary is true. The rules of Case assignment and verbal inflection apply across the various semantic types, affecting elements which have been traditionally referred to as Subject, Object, and Main Verb.

In discussing grammatical agreement, we have thus far limited ourselves to Subject-Verb agreement. In Italian we also find agreement inflection on articles, demonstrative and possessive pronouns, adjectives, and quantifiers.

These elements agree in number and gender with the head Noun. From the point at which Italian-speaking children begin concatenating words, their language respects this agreement pattern. Following are examples. (We underline the head Noun and the inflectional element on the articles, adjectives, etc.)

- (1) a. Chelo micino, no è picino, no è bello (L 1;11)
 [mas. sing.]
 'That kitten, no is little, no is beautiful'
- b. Sono i piesci (piesci = peschi) (L 1;11)
 [mas. plu.]
 'Are the fish'
- c. E mia gonna (H 1;10)
 [fem. sing.]
 'Is my skirt'
- d. Dove bimbo, questo mio bimbo (H 2;0)
 [mas. sing.]
 'Where baby, this my baby'
- e. Sono bone (le mele) (bone = buone) (E 2;1)
 [fem. plu.]
 'Are good (the apples)'
- f. Un ata mela (ata = altra) (E 2;1)
 [fem. sing.]
 'Another apple'
- g. Un ato albeo (ato = altro, albeo = (G 2;2)
 [mas. sing.] albero)
 'Another tree'

- h. E una macchina (G 2;2)
 [fem. sing.]
 'Is a car'
- i. E un cane (G 2;2)
 [mas. sing.]
 'Is a dog'
- j. un'altra mucca c'e (G 2;2)
 [fem. sing.]
 'Another cow, there is'
- k. Questo è il cauciù (G 2;2)
 [mas. sing.]
 'This is the gum'
- l. Questa è una macchina (G 2;2)
 [fem. sing.]
 'This is a car'
- m. Guarda la mela piccolina (D 2;4)
 [fem. sing.]
 'Look at the apple little (=little apple)
- n. Guarda questi gialli (D 2;4)
 [mas. plu.]
 'Look at these yellows (=yellow ones)
- o. Guarda il topino piccolino (D 2;4)
 [mas. sing.]
 'Look (at) the mouse little' (=little mouse)
- p. La mucca, è la mucca azzurra (azulla = (D 2;4)
 [fem. sing.] azzurro)
- 'The cow, is the cow blue' (=blue cow)
- q. Questa è una stella (D 2;4)
 [fem. sing.]
 'This is a star'

As with Subject-Verb agreement, 'Noun-Modifier' agreement is not restricted to particular semantic relations. The head Noun agrees with the modifier whether the two elements stand in a relation of attribution (e.g., la mela piccolina--'the apple red') or possession (mia gonna--'my skirt'). Thus, again, the semantically-based models receive no empirical support. The domain of agreement in most of the above sentences is NP, e.g. [Det. N. adj.].⁴
 NP
 It is difficult to see how a system in which these grammatical notions do not receive expression can capture these agreement facts.⁵

Although Noun-Modifier agreement is a limited phenomenon in English, there is some evidence that in early English the domain of agreement is identified as NP. Cazden (1968) has observed that the percentage of correct agreement inflection (for plurality) is significantly higher in NPs (what she calls 'simple plurals'), for example, two blocks, some blocks, than in 'predicate nominatives,' where the domain of agreement is larger than a single NP, for example, They blocks. The percentages of correct agreement are reported below.

(2)	<u>Child</u>	<u>Simple Plural</u>	<u>Predicate Nominative</u>
	Sarah	.83	.54
	Adam	.77	.43
	Eve	.89	.30

(From Cazden, 1968)

As Brown notes (1973), "there is no semantic difference between the simple and complex predicate" (p. 374). Although we have no satisfactory account of the differential results in agreement in early English, it seems clear that even an adequate statement of the facts requires reference to the category NP.

Let us now turn to some distributional properties of early Italian. Recall that in Italian direct (and indirect) objects may be cliticized. When an object is a lexical NP, it appears in post-verbal position, as in (3a). When the object is a clitic, it immediately precedes the verb, as in (3b).

- (3) a. Io vedo $\left. \begin{array}{l} \text{loro} \\ \text{i ragazzi} \end{array} \right\}$
 'I see $\left. \begin{array}{l} \text{them} \\ \text{the boys} \end{array} \right\}$
- b. Io li vedo
 'I them-see'

The semantic role of i ragazzi or loro in (3a) is precisely the same as that of the clitic li in (3b). Let us call it theme. As we noted in Chapter Four, object cliticization is frequent in early Italian, appearing at around age 1;11.⁶ If the child's early grammatical system is a direct mapping of semantic roles onto a linear position we expect that clitic and full lexical objects will bear the same linear relation to the verb in the child's language. Either the

theme will follow the verb, or it will precede the verb, irrespective of its grammatical category, i.e., clitic or NP. We thus expect to find clitics in post-verbal position or full lexical object NPs in pre-verbal position. In short, we expect semantically-conditioned errors. As we noted earlier, however, clitics (and lexical objects) are correctly positioned with respect to the verb.⁷ Errors of the following sort are unattested.

- (4) cIo vedo lo
 (clitic)
 'I see it'

Similarly, the order of lexical objects in Italian is direct object-indirect object, as in (5a), while the order of (multiple) object clitics is indirect object clitic-direct object clitic, as in (5b).

- (5) a. Tu hai dato il libro a me
 'You have given the book to me'
 b. Tu melo hai dato
 'You to me-it-have given'

Again, the semantic role of the direct and indirect object is the same whether it is syntactically realized as a clitic or full NP. We expect some sort of error in the

distribution of these elements in early Italian if the grammar makes reference only to semantic roles. No such errors are attested.⁸

Finally, as we noted in Chapter Three, the null subject phenomenon in early language (English and Italian) is not semantically restricted. We find null subjects with verbs that select an agent argument, for example, eat; with verbs that select a theme, for example, fall; and with verbs that select experiencer, for example, see, want, etc. Once again, these are not the results we expect to obtain from a semantically-based system. It seems fair to say that all of the available evidence argues against the hypothesis that the early grammatical system is semantically-based. In each instance the empirical predictions which follow from these theories are not borne out by the acquisition data.

Thus far we have limited our attention to naturalistic acquisition data, i.e., spontaneous speech production. Let us now briefly consider an experimental study which purports to test the hypothesis that the early grammar is semantically-based. The two experiments, reported in Marantz (1982), run as follows. A group of English-speaking children (ages 3 to 5) were taught to use novel (made up) verbs to describe various scenes. The verbs were of two types. The first type, which we refer to as Type I verbs, selects an agent subject and a patient

object, for example, the verb moak, meaning "to pound with an elbow.' Thus, the sentence 'Larry is moaking the book' means 'Larry is pounding the book with his elbow.' As Marantz (1981) notes, in English if one of the semantic roles associated with a verb is an agent, then this role is expressed by the logical subject of the verb. In this respect then, the Type I verbs are "possible" English verbs. The Type II verbs, in contrast, select a patient subject and an agent object, for example, the verb pume. The sentence 'the book is puming Larry' means 'Larry is lifting a book up and down on his knees.' The Type II verbs are impossible in English (and, we should add, in most of the world's languages).⁹ Marantz hypothesized that "if a child maps directly from general semantic relations to their surface expressions, he should have trouble learning a verb whose semantic relation-surface structure position correspondences violate his mapping rules" (p. 45). For example, if his mapping rule says 'agent first,' then he should have trouble learning the Type II verbs. Marantz further assumes that "if, on the other hand, the child does not employ semantic classes in his rules, i.e., . . . if he maps from general semantic relations to some intermediate level (grammatical relations) and from this level to structural positions, then he should be able to learn all the verbs in the experiment with comparable ease" (p. 45).

The results of the experiment indicate that the 3 and 4 year olds had more difficulty in learning Type II verbs than they did Type I verbs. The 5 year olds, in contrast, seemed to learn both types with (roughly) equal facility. (The age factor was not significant in the first experiment, however.) Additionally, Marantz found that the younger children frequently reversed the arguments of the Type II verbs, converting them, as it were, into Type I verbs. Marantz interprets these results as supporting the hypothesis that the early linguistic system (up to age 4) is semantically-based. He further concludes that "at around age 5 the children's knowledge of language undergoes a major restructuring such that they begin to exploit grammatical relations to mediate the connection between semantic relations and their structural expression" (p. 33).

Unfortunately, the results of the experiments are not entirely straightforward. Marantz's hypothesis rests crucially on the assumption that if the grammar is not semantically-based, then the Type II verbs do not violate any rule of the grammar of English and should therefore be unproblematic for the child. This assumption is clearly false, as Marantz well knows, since it is a rule of English that if a verb selects an agent argument, then this argument is realized as the subject. It is simply unclear to us how Marantz has determined on the basis of

these experiments that the Type II verbs are difficult because they violate an alleged rule 'agent first,' as opposed to a rule which maps the role agent onto a syntactic subject. The experimental results might just as easily be interpreted as supporting the hypothesis that by age 3, English-speaking children know enough about the mapping relation between semantic roles and grammatical relations that they "reject" the Type II verbs.¹⁰ That the 5 year olds nevertheless were able to use these verbs in an experimental setting simply suggests that they have certain task-oriented skills which the younger children lack.¹¹ In short, the experiments have no bearing whatsoever on the hypothesis they were designed to test, namely, that the early grammar is semantically-based.

Let us conclude this chapter by noting that Brown (1973), in a cross-linguistic survey of several acquisition studies, found that early utterances tend to express the same set of (8-12) semantic relations. These include agent-action, entity-attribute, entity-location, possessor-possession, etc. The results of this survey clearly indicate that all young children tend to talk about the same kinds of things. A very different interpretation of Brown's findings is that the early grammar maps these relations directly onto a surface string, i.e., that the early grammar is semantically-based. As we have shown in this chapter, this second interpretation is without empirical support.

Notes to Chapter Five

¹More precisely, Case is assigned to a particular structural position [NP,S], [NP, VP], etc., under government by a Case assigning element, V, AG, etc.

²Where "subject" is the NP which is assigned Nominative Case.

³Gvozdev (1961) reports that in the corpora of one Russian-speaking child the direct objects of action verbs and verbs of transfer and relocation (e.g., carry, give, put, throw) were marked in the accusative Case, while the direct object of verbs like read, draw, make were not so marked. Bowerman (1973) suggests that in this instance Case-marking may be restricted by semantic considerations. Gvozdev's finding is reported in Bowerman (1973). Unfortunately, we do not know enough about Russian or the relevant child data to evaluate the proposal.

⁴We also find agreement in predicate nominatives, for example, in the sentences in (l-k,l,q) the demonstrative pronoun agrees with the element in object position. This is correct in the adult language. As we will note shortly, English-speaking children are significantly less consistent in using agreement in predicate nominatives than in simple NPs (Cazden, 1968). We have no explanation for this difference between early English and early Italian.

We should also note that in early English predicate nominatives, the copula is missing, while in early Italian it is most often present. The prior appearance of essere relative to "contractible" be is due to the fact that the former is analyzed by the child as a main verb, while the contraction of English be forces an analysis in which be is in AUX, an analysis which is impossible prior to the shift away from G_1 . See Chapter Three for discussion.

⁵Valian (1981) provides distributional evidence that English-speaking children between the ages of 2;0 and 2;5 do "know" the internal structure of the category NP. On the basis of this evidence, Valian argues, as we have, that language development "takes place in parallel on all fronts." She states, "there is no reason to assume a serial model in which syntax is learned last. Not only is there no conceptual basis for such an assumption, but the data presented here show that there is no factual basis for it" (p. 48).

⁶See Chapter Four, Section 2.1 for example sentences containing clitics.

⁷The lack of errors in the position of clitics has also been observed by Bates (1976) in her study of the pragmatics of word order in early Italian.

⁸I am indebted to Sharon Klein for the observation concerning multiple clitics.

⁹It is argued in Marantz (1981) that there are two languages which permit verbs with this argument structure, Dyirbal and Central Arctic Eskimo. Marantz refers to the latter as "true ergative languages."

¹⁰We should note, in addition, that there are several flaws in the experimental design which cast serious doubt on the reliability of the results obtained. For example, Marantz did not control to determine whether or not the subjects knew the words for the various animals and objects used in the scenes he presented to teach the novel verbs. Judging from Marantz's description of the procedure, it appears that some of the children were not in fact familiar with the non-novel words. Marantz reports "the experimenter named the animals in the picture if the child could not or would not . . ." (p. 54) (emphasis mine) Thus, the ease with which the children uttered a sentence to describe a particular scene could easily have been a function of their familiarity with the non-novel words needed to complete the task.

Moreover, given the nature of the interaction between the experimenter and the child (which consisted of prompting and coaxing until the child uttered a correct response or the scenes for a particular verb ran out), and the relaxed criteria for "correct response" (the child had to utter a sentence containing a subject, object, and "something resembling the verb to be learned, but not recognizably a verb of English or one of the other experimental verbs the child had already been exposed to" (p.55)), there is simply too great a chance for the experimenter to unwittingly bias the results.

Finally, Marantz did not control to determine whether the children who reversed the order of arguments of the Type II verbs would have inverted the order of arguments of a familiar English verb. It is well-known that young children reverse word-order in experimental tasks with verbs that they use correctly in spontaneous

production (Turner & Rommetveit, 1967). The results of the experiments would have been more reliable if he had tested the youngest children with non-novel English verbs in reversible sentences, for example, 'the dog chased the cat.'

¹¹In his summary, Marantz addresses the issue of whether the older children were simply responding to the demands of the task, i.e., playing a game which is "divorced from the workings of language." He argues that this cannot be the case since "if the 5-year olds were playing a game, we would expect them to have improved over time as they figured out what the rules of the game were." Marantz notes that the average score for the 5-year olds over all the experimental verbs was 1.95 (scene presentations), while their average score on the first verb in a testing sequence was 1.65. Hence, their performance worsened as the testing advanced. What Marantz neglects to point out, however, is that the testing sequence consisted of 4 novel verbs, each of which had a different argument structure. Each child was presented with one exemplar of each of the following verb types: Agent-Patient (Type I), Patient-Agent (Type II), Agent-Location, Location-Agent. Leaving aside the question of the validity of the results obtained with only a single token of each verb type, it is unclear how the children could "learn the rules of the game," when the rules changed throughout the testing sequence. Thus, the results are not, in fact, inconsistent with the hypothesis that the older children were playing a game, or relying on skills which do not reflect their knowledge of English.

CHAPTER SIX

SUMMARY AND CONCLUDING REMARKS

In this final chapter we would like to briefly review what we consider to be the main empirical results of this study. Additionally, we wish to consider certain substantive issues which arise within the particular approach to grammatical development we have adopted, in particular, the relationship between grammatical development and the theory of markedness.

1.0 Summary

In the previous chapters we have attempted to explain various aspects of syntactic development in young children with the framework of a parameterized theory of grammar, the Government-Binding Theory (cf. Chomsky, 1981). Within such a theory, syntactic development is a process by which the child "fixes" each of the parameters of UG at the value which is correct for the language he is acquiring. Various material in the input data act as "triggering data" which induce particular parameter settings. The choice of one or another of the values along a single parameter may have complex and varying effects throughout the grammar, giving rise to languages which appear to be quite diverse.

Viewed from the perspective of acquisition, a parameterized theory of grammar raises the empirical possibility that during the course of grammatical development the early grammar of a language L may differ from the adult grammar of L with respect to the value specified for a particular parameter. Such a "missetting" in the early grammar will result in a language which varies in systematic ways from the adult language. In this thesis we have argued that many well-known properties of child language can be explained as effects of particular parameter settings in the early grammars. Implicit in this hypothesis is the claim that while the early grammar may differ from the adult grammar, the variation between the two systems falls within well-defined limits, as determined by the principles and parameters of UG.

The parameter which we examine in most detail is a version of the 'pro-drop parameter,' which we reformulate as the AG/PRO parameter. This parameter accounts for the possibility of having phonologically null subjects in tensed clauses, a possibility which is realized in languages like Italian and Spanish (the so-called 'pro-drop' languages). We argue that in these languages, AG (the set of features for person, number, gender, which appears under the INFL node) is to be identified with the element PRO. Where AG is PRO, it licenses a phonologically null subject (pro), as in Italian and Spanish;

where AG is not PRO, null subjects are impossible, as in English and German, for example. There are further effects of the AG/PRO parameter, some of which are specifically related to the auxiliary system, which differs in crucial respects in pro-drop and non-pro-drop languages. In Chapter Two we examined the effects of this parameter in the adult grammars of English and Italian. The grammars of these two languages represent paradigm cases of each of the two possible values along the AG/PRO parameter. The analysis presented in Chapter Two provides the framework within which to investigate child language.

In Chapter Three we argued that the grammar of young children acquiring English differs from the adult grammar of this language in its value for the AG/PRO parameter. Specifically, we argued that in the early grammar of English, AG is identified with PRO (as in the adult grammars of pro-drop languages). This hypothesis allowed us to explain various salient properties of early English, for example, 'subjectless' sentences, that is, sentences without overt lexical subjects, which are nevertheless interpreted as containing a definite pronominal subject. Moreover, the analysis provides an explanation for the delayed emergence of the modals and the "contractible" be (Brown, 1973) relative to main verbs, the "uncontractible" be, the elements can't and

don't, and the semi-auxiliaries hafta and gonna. The fact that the semi-auxiliaries emerge significantly earlier than their semantically equivalent modals is of particular interest insofar as it argues strongly against any analysis which invokes semantic or conceptual complexity as the cause of the late acquisition of the modals. Finally, we suggested that the AG/PRO parameter, coupled with a particular pragmatic principle--The Avoid Pronoun Principle (Chomsky, 1981)--accounts for the absence of the lexical expletives it and there in the early stages of acquisition. The AG/PRO hypothesis provides a unified account of the above phenomena and an explanation for their co-occurrence in real time.

The properties of early English which we examined occur very early in the acquisition process, beginning prior to age 2 and continuing until some point in the third year (the precise duration varies from child to child). We therefore suggested that the pronominal AG constitutes the "initial" value along the AG/PRO parameter, where by "initial" value we mean the value specified in advance of linguistic experience with a particular language. This hypothesis makes a precise empirical prediction, namely, that the early language of children acquiring languages other than English will also exhibit the effects of a pronominal AG, whether or not this is the appropriate setting in the adult grammar.

We thus briefly examined early German and, in somewhat more detail, the language of young children acquiring Italian. As expected, 'subjectless' sentences are a general property of early language, thus supporting our hypothesis concerning the initial state. Moreover, we found that the incorrect SOV word-order (in main clauses) attested in the early language of German children is a language particular effect of a pronominal AG. That is to say that a language particular instantiation of 'Move α ' (verb raising) is blocked in the early grammar of German.

One interesting and important difference in the development of English (and German) on the one hand, and Italian, on the other, is that the early grammar of English must undergo a "restructuring" or "resetting" of the AG/PRO parameter insofar as the initial value for the parameter is not the correct value for the adult grammar. Thus, in our discussion of the early grammar of English, we also examined the kinds of input data which could "trigger" a resetting, and the effects of the resetting, among which are the child's consistent use of lexical subjects and the emergence of the modals and "contractible" be.

In Chapter Four we compared the early grammar of English and Italian. Although the two grammars are identical with respect to the value specified for the

AG/PRO parameter, they differ along two other parameters. The first--which we have called Rule I--is a morphological rule which determines the range of features which may be morphologically realized on the verb; the second--Rule R--expresses the variation with respect to the level of grammar at which the INFL(ectional features) affix onto the verb (Chomsky, 1981). With regard to these rules, we find that the early grammar is fixed relatively early, and hence, that early Italian, like the adult language, exhibits freedom of surface word-order (pre-verbal and post-verbal subjects) and a rich system of morphological agreement.

Let us diverge briefly to consider the implications of these findings. That early Italian--in contrast to early English--exhibits the above properties is not a particularly startling fact, given that adult Italian and English differ in precisely these respects. That is to say, the Italian child receives evidence of post-verbal subjects and grammatical agreement while the English-speaking child does not. The differences between the two early systems are interesting, however, insofar as they vitiate the widely shared misconception that grammatical development proceeds from semantics to syntax, the rationale behind this proposal being that semantics is universal, while syntax is language particular (yet another misconception), and thus if

different child languages are similar in shape, it is the semantics at work. In its most modern incarnation, the 'semantics to syntax' idea takes the form of a semantically-based grammar, which we have already discussed in some detail. In an earlier form, this idea manifested itself as the claim that 'children talk in base strings directly' (McNeil, 1966), since, within a Standard theory framework, semantic interpretation maps onto deep structure. The differences between early Italian and early English suggest, quite in contrast to the above view, that the young child knows a considerable amount about the particular language he is acquiring, and hence, that development is not a progression from semantics to syntax (or alternatively, from deep structure to surface structure). Rather, as suggested by Valian (1981), "development proceeds in parallel on all fronts" (p. 48).

As we noted in Chapter Four, the Italian acquisition data, in particular, the agreement facts, are interesting in a second respect. They strongly suggest that the absence of the 3rd person singular morpheme -s in the earliest stages of English should not be construed as evidence of a semantically-based grammar (Bowerman, 1973). Rather, we argued that -s is a later acquisition because it is a Tense marker and not a realization of AG, as is inflection in Italian. Note that if one

takes the absence of inflection in early English as evidence of a semantically-based system, one is forced to conclude that the early grammar of English differs from the early grammar of Italian in that the former, but not the latter, is semantically-based. But then we have effectively undermined the 'semantics to syntax' argument, which rest crucially on the universality of the semantic system. Moreover, we are forced to the untenable conclusion that English-speaking children somehow "lag behind" Italian children in development.

Central to this thesis is the hypothesis that child grammars, like adult grammars, are constrained by the principles and parameters of UG. This amounts to the claim that grammatical development is in a "continuous" process, and that the differences which exist between the early grammar and the adult grammar (and, we should add, between the early grammars of different languages) fall within narrowly defined limits. The alternative view, implied by the semantically-based models, is that grammatical development is a strongly "discontinuous" process in which the child grammars are organized along principles which are fundamentally different than those which determine the form of adult grammars. In this study we have argued that the semantically-based models are based on a set of preconceived and inexplicitly formulated notions about what

is 'simplest' for the child. Moreover, they are without empirical support, as we showed in Chapter Five. Thus, insofar as there is no evidence that the early grammar is semantically-based, there is no support for discontinuous theories of development, for example, the 'metaphoric' (or 'tadpole to frog') hypothesis advanced in Gleitman (1981) and Gleitman and Wanner (1982).

Let us now turn to some other general issues which arise within a parameterized theory of grammatical development.

2.0 The Initial State

A central question which arises in the study of grammatical development is whether the interaction of the principles of UG and the input data is in fact sufficient to determine the particular intermediate grammars, or is there some further structure to UG which in some sense "guides" the developmental process. Couched in somewhat different terms, the question is are the parameters of UG "open" at the initial state, waiting for the relevant data which will determine their value for a particular language, or is there an "initial" value which is assumed a priori and which may be later altered on the basis of linguistic evidence? If the analyses proposed in this study are correct, it would

appear that the latter is the case; that is to say that at least some of the parameters come "preset."

With regard to the AG/PRO parameter, we have argued that at the initial state, AG=PRO. In the developing grammars of English (and German) this parameter must be reset, while in the grammar of Italian, it remains invariant. Similarly, we suggested that the very early appearance of agreement inflection in the language of Italian-speaking children results from the fact that the first instantiation of the features in Rule I are the AG features, while Tense is a later instantiation. It matter little whether we think of the AG instantiation as the "initial" value or simply the "first" value chosen. In either case, there is a preferential ordering within the set of possible values. Thus, with respect to the AG/PRO parameter and Rule I we have rather direct evidence (from child language) of an initial setting.

With respect to Rule R, there is also evidence of an initial setting, though the evidence is of a more indirect sort. In Chapter Four we noted that the earliest three word utterances of Italian-speaking children contain both pre-verbal and post-verbal subjects. We inferred from this fact that Rule R in the early grammar of Italian applies in both the syntax and the phonology. In early English, in contrast, we find only pre-verbal subjects, i.e., Rule R applies only in the phonology. We observed, however, that the Italian child,

unlike the English-speaking child, will receive "positive" evidence that Rule R applies in the syntax in his language; he will hear post-verbal subjects in the input data. In English, no such evidence is forthcoming. It is thus fair to assume that at the initial state Rule R is specified as applying only in the phonology. The Italian-speaking child must at some point alter this analysis to include the application of Rule R in the syntax.

The question which is left unanswered on this account is why is it not the case that there is an initial stage in which Italian-speaking children produce only sentences with pre-verbal subjects, followed by a second stage in which they use both pre-verbal and post-verbal subjects. The shift from the first stage to the second would correspond to the point at which the Italian child reset the parameter so as to allow Rule R to also apply in the syntax.

The Italian children whose language we examined ranged (roughly) from 2 to 3 years of age. Prior to age 2 the overwhelming majority of utterances produced by Italian children do not contain lexical subjects (Bates, 1976). It is thus possible that there is in fact an early stage in which Rule R applies only in the phonology, but the effects of this setting, i.e., pre-verbal lexical subject only, are obscured by the effects

of the AG/PRO parameter. If this is the case, then direct evidence bearing on the initial setting for a particular parameter may not always be available from child language, and considerations of the availability of positive data become crucial.¹

3.0 Grammatical Development and the Theory of Markedness²

Our discussion of initial parameter settings raises another question, namely, does the initial value along a particular parameter constitute the 'unmarked case,' or more generally, what is the relationship between grammatical development and the theory of markedness.

As typically conceived, the theory of markedness is a function which maps linguistic data onto a particular grammar. That is to say, the theory specifies the 'least marked' or 'most highly valued' grammar consistent with the data of a particular language. Thus, from the perspective of the final state achieved, i.e., the adult grammar, the relationship between acquisition and the theory of markedness is quite straightforward; the child constructs the 'least marked' or 'most highly valued' grammar consistent with the data that are available to him.

Unfortunately, we find that the relationship between the intermediate (or initial) grammars and the

theory of markedness is less clear, although there are specific proposals within linguistic theory to define markedness in terms of an "idealized" developmental sequence.³

One such proposal, put forth in Rouveret and Vernaud (1980), is that the relative markedness of particular (adult) grammars can be defined as a function of the length of the sequence of successive child grammars which lead to the final grammar. They state,

The complexity of the grammar G_L in terms of markedness can be equated with the number of changes which have been made in the set of rules G_0 [the initial grammar] to get the descriptively adequate grammar for L [a language], G_L , i.e., with the length of the sequence G_0, \dots, G_L . (p. 195)

Rouveret and Vernaud note that "by this definition G_i is less marked than G_{i+1} , even if the two grammars differ by the addition to G_i of some mechanism from core grammar," where core grammar is "the stock of hypotheses of null cost." (p. 195).

Essentially the same position is adopted in Williams (1981), where he suggests that the theory of markedness

can be understood as a map of (part of) the language acquisition device: The "unmarked case" can be understood as the child's initial hypothesis about language (in advance of any data) and a dimension of variation can be understood as an ordered set of hypotheses

about a particular aspect of linguistic structure that the child successively submits to empirical testing in learning a language." (p. 8)

It seems clear that if one adopts this particular formulation of the theory of markedness then a claim that a particular setting is the 'initial setting' along some parameter based on acquisition data or otherwise) amounts to the claim that this value constitutes the 'unmarked case.' This is true by definition.

A very different approach to markedness, and one which is fairly standard in phonological theory, is to evaluate the relative markedness of different grammatical (phonological) systems on the basis of strictly formal criteria (Chomsky and Halle, 1968; Cairns, 1969; Kean, 1975; 1979). Within these theories considerations of acquisition do not enter into the determination of markedness except in the broad sense that the final grammar is assumed to be the least marked system compatible with the data. As Kean (1979) notes there are several possible situations which distinguish the two approaches to markedness. For example, consider the following situation (from Kean, 1979).

. . . take two children . . . [who] arrive at the same grammars, $G_{L\alpha} = G_{L\beta}$. Starting from the same initial equivalence, $G_{0\alpha} = G_{0\beta}$, due to different experience one child arrives

at the intermediate state $G_{i\alpha}$ while the other other arrives at $G_{i\beta}$, $G_{i\alpha} \neq G_{i\beta}$. While they ultimately arrive at the same final state the children progress through a distinct number of stages. . . . In this case the Rouveret and Vernaud hypothesis would make the claim that $G_{L\alpha}$ was more or less (but not equally) marked than $G_{L\beta}$. However, under the markedness theory given here $G_{L\alpha}$ would be as marked as $G_{L\beta}$. (p. 53)

Due to the inconsistency of the two approaches, Kean distinguishes the notion of markedness from that of "attainability" of final grammatical states, where "attainability" is taken to mean "the number of successive grammars which the child will entertain in the course of some G_L ." (p. 54) Given a notion of "attainability," as distinct from markedness, our analysis of the initial parameter settings commits us to the position that certain grammars are more "attainable" though not necessarily less marked. With respect to the specific analyses proposed in this thesis, if AG is identified as PRO at the initial state, all else being equal, the grammar of a pro-drop language, for example, Italian, is more "attainable" than the grammar of a non-pro-drop language like English, though again, not necessarily less marked. Similarly, with regard to the intermediate grammars, G_i represents a more "attainable" grammar than G_{i+1} .

In studying grammatical development one would like to understand how considerations of markedness actually bear on this process. It seems to us that this particular issue can only be profitably addressed if we keep separate the notions of "attainability" and "markedness." It then becomes an empirical question whether grammatical development proceeds steadily in the direction of greater markedness, or whether, for example, the child's desire to reduce markedness in a current grammar is the impetus for restructuring towards a less marked system⁴-- these being two of several possibilities. The latter suggestion is particularly attractive in that it may contribute towards an explanation of restructuring in the developing grammars, or more precisely, why certain data induce a restructuring at a particular point in time--a phenomenon which is poorly understood at present (see Chapter Three; Section 4).

In light of these considerations we will adopt Kean's distinction between "attainability" and "markedness." We thus leave open the question of the relationship between grammatical development and the theory of syntactic markedness until both areas are better understood.

4.0 The Logical Problem of Acquisition vs. the Problem of Actual Acquisition

Broadly speaking, there are two general approaches to the problem of language acquisition. In the first approach, one investigates properties of adult grammars in order to uncover principles of UG--the assumption being that these principles restrict the "hypothesis space" available to the child in constructing the grammar of his language, thus explaining the rapidity and uniformity of acquisition in the face of impoverished data. This, of course, characterizes the research paradigm of the Theory of Generative Grammar. Within this framework, one idealizes to an "instantaneous model of acquisition" in which only the actual idealized moment of acquisition is considered. Hence, acquisition data are ignored. The acquisition problem, as it is addressed within this framework, has been referred to as the 'logical problem of acquisition' (Hornstein & Lightfoot, 1982).

In the second approach to the acquisition problem, adopted by the overwhelming majority of developmental psycholinguists, one considers only acquisition data. The emphasis is on uncovering regularities in child language, and on isolating the ways in which child language "deviates" from adult language in order to describe the linguistic competence of the child at

various points in development. The acquisition problem, as it is formulated within this approach, has been referred to as 'the problem of actual acquisition' (Weinberg, 1981). In general, in addressing the 'problem of actual acquisition,' theories of natural language, be they syntactic, semantic, or otherwise, are largely ignored.⁵

There is a tacit assumption (often made explicit) shared by most acquisition researchers (and many linguistic theorists) that these two approaches to the acquisition problem are somehow incompatible, and that the problems addressed are different because the data bases are different. What we hope to have shown in this thesis is that the two approaches are in fact compatible, and that, with regard to syntactic development at least, the 'logical problem of acquisition' and 'the problem of actual acquisition' are the same problem: determining how it is that the child arrives at an adult grammar.

Notes to Chapter VI

¹Bates (1976) reports that between the ages of 1;3 and 1;7, Francesco produced 64 utterances containing verbs, none of which contained a lexical subject. Similarly, of the 64 utterances produced by Claudia between the ages of 1;3-1;5 only eight contained lexical subjects. We should note that 6 of these 8 subjects were post-verbal which could suggest that our hypothesis is in fact wrong. However, it is not clear that 6 utterances constitute a sufficiently large sample from which to conclude anything. Following this period, lexical subjects appear in both pre-verbal and post-verbal positions, as was the case for the children we studied.

Bates notes that there is a "statistical preference" for post-verbal subjects. She attributes this to a pragmatic strategy by which the children tend to place the 'topic' or 'given' information in sentence final position. As we noted in conjunction with the Avoid Pronoun Principle (Chapter Three), the shape of a particular token utterance is an effect of grammatical factors and the pragmatic conditions under which it is uttered. Thus, we see again that particular pragmatic strategies operate within the constraints of particular grammars. The grammar of Italian allows post-verbal subjects (for the reasons discussed in the text), and thus they may appear in sentence final position in accordance with the strategy proposed by Bates.

²My discussion in this section has profited greatly from conversations with Bob Fiengo and Chuck Cairns.

³Although we discuss the Rouveret and Vergnaud proposal from a developmental perspective, it should be noted that it is explicitly not their purpose to provide a model of language learning. Rather, their definition of markedness is an attempt "to characterize in the most neutral terms the notion 'complexity of a grammar.'" (p. 196, fn. 71).

⁴This possibility was pointed out to me by Bob Fiengo.

⁵Learnability Theory (Wexler and Culicover, 1980) approaches the acquisition problem from yet a third perspective. Wexler and Culicover formulate a set of constraints on transformational rules which make the set of transformational grammars "learnable" on the basis of simple, accessible data, i.e., data which is readily available to the child in the linguistic environment. Although

Wexler and Culicover are not directly concerned with the intermediate grammars, considerations of the "feasibility" of grammars vis-a-vis actual acquisition are central to their theory.

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