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Universal Grammar in L2 Acquisition

by

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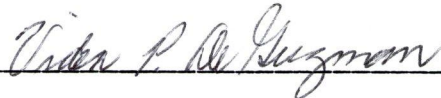
THE UNIVERSITY OF CALGARY

FACULTY OF GRADUATE STUDIES

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ABSTRACT

UNIVERSAL GRAMMAR IN L2 ACQUISITION

The salient points of Chomsky's theory of Universal Grammar (UG) are discussed as they relate to first language acquisition. Research which motivates the hypothesis that first and second language acquisition processes are essentially similar is reviewed. Particular emphasis is placed on the application of Universal Grammar to second language learning theory.

It is argued that crucial facts concerning the initial and final states for an L2 learner cannot be captured within a theory of UG and that the final state for adults is qualitatively different than that for children.

Studies on structure-dependence in children's grammar formation and hypotheses of metalinguistic development in children are reviewed and compared to production and judgement data from a study of Arabic speaking adults learning English as a second language. Results indicate that the production errors of a group of L2 learners could not be explained using a theory of UG. It was not possible to say if adult's intuitions were based on the same kind of information as children's.

It was concluded that UG does not inform the crucial facts of SLL and that there is no evidence that the intuitions of L2 learners are based on the same kind of linguistic processes implied in a theory of UG.

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DW
August 18, 1989

For
Murphy

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INTRODUCTION

Everyone has experienced the delight, amazement and wonder at a child's first words. Contrast that thought with the feeling of awkward embarrassment at an adult's early attempts in a second language. The disparity between these sentiments motivated this thesis.

Despite a prevalent position in the literature, I wanted to investigate what I perceive to be very different processes in first language acquisition and second language learning. The first step in what could easily become a lifetime's work was to consider a precise theory of first language acquisition to see how it would account for second language learning. One of the more compelling explanations for first language acquisition is Noam Chomsky's theory of Universal Grammar (UG).

I have outlined the relevant details of Chomsky's perspective on the organization of mind, Universal Grammar and first language acquisition (Chapter 1). This section is not intended as a critique of Chomsky's position since my eventual purpose is to evaluate how other researchers have applied UG theory to the second language learning domain.

I have included a brief review of research which motivates the conclusion that language learning is essentially the same for both children and adults (Chapter 2). I have highlighted the application of UG theory to second language learning not only to limit the

discussion but also because this line of inquiry makes the assumption that first and second language acquisition are equivalent processes.

However, I have argued that this approach is unacceptable (Chapter 3). While true to a degree, the premise that first and second language learning are similar in kind is not sufficiently substantiated to warrant a wholesale transfer of terminology and underlying assumptions. The idea developed here is that second language data informs a theory of UG but the reverse is only partially true. In addition, I hypothesize that adult's intuitions about a second language would not necessarily be reflected in their speech.

To test this position, I set out to compare specific results from first language research and an adult study which I carried out (Chapter 4). I reviewed two studies (Crain & Nakayama, 1987; Nakayama, 1987) which examined the notion of structure-dependence in children's grammar formation. Also, I surveyed some of the literature on metalinguistic development in children. My predictions for this kind of comparative research were that (a) adults would produce a wider variety of systematic errors and that (b) adults could not make full use of their grammatical knowledge in a production task.

I have reported the results of a factorial design experiment with a found group of Arabic speaking adults learning English as a second language (Chapter 5). In a partial replication of Crain & Nakayama (1987), the subjects were required to convert declarative sentences into yes/no questions. In the second section of the study, the systematic errors from the production task were incorporated into a grammaticality judgement task. The results of the study were contrasted with the findings in comparable first language acquisition research.

I believe there are implications from this study which bear directly on the theory of UG (Chapter 6). The view that UG theory only partially informs the facts of second language learning is supported by the data. There is also evidence which suggests that, unlike children, the internalized knowledge of the adult learner develops in a way that renders it unavailable for certain tasks.

CHAPTER 1

THE CHOMSKYAN PERSPECTIVE ON LANGUAGE

In the first half of the twentieth century, behaviourists like B.F. Skinner attempted to account for language behaviour within a framework of instrumental conditioning. The essential tenet of behaviourism was that elements of the environment shape behaviour. Behaviourist learning theory was founded on extensive experimental work which had the principal aim of discovering how responses can be reinforced (or extinguished). Essentially, a behaviourist view was that "prediction and control of behavior can be achieved without speculation about internal mechanisms...or theoretical processes" (Tarpy & Mayer, 1978, p. 63).

In 1959 Noam Chomsky published a review of Skinner's new book *Verbal Behavior*. In his review, he questioned Skinner's application of research paradigms based on animal behaviour to the area of human language. "What is necessary...is research, not dogmatic and perfectly arbitrary claims, based on analogies to that small part of the experimental literature in which one happens to be interested" (Chomsky, 1959, p. 43).

Chomsky also refused to accept that the environment alone shapes language. "The composition and production of an utterance is not simply a matter of stringing together a sequence of responses under the control of outside stimulation and intraverbal association" (Chomsky, 1959,

p. 55). He does acknowledge that "certain types of social interaction [may] play a triggering role and [that] there is no doubt that environmental factors play a shaping role" (Reiber, 1983, p.50). Nevertheless, Chomsky would no doubt maintain that we cannot specify environmental effects on language until we know precisely what language is.

Chomsky argues that humans come 'equipped' with innate knowledge about the general structure of their environment. Language in particular develops from innate (and therefore, biological) principles present in the human genetic endowment. In Chomsky's words,

It seems to me reasonable to speculate that a substantial part of our knowledge about language, about the behavior of objects in three-dimensional space, about other people, and the like, is knowledge that grows in the mind on the basis of a system of innate principles rather than knowledge that is grounded in experience; though the latter category too exists no doubt, in domains where built in structure is inadequate. (Chomsky, 1981b, p. 18)

According to Chomsky, neither can behaviourism account for creativity in language - the ability to understand and produce an (essentially) infinite number of utterances. Children at a very early age are not only creative (in this sense) but they also learn to detect ambiguity and

distinguish possible sentences from impossible ones (Lightfoot, 1982). This led Chomsky to the conclusion that all children, regardless of situational factors, construct a complex and abstract grammar in "an astonishingly short time [and] to a large extent independently of intelligence" (Chomsky, 1959, p. 57).

To buttress his innatist view, Chomsky points to the Argument from the Poverty of Stimulus or what is sometimes called the logical problem of language acquisition.

A consideration of the character of the grammar that is acquired, the degenerate quality and narrowly limited extent of the available data, the striking uniformity of the resulting grammars, and their independence of intelligence, motivation, and emotional state, over wide ranges of variation, leave little hope that much of the structure of the language can be learned by an organism initially uninformed as to its general character (Chomsky, 1965, p. 58).

These views of language are clearly related to a general perspective on the organization of the mind. Chomsky does not accept the logic that "higher mental faculties are in some manner dissociated from [the] complexity of organization [associated with physical organs]" (Chomsky, 1979, p. 81). Chomsky sees the mind as a system of 'mental' organs that are "highly specific systems

organized according to a genetic program that determines their function, their structure, the process of their development, in quite a detailed manner" (Chomsky, 1979, p. 83).

Chomsky posits a distinct language faculty as one of those mental organs. The language faculty interacts with other cognitive abilities but possesses principles of organization and function which are uniquely linguistic. Thus, "the linguist's task is to discover the nature of the data, the language faculty, the language and the structured expressions determined by the language" (Chomsky, 1988, p. 60). The right kind of linguistic research can, in principle, isolate the 'contents' of the language faculty.

Chomsky (1986) claims that "the language faculty is a distinct system of the mind/brain, with an initial state...common to the species....Given appropriate experience, this faculty passes from the initial state...to some relatively stable state, which then undergoes only peripheral modification" (p. 25). However, he also states that there is more to a language faculty than linguistic information: "[It] involves a precisely articulated *computational system* - fairly simple in its basic principles when modules are properly distinguished" (Chomsky, 1986, p. 204: my emphasis).

The language faculty, as a distinct module of the mind, likely contains many constituent parts. The part which has received almost exclusive attention in Chomsky's recent work is Universal Grammar (UG) and can be defined as "an account of the initial state of the language faculty before any experience" (Chomsky, 1988, p. 61).

Universal Grammar

In a recent version of his theory (Chomsky, 1981a), UG consists of interacting subsystems. According to Chomsky, there are two ways to interpret this statement. One view specifies, in very abstract terms, how language is generated by *subcomponents of a rule system*. In a break from early work on transformational grammar, rules are general statements that do not rely on input conditions to become operative. As Chomsky says, "the notions 'passive', 'relativization' etc., can be reconstructed as processes of a more general nature, with a functional role in grammar, but they are not 'rules of grammar' in the present sense" (Chomsky, 1981a, p.7).

A second approach which has become more prevalent in recent work is to isolate *subsystems of principles* which constrain the output of the rule system. These principles limit, for example, such things as the relation between the head and constituent categories in a construction, the assignment of thematic roles, and the relation of anaphora

to antecedents. (For an accessible treatment, see Sells, 1985).

Taken together, a system of rules and a system of constraining principles comprise the focus for a theory of universal grammar. However, there are two levels of analysis associated with this investigation.

Firstly, a *descriptively adequate* proposal defines a (generative) grammar which is "a system that specifies phonetic, syntactic and semantic properties of an infinite class for potential sentences...[and] is a representation of...'intrinsic competence'" (Chomsky, 1980b, p. 75). This represents the linguistic knowledge of an idealized mature speaker/hearer which is "abstract[ed] away from many factors that interweave with tacit competence to determine actual performance" (Chomsky, 1966a, p. 75 f.n. 2). A descriptive theory is a proposal about the *final state* of a particular language.

A second level of analysis with *explanatory adequacy* specifies an *initial state* of the human mind that makes the acquisition of specific grammar possible consistent with available data and the restrictions of time.

An explanation for the linguistic intuition - the tacit competence - of the speaker...would be based on the assumption that the specifications of the [language

acquisition device] provide the basis for language acquisition" (Chomsky, 1966b, p. 21).

Thus, theories of descriptive and explanatory adequacy are inextricably related insofar as a characterization of mature knowledge (i.e. tacit competence) bears on a specification of the initial state of the language faculty (i.e. universal grammar) and, naturally, *vice versa*. Chomsky is instructive on this rather elusive relationship.

It seems that there are several components in a [particular] grammar, several classes of rules, each having specific properties, linked in a manner determined by the principles of universal grammar. The theory of universal grammar has as its goal to determine precisely the nature of each of these components of the grammar and their interaction (Chomsky, 1979, p. 181). Each...grammar will underlie judgements and understanding and will enter into behavior. But the grammar - a certain system of knowledge - is only indirectly related to presented experience, the relation being mediated by UG (Chomsky, 1981a, p. 4). The grammar of a particular language is an account of the state of the language faculty after it has been presented with the data of experience (Chomsky, 1988, p. 61).

It should be clear at this juncture that Chomsky's Universal Grammar is a biological concept. Chomsky uses the term to refer to the initial, pre-experiential state which contains "those properties of human biological endowment [that are] 'biologically necessary'" (Chomsky, 1980a, p.28). By extension, we can say that tacit linguistic knowledge has a biological foundation in that it results from the interaction between Universal Grammar and experience.

The Explanation for First Language Acquisition

From a Chomskyan point of view, first language acquisition is the result of the interaction between linguistic experience and the initial state (i.e., UG). Chomsky envisages Universal Grammar as "a finite set of *parameters*, each with a finite number of values... which must surely be learned by direct experience" (Chomsky, 1981a, p. 11, *my italics*). Chomsky uses the analogy of a switch box, where Universal Grammar contains a vast, complex array of switches (parameters) which can be 'set' one way or another. Thus, exposure to language input causes a parameter to be fixed in a certain way.

A *core grammar* is the end result of parameter setting. In the absence of disconfirming evidence, a parameter remains in the open selection. It could be that setting a single parameter "may have complex effects, with

proliferating consequences in various parts of the grammar" (Chomsky, 1981a, p. 6).

To take a concrete example, there has been some work done on the so-called "pro-drop parameter" (see Chomsky, 1981a for a complete account). Languages seem to group according to whether or not they allow (a) a missing subject and (b) free inversion in simple sentences. In the following illustration from Italian (1) and French (2), we have two seemingly unrelated properties that a theory can, so the argument goes, reduce to a single formal condition (i.e. the pro-drop parameter).

- (1) a. *ho trovato il libro.*
 "(I) found the book."
 b. *ha mangiato Giovanni.*
 "Giovanni ate."
- (2) a. * *ai trouvé le livre.*
 b. * *a mangé Giovanni.*

Chomsky points out that there appears to be an intuitive correlation between the inflectional system of the verb and a language's lack of overt subject. In other words, a verb system that marks for subject (e.g. 1a) allows the nature of that subject to be recovered.

From the standpoint of the language learner, fixing a parameter leads to knowledge about "other properties of the language which follow from this choice of value" (Chomsky, 1981a, p. 241). A theory of parameters is at the level of

descriptive adequacy because it specifies a cluster of facts that any speaker of Italian or French knows instinctively.

As negative evidence becomes available and parameters are reset in permissible ways, a new 'layer' is added to the grammar of the idealized learner. A marked *periphery* is related to core grammar (Chomsky, 1981a, p.8) and contains such things as historical borrowings, idiosyncratic irregularities and other exceptions to the conditions of core grammar (see Salkie, 1987 for a comprehensive discussion).

Markedness denotes preference for a certain condition or structure over another. In Chomsky's words, "a theory of markedness...imposes a preference structure on the parameters of UG" (Chomsky, 1981a, p.8). This notion of markedness suggests that "processes of maturation may be such as to permit certain unmarked structures to be manifested only relatively late in language" (Chomsky, 1981a, p. 9).

There is another sense of markedness that allows the theory of UG to account for apparent exceptions to a rule or principle. For example, a candidate for a principle of UG, the binding principle, makes predictions concerning reflexives (among other things). However, it does not cover all uses of reflexives as the following example shows:

- (3) a. Susan hit herself.
b. ? John and herself were hit.
c. * Herself was hit by Susan.

The use of reflexives for stylistic purposes (3b) may be only marginally acceptable to some, but a majority of speakers would find (3c) unacceptable. Marked structures like (3b) form part of the periphery.

Chomsky says that "we would expect the order of appearance of structures in language acquisition to reflect the structure of markedness" (Chomsky, 1981a, p. 9). He rightly advises caution, however, because of the many factors (e.g. saliency, frequency) that could potentially affect acquisition in non-idealized conditions.

In summary, an explanatorily adequate theory of first language acquisition must specify the initial state for the language learner. The Chomskyan perspective states that universal grammar, as one constituent of the language faculty, interacts with experience to produce a core grammar (and a marked periphery) through a process of parameter setting which is influenced, in part, by a preference structure of markedness.

Naturally, every actual language "will incorporate a periphery of borrowings, historical residues, inventions and so on which we can hardly expect to... incorporate into a principled theory of UG" (Chomsky, 1981a, p.8).

Inextricably linked to a theory of the initial state is a

descriptively adequate theory of the final state, or competence.

Competence and Performance

Chomsky (1980a) distinguishes between *grammatical* and *pragmatic* competence. The latter refers to the knowledge of "the conditions under which it is appropriate to use a sentence...[and] what purposes can be furthered by appropriate use of a sentence under given social conditions" (p. 224).

Grammatical competence is a theoretical construct which represents a hypothesis about "the system of rules and principles that [have]...been internally represented...[and] enable the speaker, in principle, to understand an arbitrary sentence and to produce a sentence expressing thought" (Chomsky, 1980a, p. 201). Given that first language acquisition is inevitable, it follows that competence also has its foundation in biological necessity. For empirical purposes, competence is linguistic knowledge with the limitations of performance removed. (Any further reference to competence in this paper will refer to grammatical competence.)

A theory of *performance* entails pragmatic and grammatical competence as well as the structure of memory, the organization of experience, etc. Chomsky makes clear the relation of performance to competence:

Actual investigation of language necessarily deals with performance, with what someone does under specific circumstances. We often attempt to devise modes of inquiry that will reduce to a minimum factors that appear irrelevant to intrinsic competence, so that the data of performance will bear directly on competence....To the extent that we have an explicit theory of competence, we can attempt to devise performance models to show how this knowledge is put to use (Chomsky, 1980a, p. 225).

Chomsky (1965) is careful to point out that a learner may not be "aware of the rules of the grammar or even that he can become aware of them, or that his statements about his intuitive knowledge of the grammar are necessarily accurate" (p. 8). In addition, a theory of competence says nothing about how the learner might derive a structural description given a particular generative grammar.

Competence emerges over time, culminating in the mature state. Chomsky (1980a) suggests that the 'steady state' "seems to change only marginally (say, by the addition of new vocabulary)" (p. 37). First language competence is, by definition, a complete construct of internalized linguistic knowledge in that a native speaker can produce and interpret any well formed utterance in his/her language.

Secondly, competence also entails a complete metalinguistic ability. In the context here, this refers to the ability (a) to perceive the native language as an identifiable 'object' and (b) to form intuitions on well-formedness and ambiguity based on this perception.

Native speaker intuitions are generally uniform across members of the same speech community. Intuitions can also be relatively spontaneous (e.g., self-repairs) or deliberative (e.g., grammaticality judgements). There is some evidence that intuitions can also vary with emotional state (Carroll, Bever, & Pollack, 1981). Individuals will vary greatly in their ability to articulate the knowledge they have about their native language. However, this does not affect the claim that all native speakers are essentially identical in all crucial aspects of their competence.

Chomsky's theory of Universal Grammar offers a precise explanation for the logical problem of first language acquisition: How do humans come to know certain facts about their native language given that this information is not readily available from the linguistic environment? Competence theory is inseparable from UG theory since competence is a specification of UG principles after the mediation of experience. Put another way, competence is a

representation of the tacit linguistic knowledge of a native speaker.

Given the empirical and conceptual precision of Chomsky's ideas, it is not surprising that researchers have attempted to apply them to other domains (e.g., adult second language learning). This move rests on the assumption that children and adults acquire language in the same way. In the next chapter, I will explore the idea that first and second language learning are comparable processes. More specifically, I will review the literature which extends Chomsky's theory of UG into an investigation of second language learning.

CHAPTER 2

EXTENDING A CHOMSKYAN VIEW TO SECOND LANGUAGE LEARNING

There are a number of reasons why we might expect first and second language acquisition to resemble one another in fundamental ways. The simple observation that humans are capable of learning a second language (L2) at any time in their lives is reasonable cause to speculate along these lines. It is also the case that both children and adult language learners are relatively impervious to formal instruction. Children, especially, do not respond readily to corrections on structure (Lightfoot, 1982). Selinker (1972) observed that the production of a vast majority of second language learners *fossilizes* (i.e., retains incorrect forms despite efforts to eradicate them). There are, however, more compelling and substantial reasons for suggesting that an explanation for first language acquisition could extend to second language learning.

A strong argument for positing innate linguistic principles derives from the premiss that children do not receive the kind of negative information they would need to rule out ungrammatical structures. For example, English speakers subconsciously come to know that sentences like (4) are not possible even though this information is not part of the linguistic input during childhood.

(4) * Who did you see the woman that met in town?

The solution to this logical problem of language acquisition is that the language faculty "has the capacity to project solutions about properties of the target language on the basis of no, or very little, evidence in the input data" (Zobl, 1983, p. 296).

There are no *a priori* reasons to reject the notion that an identical state of affairs exists for L2 learners. White (in press) argues persuasively that the input for adult L2 learners is deficient in the same ways as it is for children. That is, (a) input does not consist uniformly of complete, well-formed utterances and (b) the range of input is finite but language learners come to know an infinite range of structures.

To illustrate this point, native speakers know that 'easy to please' refers to 'John' but that 'eager to please' refers to someone other than 'John' in the following sentences:

- (5) a. John is easy to please.
- b. John is eager to please.

Cook (1973) found that L2 learners can distinguish between sentences like these after a certain amount of general instruction. It isn't likely that the type of information needed for this distinction comes through instruction or solely from exposure to the relevant input. Chomsky (1969) has also remarked that "only a trivial part

of the knowledge that the second language learner acquires is presented to him by direct instruction" (p. 68). The conclusion is that this knowledge derives from a property of the mind.

Evidence also suggests that neither children nor adult learners produce haphazard strings (Clahsen & Muysken, 1985; Ritchie, 1978; Schmidt, 1980). Findings of this sort support the conclusion that the same innate linguistic principles constrain the initial hypotheses which both children and adults make (metaphorically) in the course of language learning.

It is generally assumed that children go through a relatively fixed sequence of development. (See Owens, 1984 for an overview. Crain & McKee, 1985 discuss an alternate view.) The notion of a 'natural' sequence implies that the same underlying mechanisms are at work in all first language (L1) learners.

Based on the acquisition of certain grammatical morphemes found in Brown (1973), early second language learning research looked for a *natural order* for children (e.g., Dulay & Burt, 1973, 1974) and adults (e.g., Bailey, Madden & Krashen, 1974). The procedure in all these morpheme acquisition studies was essentially similar. Oral (and later, written) data were collected using a picture description task. The analysis was based on the number of

times a functor was correctly supplied in an obligatory context. This produced a rank order of morphemes (*accuracy order*) which was equated to an *acquisition order* with the justification that the more accurately an item is produced the sooner it is acquired.

Bailey, Madden & Krashen (1974) replicated the Dulay & Burt research but employed adult second language learners from a variety of first language backgrounds. They found a high correlation with the accuracy orders of child second language learners. This led them to the conclusion that, regardless of age or first language, there is a natural order of acquisition for second language learners.

Ellis (1984) generalizes to a developmental sequence from longitudinal research literature (e.g., Hakuta, 1976; Huebner, 1979; Rosansky, 1976). His first stage is characterized by a standard word order reminiscent of telegraphic speech (e.g., 'Me house.'). In the second stage, the learner begins to expand his/her propositions and to vary the word order more in line with the target language. In the third stage, grammatical morphemes are used systematically. The fourth stage marks the appearance of complex sentence structures.

Ellis (1986) claims that this sequence of development is the product of a universal cognitive mechanism and is, thus, the same for all second language learners. Every

learner will pass through the four stages but will vary according to when or if specific grammatical features appear in his/her production (*order of development*).

The list of similarities between first and second language acquisition is potentially quite long. However, the illustrations here are sufficient to point out that a comparison of the two would be productive. In order to focus this discussion, recall that Chomsky's mentalist view of first language acquisition stresses the importance of internal mechanisms such as a species-specific, independent language faculty.

The basic tenets of a mentalist view of first language acquisition carried over into the second language arena in the form of an *interlanguage* (IL) hypothesis (Selinker, 1972). Nemser (1971) outlined additional assumptions of interlanguage theory: (a) the IL system is distinct from the native and target languages, and (b) the IL system is constantly evolving. Corder (1975) suggests that first and second language acquisition are essentially the same with differences due to maturational development, motivation, etc.

The important point is that the basis for the interlanguage hypothesis is the assumption that the emerging second language grammar is a **natural language** and is therefore comparable to first language acquisition in a

number of different ways. This revelation in the early 1970's formed the philosophical and empirical basis for a flood of research into the parallels between first and second language acquisition processes.

The mentalist view of the language learner's knowledge of language as an internal system which is gradually revised in the direction of the target language system underlies the notions of 'Acquisition Device' and 'interlanguage'. [First and second] language acquisition both involve transitional competence and...this is reflected in similarities which are not total but nevertheless are strong, between both the acquisitional routes and the strategies that are responsible for them....In so far as these mechanisms are innate, [first and second language acquisition] will proceed in the same way (Ellis, 1986, p. 68).

The Universal Hypothesis is a claim that an identifiable 'portion' of second language learning is determined solely by the linguistic factors inherent in first and second language. Empirical work in the area of linguistic universals is generally divided into the *data driven* approach (e.g., Comrie, 1981; Greenberg, 1966) and the *theory driven* approach associated with Chomsky.

The two schools differ in two important ways. Firstly, explanations for putative universals tend to be eclectic in

the former; very specific in the latter. Secondly, universal typological patterns are based on analysis of a representative sample of the world's languages. This contrasts with the deep analysis of a single language advocated by Chomsky.

For example, the Accessibility Hierarchy (Comrie & Keenan, 1979; Keenan & Comrie 1977) is a universal hierarchy of grammatical relations out of which relativization can take place. Languages of the world are differentiated according to the 'lowest' position which can be relativized.

(6) *Accessibility Hierarchy* (in decreasing order)

Subject	The house that __ fell down
Direct Object	The house that Jack built __
Indirect Obj.	The girl that I wrote a letter to __
Oblique	The house that I talked to you about __
Genitive	The man whose wife he covets
Object of Comparative	The woman that I am taller than __

Gass (1979) sets out to determine if the Accessibility Hierarchy (AH) can be used to predict patterns of language transfer - "patterns of the native language (of all levels of linguistic structure), including both form and functions of elements [which] are imposed on the patterns learned in a second language" (p. 328).

Predictability of transfer patterns between native and target languages is a hypothesis associated with a strong version of the Contrastive Analysis Hypothesis (CAH). The

CAH states that (a) two languages can be compared to determine similarities and differences and (b) similarities are learned easily but differences result in a greater number of errors.

In Gass' study, seventeen high proficiency level students from nine different language backgrounds were asked to perform a receptive task (acceptability judgement) and productive task (sentence combining) with structures containing relative clauses.

Gass' results indicate that the more accessible positions (e.g., subject, direct object) are produced more often and more accurately. This led her to suggest that "the areas of difficulty for these groups can be predicted on the basis of universal properties of [relative clauses] rather than on the basis of language specific properties" (p. 339).

Interestingly, the genitive construction is produced more accurately than the AH predicts. "Despite the universality of the AH and its active role in L2 learning, its modification by intralingual factors is indeed possible" (p. 341). According to Gass, one possible explanation is that 'whose' is a unique grammatical marker with no variants. As Gass rightly points out, the hierarchy is not "a rigid constraint which must be followed in all instances. Additional linguistic factors may come into play which can

overcome the natural ordering which this hierarchy imposes on learning" (p. 339).

In another representative study of typological universals, Eckman (1977/1987) employs an implicational hierarchy of voicing contrast. "Any language which maintains a voice contrast in obstruents word-medially necessarily maintains this contrast word-initially but does not necessarily maintain such a contrast word-finally" (p. 62). For example, English has voicing contrast word-initially, -medially and -finally. German does not have a contrast word-finally and is, according to Eckman's analysis, less marked.

The notion of an implicational hierarchy leads to a concept of *typological markedness* which Eckman defines as follows:

Markedness: A phenomenon A in some language is more marked than B if the presence of A in a language implies the presence of B; but the presence of B does *not* imply the presence of A (p. 60; original italics).

This definition of markedness gives rise to his *Markedness Differential Hypothesis* (MDH) which states that areas of difficulty for a language learner can be predicted from a systematic comparison of native and target grammars as well as the markedness relations stated in (typological) universal grammar. The MDH correctly predicts the

'directionality of difficulty'. That is, German learners of English have greater difficulty with word-final voicing contrasts than those with contrasts word-initially or medially.

Eckman maintains that the addition of universals as a means to contrast two languages improves the precision of a strong version of the Contrastive Analysis Hypothesis. The MDH provides a theoretical framework (i.e., typological universals) for "resolving the controversy between whether second language learning errors are due to interlingual or intralingual interference" (p. 67).

Eckman further claims that the acquisition of voicing contrasts in first language acquisition parallels a typological markedness scale from L2 data. Based on the MDH, he suggests that there should be a similarity between patterns of first and second language phonological errors. The MDH also predicts that "errors will be dependent on the native language to the extent that the areas of difference between the native and target language are marked" (p. 67).

While Eckman makes specific reference to first language acquisition, Gass (1979) does not. However, inherent in any claim to universality is the assumption that production and possibly developmental patterns will reflect universal linguistic (or cognitive) principles. That is, if a hierarchy or principle is put forward as a true universal,

then it should be evident in any instance of language learning. It seems, then, that a typological universal framework entails the notion of parallelism between first and second language acquisition whether explicitly stated or not.

Universal Grammar in Second Language Research

Flynn (1987b) clearly states what role formal universals might have in an overall theory of second language learning:

If principles of UG do provide for a language faculty which is biologically determined and which is sufficient to explain how language acquisition is possible, then UG should also underlie L2 acquisition in some way, assuming that the language faculty does not change substantially over time. (p. 29)

White (in press) makes a methodical and convincing case that the theory of UG accurately characterizes the (universal) linguistic 'starting point' for adult L2 learners and that it can make significant predictions about L2 grammar formation. She correctly points out that a theory of UG is not intended to account for all aspects of language learning. The main thrust of her thesis is that the logical problem of language acquisition holds regardless of factors such as age, language background, linguistic typology, etc. "[L2 grammatical knowledge] is attained on

the basis of impoverished input, and this requires an explanation" (p. 42).

Van Buren and Sharwood Smith (1985) conducted a pilot test investigating the effects of government and binding theory as it relates to preposition stranding in the production of Dutch learners of English. Subjects were asked to accept or reject sentences containing correctly and incorrectly stranded prepositions. The exploratory nature of their study limits their findings but they suggest that the notion of markedness in Universal Grammar "provides the general focus for achieving greater precision in the formulation of theories of second language acquisition" (p. 36).

Flynn (1984, 1987a, 1987b) has proposed a parameter setting model of second language (L2) acquisition which focusses on abstract principles of syntactic organization (in this case, embedded subordinate clauses and anaphora in English). She argues that a theory of UG can unite two apparently contradictory findings in the L2 literature. (a) Some aspects of L2 learning seem to be independent of first language (L1) background. (b) There are also many instances of L1 knowledge interfering with L2 learning.

Her thesis is that L2 grammar construction is subject to the same principles of UG argued for in first language acquisition (FLA) and will, therefore, display some of the

same characteristics as an L1 grammar. She predicts that the L2 learner's hypotheses about both L1 and L2 will be structure dependent (p. 64, this work). Secondly, the L2 learner will show a sensitivity to a given parameter in the early stages of acquisition regardless of L1 background. Lastly, experience will play a role in parameter setting such that when a parametric value differs from L1 to L2, the L2 learner must reset the parameter of UG.

Flynn (1987a, 1987b) began with L1 studies which showed that a child's acquisition of anaphora is constrained by a parameter of X-bar theory: *head direction* (HD) (e.g., Lust, 1981). For our purposes here, it refers to the orientation of a lexical head to its complements.

(7) *Head-initial construction*

El niño que come arroz esta llorando.
The child who is eating rice is crying.

Head-final construction

Gohan-o tabete-iru ko -ga naite-imasu.
rice -ACC eat -ing child-NOM cry -is

Children learning English (or Spanish) show a preference for head-initial constructions in the production of subordinate adverb clauses and pronoun anaphora. Japanese children show an opposite tendency.

Flynn tested her hypotheses with two groups learning English (a head-initial language): a Spanish group (head-initial) and a Japanese group (head-final). Each group was

divided into three proficiency levels. Flynn measured the results in two ways: (a) number correct and (b) error analysis.

The results indicate that both groups are operating in a structure dependent manner and not simply going through some kind of astructural translation process. Spanish speakers displayed a facility for manipulating head-initial and -final structures from an early stage. Japanese subjects continued to have difficulty.

In the analysis of number correct, Flynn found that the Japanese were taking longer to 'catch on' to HD although advanced learners appeared to gain control of the head-initial structures. This suggests that Japanese learners need more exposure to English in order to re-set the HD parameter.

In addition, advanced Japanese subjects showed a significant preference for head-initial structures. This is curious given the head-final status of Japanese. Flynn argues that the Japanese subjects were sensitive to the value of the HD parameter and were not looking for a match/mis-match. If they were matching, she points out that they would have performed more accurately on the head-final structures in the early stages.

White (1985a, 1985b) pursues similar reasoning in two studies - *subjacency* (a principle restricting movement

operations) and *Pro-drop* (a parameter which determines a number of properties). "In certain circumstances a parameter of UG appropriate for L1 will be carried over into L2 by second language learners...in circumstances where the L2 data are consistent with...the L1 grammar" (White, 1985a, p. 6-7).

The subjacency study (1985a) was part of a more extensive study on *Pro-drop*. In both cases, subjects were asked to judge the grammaticality of sentences. Test items contained violations of bounding conditions (subjacency) and null subjects, subject-verb inversions and *that*-trace effects (*Pro-drop*).

The subjacency study results partially support the claim that L2 learners carry the subjacency principle over from FLA. The results of the *pro-drop* study confirm that transfer errors may be the result of having to reset an L1 parameter. "Learners have to lose parameters which have been activated in L1, but which are not relevant for L2, and that they have difficulty doing so" (White, 1985b, p. 58).

Phinney (1987) conducted a similar study to White with an added analysis of English speakers learning Spanish. She assumes that the *pro-drop* parameter is unmarked for Spanish and marked for English. In going from an unmarked to marked system (i.e., Spanish to English) learners will commit

errors such as subject omission and improper use of *it* and/or *there*.

English learners of Spanish, in moving from a marked to unmarked system, should produce errors such as overuse of subject pronouns, collapsing of verbal endings to third person singular and insertion of some form of *it* and/or *there*.

Her analysis of production data (free written composition) supports the claim that going from a marked system (English) to an unmarked system (Spanish) will be less difficult than *vice versa*. She concludes that "markedness and parameters do play a role in L2 acquisition, although not in precisely the same way as in L1 acquisition" (p. 286).

Adjemian & Liceras (1984) adopt the position that a learner's emerging grammar is influenced by UG, linguistic knowledge gathered from experience and metalinguistic abilities. All three cognitive capacities interact in unknown ways to shape the hypotheses about a target language. "The acquisition of some fairly subtle differences between related languages has no straightforward unidimensional explanation" (p. 116).

Conclusion

A theory of UG may provide a parsimonious account for first language acquisition (FLA) and second language

learning (SLL). Certainly there is no question within the field that a theory of UG affords a sophisticated and precise tool for measuring subtle distinctions in language production (van Buren & Sharwood Smith, 1985).

Researchers using a Chomskyan framework to investigate SLL hope to discover that the innate principles which shape first language acquisition also play a major role in second language learning. Flynn (1984, 1987a, 1987b) shows that L2 learners retain a sensitivity to certain deep syntactic properties. There seems to be more individual variation in this sensitivity than we might expect if innate principles were operating without restriction (Phinney, 1987). Nevertheless, UG likely plays a role in SLL although its interaction with other cognitive mechanisms remains to be specified (Adjemian & Liceras, 1984).

The conceptual and empirical evidence tends to support the hypothesis that first and second language acquisition processes are comparable. To my knowledge, no one argues that FLA and second language learning (SLL) require mutually exclusive mental abilities. Nor am I aware of any serious work which claims that the two are identical in all respects. What remains an open question is to what extent FLA and SLL processes overlap.

However, as Chomsky (1959) has pointed out, we must be very cautious in applying theory from one field into another

no matter how similar they may appear. Chomsky's argument was that human verbal behaviour could not be equated to animal behaviour. Behaviourist experimental paradigms and their accompanying theoretical bias had no place in the domain of cognitive psychology.

I will develop an analagous argument in the next chapter. That is, child first language acquisition and adult second language learning are different in crucial respects. If this is the case, then wholesale transfer of a theoretical framework for FLA to the SLL domain is methodologically questionable.

CHAPTER 3

UNIVERSAL GRAMMAR IN SECOND LANGUAGE LEARNING: A RE-EXAMINATION

In theory, the principles of UG are present *in toto* and available to the first language learner (White, 1982). To account for developmental stages, White suggests that the child constructs an optimal grammar for a certain body of data. When the child perceives new data, the grammar is no longer optimal and is revised. That is, the perception of the linguistic input must change before the principles of UG come into play.

Alternatively, Felix (1984) proposes a maturational model of UG. According to this view, stages result when a previously unavailable principle of UG becomes available. It is not the type of input nor changes in perception which result in stages, but the maturation of UG. Whatever position one adopts, the basic assumption is that primary linguistic data act directly on UG.¹

It is not possible to say that the same is true for adults. In a study involving grammaticality judgements of sentences which violated principles of UG, White (1985a)

¹ To convey this idea, the expression frequently adopted in the second language literature is that "a learner has access to UG". I find this an unsatisfactory turn of phrase for a variety of reasons that are not relevant here. Therefore, in the interest of maintaining consistency with the research cited here, I will use it as well.

claimed that the respondents' responses were not random. However, forty per cent appeared indecisive which led White to speculate that "one cannot exclude the possibility that some L2 learners do not have access to UG any more, that parameters cannot, for them, be set or reset, so that *ad hoc* behaviour results" (White, 1985a, p. 12). White's hypothesis that UG interacts directly with L2 input, regardless of L1 background, was disconfirmed.

There are three ways in which a second language learner could have access to UG (see Hilles, 1989 and White, in press for detailed discussions). The first possibility is that the learner starts with the original settings for all parameters. The origin of a new group of null settings, whether through duplication or resetting, does not affect the prediction that adult second language learning should be identical to first language acquisition.

A second position is that the learner starts with the instantiation of UG - namely L1. Where settings differ from L1 to L2, there will be positive and negative transfer effects. This is essentially the position of the studies outlined in the previous chapter.

Schachter (1988) states a third possibility: "It is not likely to be the case that the process of second language acquisition will prove to be the same process as in the

first language acquisition case and therefore the question of how the parameters get reset may be irrelevant" (p. 222).

Hilles (1989) correctly points out that "we cannot argue that a subject with incomplete acquisition does not have access to UG, but rather only that there is no evidence that he/she does" (p. 6). This logic has been applied in a number of studies (e.g., Bley-Vroman, Felix, & Ioup, 1988; Clahsen & Muysken, 1985; Felix, 1988; Hilles, 1989).

Structures which are thought to reflect principles of UG are presented to adult second language learners whose L1 background is different from the target language. If the subjects have access to UG, then their intuitions of grammaticality should not differ significantly from those of native speakers.

The prediction has not been entirely supported, according to the studies mentioned above. Bley-Vroman *et al* (1988) conducted a grammaticality judgement task with 92 Korean native speakers living in Texas. (There were also 32 English native speakers used as a control group.) The test items violated or adhered to constraints of *wh*-movement (*subacency*) and the government of non-pronominal empty categories (*Empty Category Principle*). The researchers also included other examples of *wh*-movement as control sentences.

Using the number correct as a measure, they found that the difference between the native speakers' average score

(92%) and the non-native speakers' average score (75%) was statistically significant ($p < .01$). They also state that the non-native speakers' score was significantly better than chance ($p < .01$). The question the authors raised was: "If access to UG explains why the nonnative speakers did better than chance, what explains why they did not do as well as native speakers?" (p. 27).

Hilles (1989) approached the question of access to UG through a nine-month case study of six native speakers of Spanish learning English (two children, two adolescents and two adults). The principle she investigated was the Morphological Uniformity Principle (MUP) which states that only languages with morphologically uniform inflectional paradigms permit null subjects (e.g., Chinese, Spanish, German). Sources cited in her work indicate that children learning either uniform or non-uniform (e.g., English) languages regularly produce null subjects in the early stages of acquisition.

Hilles calculated percentages associated with null subjects and inflection from transcripts of spontaneous production. Based on first language research, the emergence of inflection and pronominal subjects should be reflected in statistical correlation between the two groups of scores.

She did find strong correlations between the emergence of pronominal subjects and inflection with the children

($r=.92$ & $.86$) and one of the adolescents ($r=.93$). This high correlation was not found in the other adolescent ($r=.59$) or the adults ($r=.54$ & $.07$). Assuming that the emergence of the two properties is guided by a principle of UG (in this case, MUP), it would seem that UG effects decline with age.

Clahsen & Muysken (1985) contrasted German word order acquisition in L1 learners and adult L2 learners. Based on longitudinal research on German children, they posit four developmental stages attributable to children. These four stages can be specified using such general (and universal) principles as X-bar theory, move- α and a theory of government.

Using data from a longitudinal study of adult speakers of Romance languages (Italian, Spanish and Portuguese), Clahsen & Muysken attempted to characterize the developmental stages for the acquisition of German word order. Their results stand in sharp contrast to the findings from the child studies, leading them to the conclusion that 'the L2 learners are...creating a rule system which is far more complicated than the native system' (p. 116). Put another way, adult L2 learning "involves general learning strategies while principles specified by [UG] operate in L1 acquisition in addition to general learning theory" (p. 94).

It is clear from the research cited here that we cannot expect primary linguistic data to act directly on UG in the case of adult SLL (cf. White, 1985a above). Given this conclusion, it is difficult to see how L2 grammar could develop in an equivalent way to L1 grammar because there is, in effect, a 'filter' or 'barrier' limiting the influence of UG.

There are other good reasons to doubt the legitimacy of applying UG theory to SLL. Firstly, second language learning does not have the same biological characteristics of first language learners. Secondly, because the process of learning does not proceed in the same way, the final state (i.e., L2 competence) is not comparable to L1 competence.

Second Language Learning is not Biologically Necessary

Lenneberg (1967) and others (e.g., Chomsky, 1981a; Felix, 1984) argue that the onset of speech has the characteristics of maturationally controlled emergence of behaviour. First language acquisition has a certain inevitability which can be compared to other biologically determined abilities (e.g., walking). There are good reasons to argue that adult language learning does not emerge because of biological necessity.

Firstly, first language emerges spontaneously and not in response to social necessity or as a result of a

discovery of its usefulness. Children have no control over whether or not they learn to speak (or comprehend) any more than they have control over when they will walk. A biologically controlled behaviour begins to develop according to a genetically encoded 'clock'.

In contrast, there is a body of literature (e.g., Savignon, 1983; Widdowson, 1978) on second language teaching based on the belief that language cannot be effectively learned unless there is a communicative need. In some cases, even the need to communicate is not enough to ensure second language onset. There is nothing inevitable about second language learning except that it does not emerge spontaneously.

Lenneberg (1967) has argued that early stages of first language development are not practice (i.e., necessary) for later development. That is, although children appear to pass through stages during the course of language acquisition, some children seem to 'skip' stages. Aitchison (1976) has also reviewed a number of studies which support the view that practice (i.e., repetition and imitation) does not affect first language acquisition in any significant way.

There is a common perception among second language teachers and learners that practice is an essential and crucial factor in language learning. In fact, the

suggestion that one could learn a second language effectively without practice is counterintuitive and unrealistic. Naturally, the the effect of practice on second language learning is an empirical question. However, disconfirmation of the null hypothesis (i.e., practice plays no role in SLL) in such a study seems inevitable and probably uninteresting.

Thirdly, a biologically emerging behaviour is characterized by a progression through identifiable common stages within a given time period. Even though there is variation in the developmental sequence among children, the onset of speech is "a series of generally well-circumscribed events which take place between the second and third year of life" (Lenneberg, 1967, p. 127). Whatever 'route' a child takes for language acquisition, language ability is more or less complete between the ages of six and eight.

Even if we grant that second language learners progress through similar stages, there is no guarantee of mastery within a specified time period. In fact, there is a good chance that an adult will never have complete mastery no matter how much time is available.

First language acquisition, like walking, is independent of environmental factors. "The emergence of speech and language habits is more easily accounted for by assuming maturational changes within the growing child than

by postulating special training procedures in the child's surroundings (Lenneberg, 1967, p. 139). (See also Felix, 1984 and Hoekstra & Kooij, 1988 for similar arguments.) Put another way, mere exposure to language is one sufficient condition for first language acquisition to occur.

Unlike first language acquisition, adult learning is very sensitive to emotional, situational and motivational factors. Other strong influences on second language learning include attention span, the ability to concentrate and learning style. Of course, exposure to the second language is a necessary condition, but it is certainly not sufficient.

Lastly, there is a critical period for any biologically controlled behaviour. Lenneberg (1967) suggested that the critical period for first language acquisition ends around puberty. He claimed that "at the beginning, [language acquisition] is limited by lack of maturation. Its termination seems to be related to a loss of adaptability and inability for reorganization in the brain (p. 179)". This claim has become known as the Critical Period Hypothesis (CPH).

It is clear that the 'cut-off' age for first language acquisition (i.e., around puberty) is not applicable to second language learning. That is, the potential to learn a second language is never lost. Is there a biologically

determined critical period for second language learning? Empirical studies show that age does have complex effects on SLL.

The *level of success* measured in terms of general proficiency is affected by the number of years exposure and the starting age (Patkowski, 1980/1982; Walberg, Hase & Rasher, 1978). The *rate of learning* is affected by starting age (Fathmam, 1975/1982). Adults move faster than children through the early stages of syntactic and morphological development. In addition, older children acquire a second language more quickly than younger children (Krashen, Long & Scarcella, 1979). Although adults do better in the initial stages of learning, children achieve a higher success level (Snow, 1983).

Snow (1983) rejects the CPH for SLL because "the pattern of age effects on second language learning...forces us to abandon attempts at neurolinguistic explanations for second language success or failure" (p. 145). Thus, it is not possible to say that there is a biologically determined critical period for L2 learning.

Given that second language development is not driven by biological mechanisms, it is reasonable to suggest that the L2 learning process will not produce the same type of tacit linguistic knowledge. If this is the case, evidence should

show that there are qualitative differences between L1 and L2 competence.

L2 Competence is not Equivalent to L1 Competence

It is uncontroversial to say that an L2 learner internalizes rules which enable him/her to produce and understand language. Given the original use of the term (see Taylor, 1988 for extensive discussion), competence applies in a general way to SLL. Within a theory of UG, however, competence is conceptually bound to the initial state. I have already argued that L2 development does not proceed from a biologically driven initial state. Once the theoretical connection between the initial and final states is lost, the theory of UG loses much of its appeal as a model of language acquisition.

Contrary to the implication inherent in a transfer of terminology, the specific facts of L2 competence are not identical to those of L1 competence. Native speakers (NS), by definition, can interpret and produce **any** well-formed utterance in the native language. Most non-native speakers (NNS) cannot do this. Based on an extensive tradition of L1 research, it is possible to compare the emerging competences of NS children according to age. No such convenience exists for the investigation of L2 competence.

Furthermore, a strict application of UG theory would predict that L1 (a parameterized version of UG) has little

or no effect on SLL (Schachter, 1988). In other words, the non-parameterized principles of UG would 'override' the first language to produce the L2 grammar. I am not aware of any research which ignores the possibility of interference from the first language. I conclude from this that L2 competence is not entirely based on UG.

An L2 learner's production not only fossilizes, but occurrence of fossilized forms varies with performance tasks (Duff, 1986; Tarone, 1983, 1985). The fact of fossilization is highlighted by examples of adult second language learners who are virtually indistinguishable from native speakers. If we assume that there are barriers to SLL such that ultimate attainment is not possible for most learners, we must ask why it is possible for some. Clearly, the characterization of the final state for L2 learners can not be as conceptually uniform as one for first language competence.

The available evidence suggests that the linguistic knowledge of near native speakers is qualitatively (as well as quantitatively) different. Coppieters (1987) selected a group of 21 non-native French speakers who satisfied high level criteria for language proficiency and use. In addition, all subjects learned French as adults.

His study used a battery of 107 sentences containing nine basic grammatical contrasts. The test was administered

as a grammaticality judgement task and was later used as the basis for a 50 minute interview session. Quantifiable results were compiled for the NNS by counting the number of times the subject deviated from a prototypical NS norm. His results show that the NS variation (5% - 16%) and NNS variation (23% - 49%) were significantly different ($p < .005$).

Coppieters also collected qualitative data by interviewing each subject to better understand their reasons for making a particular judgement. This type of data does not lend itself to a pithy summary, but it will suffice to say that NNS diverged the most from NS on subtle judgements of language use compared to (relatively) clear-cut distinctions of syntactic form. While not conclusive, this evidence suggests that first and second language competence are different even at high proficiency levels.

Schachter (1988) observes that global proficiency seems related to an increased ability to identify grammatical sentences as grammatical. Masney & d'Anglejan (1984) stress the importance of sensitivity to deviance as a correlate of emerging L2 competence and language aptitude. Schachter (1988) states:

It would seem that rather than developing a set of criteria enabling one to decide what is grammatical and what is ungrammatical...second language speakers/learners simply acquire a cumulatively larger and

larger set of syntactic patterns that they can identify as ones they have heard native speakers use (p. 225).

Schachter, Tyson & Diffley (1976) tested the intuitions of L2 learners from five different language backgrounds. They elicited judgements of sentences which contained L1-based relative clause errors. They hypothesized that a speaker of a given L1 would recognize errors based on native relative clauses, but would not recognize others. This is, in fact, what they found. "Their knowledge of English differs in a very specific way from that of native speakers and the knowledge of speakers of other language groups" (p. 75, original italics)

Gass (1983) gathered judgements through a written task. Intermediate and advanced students were given well- and ill-formed sentences from their own writing and from the writing of other L2 learners from different language backgrounds. Their tasks were to identify deviant and nondeviant sentences as well as to correct the deviant forms.

She suggested that adults, like children (cf. Gleitman, Gleitman & Shipley, 1972), "have a general feeling of what is right / wrong without being able to zero in on the precise nature of this error" (p. 285). Nevertheless, she found that the intermediate group was able to recognize their own grammatical sentences better than their own

ungrammatical ones or those ungrammatical forms from another language group.

Summary and Conclusion

Recall that in FLA research the initial state refers to the pre-experiential starting point for language acquisition (Chomsky, 1965, 1986). There is no evidence that the potential for language acquisition for children and adults changes over time. However, we cannot assume that an adult's linguistic input acts on UG in the same way as it does for children. Neither is there evidence that adult language learning shares the characteristics of a biologically emerging behaviour.

If a theory of UG is to be applied to SLL, it must somehow encompass the fact that L2 learners do not have the same potential for language ability. Since UG is formulated to account for language acquisition given certain limitations in reality, it is not clear how the theory can be applied to a new set of circumstances (i.e., SLL) where these limitations do not apply. Despite underdetermination of the input, exposure to linguistic data is not a sufficient condition for development of native-speaker ability.

The theory of UG connects innate linguistic principles with the knowledge of a mature speaker/hearer. The emergence of the first language steady state follows in a

straightforward manner (in principle) from putative universals. As a theoretical mental construct, L1 competence is complete.

The term, *competence*, applies to SLL in a general way. I have argued that the internalized system of rules for an L2 learner can only be partially based on principles of UG. Furthermore, the characterization of L2 competence does not result in a uniform description because it appears to be sensitive to limitations (e.g., fossilization). In addition, there is some evidence to suggest that near-native speaker competence is different in kind from native speakers'.

It is certainly true that there are common elements in all instances of language learning and it is undeniable that universal principles play some role. Without discounting the similarities, I believe that focussing on differences between the two leads to a more accurate theory of adult language learning. If the proposals for principles of UG are on the right track, then it should come as no surprise that they are (at least partially) operational in SLL.

However, I believe that this tells us far more about the validity of UG than it does about the facts of second language learning. Whereas the theory of UG provides a powerful research paradigm in first language research, it is only marginally successful in the second language arena. In

other words, L2 production data informs a theory of UG but the reverse is only partially true.

While the role of UG in SLL is controversial, I believe it is safe to say that universal principles are available (possibly 'through' L1). Bley Vroman (in press) proposes that L1 acts as a 'surrogate UG'. Consequently, I would not expect any instances of L2 production to violate established principles of UG. This prediction notwithstanding, I would expect to find that children and adults learn language in fundamentally different ways.

Given these arguments, I set out to test certain predictions about the tacit linguistic knowledge of L2 learners. It also seemed reasonable to compare these results with those found in comparable FLA studies.

In the experiment reported here, I partially replicated a study done with children learning their first language (Crain & Nakayama, 1987). I compared the type of errors and the kinds of explanations which are necessary to account for the adults' data. In addition, I gave the subjects a grammaticality judgement task based on their production errors. From this, a comparison of child and adult metalinguistic abilities followed.

CHAPTER 4

UNIVERSAL GRAMMAR IN PRODUCTION AND JUDGEMENT

In the previous chapter, I argued that a theory of UG does not adequately inform a model of second language learning. Implied in this position is that equivalent studies of children and adults will require different explanations and produce different conclusions without appealing to dissimilarities in non-linguistic development (e.g., cognitive maturity).

In order to explore this possibility, it seemed reasonable to link an empirical study of L2 knowledge based on production and judgement tasks with similar studies done in the FLA domain. As background, I will outline two studies which investigated the effect of UG on first language acquisition. Secondly, I will review the literature on metalinguistic development in children as it relates to production.

Background: Structure-dependence in L1 production

Crain & Nakayama (1987) looked at the phenomenon of *structure-dependence* in the emerging grammars of children. A structure dependent operation is one which considers the hierarchical structure of a sentence and not the linear sequence of elements.

All known formal operations in the grammar of English, or of any other language, are structure dependent.

This is a very simple example of an invariant principle

of language that might be called a formal linguistic universal or a principle of universal grammar.

(Chomsky, 1971, p. 28)

For example, a structure independent hypothesis about yes/no question formation uses concepts such as 'leftmost' and instructions such as 'move the first verb after the subject'. The formation of question (8a) below from a corresponding sentence (8b) is consistent with a hypothesis based on linear order. Assuming children use structure independent hypotheses in grammar formation, we would expect errors like (8c) from sentences containing subordinate clauses (8d).

- (8) a. Is the man tall?
- b. The man is tall.
- c. * Is the man who - in the room is tall?
- d. The man who is in the room is tall.

The notion of structure-dependence in FLA is important because it appears that children do not use the most obvious or the 'simplest' hypotheses available to them. Crain & Nakayama (1987) adopt the analysis of Mayer, Erreich & Valian (1978) who claim that yes/no question formation can be broken down into a *copying* (of the auxiliary) and (subsequent) *deletion*. "The basic operations [of copying and deletion] are thought to be linguistic universals and...that [they] are the building blocks out of which a child constructs the transformations of a language" (p. 2).

A consequence of this treatment is that children may acquire each basic operation independently. Because errors like (8c) do not appear in child language studies, it seems that children are sensitive to hierarchical notions such as 'embedded' and 'matrix' clause. Important to this discussion is the fact that children seem to be adopting complex operations based on hierarchical structure.

Crain & Nakayama (henceforth C&N) constructed a series of elicitation tasks to test the hypothesis that children would not produce errors like (8c) in the formation of yes/no questions involving relative clauses. Thirty children divided into two groups aged 4;3 (Group 1) and 5;3 (Group 2) took part in the experiment. The task included pre-test sentences designed to ensure that their subjects could, in fact, perform yes/no question formation.

Results of the first study showed that children did not make errors like (8c). The errors the children did produce fell into three categories (See Table 1). A breakdown of C&N's results are given in Table 2.

Table 1

Error Types from Crain & Nakayama (1987)

Type I 'Prefix Errors'

* Is the boy who is watching TV is happy?

Type II 'Restart Errors'

* Is the boy who is watching TV, is he happy?

Type III 'Structure Independent Errors'

* Is the boy who - happy is watching TV?

Table 2

Correct and Incorrect Responses by Group

	Total Correct	Total Errors *	Type I	Type II	Type III	Total
Group 1	31 (38%)	50 (62%)	30 (60%)	10 (20%)	Ø	81
Group 2	70 (80%)	17 (20%)	9 (53%)	5 (29%)	Ø	87
Total	101 (60%)	67 (40%)	39 (58%)	15 (22%)	Ø	168
* Other errors: Group 1 - 10 (20%)						
Group 2 - 3 (18%)						

C&N suggest two accounts for Type I errors. Firstly, the auxiliary could have been copied from either the embedded or matrix clause. If it was copied from the former, this is clearly a structure-independent operation. Secondly, it could simply be a clause-external question marker analagous to French (i.e., *est-ce que*) or Japanese (*ka*). C&N assume that the presence of the sentence-initial *is* results from a copy-(non)deletion operation.

C&N maintain that the children's errors were due to performance factors and not lack of grammatical competence. Because they performed nearly perfectly on the pre-test sentences, C&N conclude that their subjects had the knowledge to perform the tasks. Secondly, children made the same pattern of errors across age groups which suggests that it was processing load, and not grammatical knowledge, which resulted in production errors.

The second experiment in their study investigated the possible origin of Type I errors. They used 10 subjects

from the first study who made the most Type I errors. Their hypothesis was that errors like (9) would not appear because they entail a structure-independent movement out of an embedded clause.

(9) * Can the boy who can swim is crying?

The test items in this study were constructed with different verbs in the embedded and matrix clauses. The examples, (10a & b) illustrate the alternation between *is* and the modal, *can*. Results from this task indicated what type of hypotheses (i.e., 11a - c) children use in grammar construction.

- (10) a. The boy who *can* swim *is* laughing.
- b. The boy who *is* laughing *can* swim.

- (11) a. *Structure independent hypothesis*
"Copy LEFTMOST auxiliary verb."
- b. *'Is' insertion hypothesis*
"Insert 'is' at the front of a declarative sentence."
- c. *'Copy and insert' hypothesis*
"Copy the auxiliary verb in the main clause and insert it at the beginning of a declarative sentence."

They included all ten subjects despite the fact that some of them made mistakes in the pre-test sentences. In addition, sentences like (10 a & b) produced more errors than their first experiment. They attribute this to a difference between a graphic representation in their first experiment and a verbal presentation in the second experiment.

C&N report that no errors could be traced unequivocally to the structure-independent hypothesis (i.e., 11a). Although some errors could be attributed to either (11b) or (11c), C&N maintain that neither is a structure independent operation because "they do not affect the AUX in a relative clause. We conclude, then, that the sentence processing routines of young children, as well as their grammatical hypotheses, do not violate principles of UG" (p. 536).

In a related study, Nakayama (1987) investigated what structural properties 'mask' a child's grammatical competence. The inference is that performance errors will not violate principles of UG. He systematically varied the length of test items by controlling the complexity of the noun phrase or predicate (e.g., 12 a-d) as well as the type of relative clause (e.g., 13 a & b). This was determined according to the original position of the moved *wh*-element.

(12) *Variation in sentence length*

- | | | |
|----|---|------|
| a. | The girl who is awake is sleeping. | [SS] |
| b. | The boy who is sleeping is holding a birthday present. | [SL] |
| c. | The girl who is tired of her wooden doll is crying. | [LS] |
| d. | The man who is mad at the cat is holding onto a baseball bat. | [LL] |

(13) *Relative clause type*

- | | |
|----|--|
| a. | The girl who - is eating is happy. [Subject] |
| b. | The chair the boy sat on - is new. [Object] |

Sixteen 3 to 5 year-old children participated in the experiment which consisted of a pre-test and elicitation task. Nakayama's subjects correctly produced longer

relative clauses (e.g., 12c & 12d) less often than the shorter sentences (44% and 47%, respectively). In addition, they produced fewer errors from sentences containing subject relatives than those containing object relatives (e.g., 13a & 13b; 66% and 41%, respectively).

The following ideas emerge from these two studies. Firstly, the errors which children produce appear to be circumscribed by universal principles (in this case, structure-dependence). Explanations for production errors derive from arguments which lie within a single theoretical framework (in this case, UG). Secondly, although surface structure properties such as sentence length, relative clause length and relative clause type induce production errors in young children, the errors themselves do not violate universal principles.

Background: Metalinguistic Development and Production

The studies of Crain & Nakayama (1987) and Nakayama (1987) have demonstrated that not only are children capable of producing yes/no questions from a very early age, their errors are performance-based and not 'gaps' in competence. The implication in these results is that there is a close correspondence between the emerging competence and the performance of L1 learners despite experimentally induced errors. In other words, it is not possible for children to

'know' or produce language which violates universal principles.

One of the most frequently used techniques for evaluating competence is the elicitation of metalinguistic judgements about language structure and use. (See Chaudron, 1983 for an extensive literature survey.) Research relating metalinguistic development to other areas of language development falls into two broad categories. (See Masney & d'Anglejan, 1985 and Smith & Tager-Flusberg, 1982 for more details.)

The *autonomy* hypothesis highlights the distinction between the early stages of L1 acquisition and the development of metalinguistic awareness. According to this view, important developments in speech and comprehension happen in the preschool years while metalinguistic awareness develops in the middle childhood years (approximately 7 - 8). The primary function of metalinguistic awareness is to facilitate the acquisition of writing and the learning of a second language.

In this vein, Hakes (1980) distinguishes between children's judgements of deviant and nondeviant sentences. An improvement in judging ill-formed sentences "involves an increase in children's knowledge of a number of constraints on sentence structure [whereas incorrect judgements of well-formed constructions] cannot be explained in terms of

their not yet knowing the relevant grammatical rules" (p. 79).

If one accepts the autonomy hypothesis for metalinguistic development, a number of assumptions follow. (I will focus on production rather than comprehension.) In the early stages of acquisition children will produce well-formed utterances despite their inability to make judgements based on syntactic structure. Secondly, the ability to correctly identify ill-formed constructions will improve with age.

The *interaction* hypothesis emphasizes the mutual influence between basic comprehension / production processes and the development of metalinguistic awareness. Implied in this view is the idea that metalinguistic awareness makes an important contribution to early language acquisition and that preschoolers possess some metalinguistic abilities. Clark (1978; cited in Smith & Tager-Flusberg, 1982) found that 2 and 3 year olds are capable of spontaneous language repairs - another example of metalinguistic awareness.

DeVilliers & deVilliers (1971) also found a strong relationship between the ability to correct reverse order imperatives and a common measure of early childhood acquisition (i.e., mean length of utterance or MLU). Smith & Tager-Flusberg (1982) argue for a two-way causal relationship between language development and metalinguistic

ability. They suggest that metalinguistic capacities are more extensive than previous research (e.g., Hakes, 1980) has acknowledged and that they "relate to basic language development during the preschool years" (p. 466).

If one adopts the interaction hypothesis, we expect a closer relationship between speech production and metalinguistic ability. On this view, a child should be able to identify a large number of his/her own errors in either formal experimental tasks or spontaneous self-repairs.

How does the emerging competence of children compare with that of adult L2 learners? Pre-theoretically, there is much anecdotal evidence and pedagogical experience to suggest that adult L2 learners 'know' more than they can produce spontaneously. If we were to compare production and judgement accuracy in children or adults, the results would fall into one of four logical categories as illustrated in the following matrix (See Table 3). (The idea for this type of presentation is from Schachter, 1989; cited in White, in press.)

Box (1) is characteristic of an adult native-speaker's competence and performance. That is, native-speaker performance and intuitions are, by definition, perfect and essentially uniform. Results falling into box (4) indicate that mastery over a particular structure or task is

incomplete. Given that, it is not likely that an accurate judgement is possible although Hakes (1980) suggests that there is an inherent positive bias in children's judgements when they are confronted with an unfamiliar structure.

Table 3

Production / Judgement Matrix

PRODUCTION	Right	1.	2.
	Wrong	3.	4.
		Right	Wrong
		JUDGEMENT	

If we accept the autonomy hypothesis of metalinguistic development, we might expect results for preschool children to fall into box (2). According to this view, a child is capable of producing correct forms but cannot make the correct judgements until middle childhood. The interaction hypothesis, while fundamentally different, does not rule out instances of this possibility.

It would be very surprising to find examples like this in adult L2 learning except in extreme cases of 'chunk' learning (e.g., via the Berlitz Method). White (in press) suggests that principles of UG may be so powerful that they ensure correct production. Why principles of UG would

operate in the performance domain and not the competence domain is not at all clear.

It is far more likely that comparison data for adults from production and judgement tasks would fall into box (3). That is, it seems intuitively correct to suggest that an adult can only make full use of his/her tacit knowledge under certain circumstances. It follows that judgement accuracy will be better than spontaneous speech.

Less clear, however, is whether or not the emerging competence of children falls into this category. I cannot rule it out, *a priori*, but the interaction hypothesis suggests that linguistic and metalinguistic development go 'hand in hand'. Thus it seems reasonable that comparison data would fall into box (1) assuming the child demonstrated mastery of a particular rule. With this background in mind, I conducted an empirical study with a group of adult L2 learners. The following chapter gives details and results of the study. The final chapter of this work contains the discussion and conclusions which follow from the empirical and conceptual evidence here.

CHAPTER 5

COMPARISON OF L1 AND L2 RESULTS: AN EXPERIMENT

The current study set out to investigate the following questions arising from the background issues. (a) Given equivalent tasks, do children and adults produce similar types of errors? To determine this, subjects were given an elicitation task using equivalent groups of sentences from Crain & Nakayama (1987) and Nakayama (1987). I compared the results obtained in the child studies to the adult data.

(b) What is the relationship of production errors and grammaticality judgements? Subjects were given a judgement task based on their production errors. The resulting data provided the means to compare what a learner produces and what he/she 'knows'.

The arguments presented up to this point led me to form two hypotheses: (a) Adult learners will produce a much broader range of systematic errors, none of which will violate principles of UG. (b) Adult learners' judgements will be better than their production. That is, a learner may spontaneously produce a certain systematic error but he/she will correctly judge it in a grammaticality judgement task (cf. box 3; Table 3).

Method

Subjects.

Fourteen male Arabic speakers from Libya took part in this study. Subjects were between the ages of 26 and 35. Five men had been in Canada for four months; the remaining nine for two months. All subjects were enrolled in petroleum-related technology courses at a local technical college. In addition, they received supplementary English classes to improve their reading, writing and study skills.

There is English language instruction at the junior and senior high school level in Libya. I do not consider this a confounding factor for two reasons. Firstly, courses are taught by non-native speakers so it is likely that Arabic is the language of the classroom. Secondly, students focus on grammar and translation. While this may appear to introduce bias into the study, I feel confident that enough time (minimum 7 years) has elapsed to negate the effects of formal instruction.

None of the the subjects had received extensive English training although all (allegedly) had TOEFL scores of 400 or more. (My qualifying remarks on proficiency are based on performance in areas unrelated to this study.) None of the subjects had recently received explicit instruction on the formation of yes/no questions. After extensive informal observation of spontaneous production, it was apparent that

the experimental task would produce a sufficient number of errors.

Materials.

Production task. The set of test items for the production task combined certain variables taken from the studies of C&N and Nakayama (1987). In order to replicate the test for structure-dependence, I included sentences with different verbs in the embedded and matrix clauses. To systematically increase the processing load, I varied the sentences according to length (See Table 4). Unlike Nakayama, I did not investigate the effect of relative clause or predicate length. However, I included sentences differentiated according to relative clause type.

Table 4

Sentence Length

	Words	Syllables
Short (S)	8	9
Medium (M)	12	14
Long (L)	16	19

The total set of test items was broken into four groups of sentences. Simple (i.e., mono-clausal) sentences made up two of the sets: the Syntax Test and Distractors. The other two sets contained complex sentences controlled for length and relative clause type. A short description and examples of each group follow. For a complete list, see Appendix 1.

Eight short (as defined here) mono-clausal sentences made up the *Syntax Test* (e.g., The man with the ball is the

captain.). These were included to ensure that subjects were actually able to form yes/no questions.

Group 1 sentences contained fifteen subject-relative sentences varied according to length. Five sentences had the auxiliary, *is*, in both the embedded and matrix clauses (e.g., The girl who is smiling is a friend.). In addition, there were five pairs of sentences in which the *is* - *can* pattern was alternated in both the embedded and matrix clauses (14 a & b).

- (14) a. The boy who is smiling can run fast.
 b. The boy who can run fast is smiling.

Group 2 consisted of sentences with object relatives controlled for length (e.g., The toy the girl broke - is lying under the new white chair.). *Distractors* were also yes/no questions but ones which require 'do' insertion. These sentences were controlled for length (e.g., John and Susan walk to work every day.).

Table 5

Summary of Production Test Items

Group	# Items	Length	Variable
Syntax Test	8	S	N/A
Group 1	15	S M L	(modal)-is-(modal) + length
Group 2	4	S M L	Object relatives + length
Distractors	8	S M	N/A

Judgement Task. The judgement task was made up of 120 items. In order to eliminate bias, test items were counterbalanced for (a) declaratives and questions and (b)

well-formed and ill-formed constructions. The judgement Syntax Test consisted of 20 monoclausal items: five declaratives, five ill-formed declaratives, five questions and five ill-formed questions.

- (15) a. Peter is in front of the old house.
b. * Peter in front of the old house.
c. Is Peter in front of the old house?
d. * Did Peter is in front of the old house?

All well-formed versions of Group 1 and 2 production sentences as well as their question counterparts were included (36 items).

Twenty five ill-formed questions originated from the systematic errors taken from the production task. In order to balance the set of items, twenty-five distractor sentences were also included. These were chosen because they violate abstract syntactic principles.

To achieve a balance between well-formed and ill-formed structures, seven well-formed distractor declaratives and corresponding questions were included. See Appendix 2 for a complete list.

Table 6

Summary of Judgement Task Items

	Well-formed	Ill-formed	Total
Declaratives	5 Syntax 15 Group 1 3 Group 2 7 Distractors	5 Syntax 25 Distractors	60
Questions	5 Syntax 15 Group 1 3 Group 2 7 Distractors	5 Syntax 25 Production errors	60
Total	60 Well-formed	60 Ill-formed	

Procedure.

In the production task, subjects were required to convert (orally) 35 declarative sentences into yes/no questions. In the judgement task, subjects were asked to judge 120 items according to whether they were 'good' or 'bad' English. I used a language lab to gather both production and judgement data.

Production Task. Before the production task, subjects received detailed instructions on how to complete the requirements. Once ready, they heard a sentence twice through their headsets. They had ten seconds to record their answers onto tape. All tape machines were controlled from the main console, so the subjects were not distracted. I transcribed each individual's responses according to the following scheme.

Table 7

*Evaluation Guide for Production Task**Correct forms*

C1	Possible minor errors.
C2	Declarative sentence with intonation.
CR	Reduction to one clause.

Errors

E1	'Is'-Insertion.
E2	Embedded auxiliary omission.
E3	Matrix & embedded auxiliary omission.
MX	Unclassified error.
NR	No response.
NC	Not completed.

Judgement Task. The main difficulty with judgement tasks is establishing the notion of grammaticality. For this group I discussed at length the concepts of 'good' and 'bad' English. I emphasized that the experiment was not a grammar test because they would not have time to think about rules. We explored the idea by going through a series of examples (see below). I asked them to concentrate on how the item 'sounded'.

- (16) a. We like to go fishing in the morning.
b. What time does the bus leave?
c. * John went to the store book.
d. * When Susan went to the store?

Subjects heard a test item once. They had approximately three seconds to respond by circling 'good' or 'bad' on an answer sheet. I encouraged them to mark an answer even if they were not sure. After a lengthy coffee

break, they repeated a reverse-order version of the task. This was included as a reliability measure.

Results

I will report the results in two sections. Firstly, I examine the types of errors the subjects made in the production task. As predicted, adults produced different types of systematic errors. There is strong evidence for transfer of L1 syntactic patterns onto the production of L2 constructions. However, there is no conclusive evidence against structure-independent operations in L2 production.

In the second section, I will look at a statistical analysis comparing production accuracy with accuracy on the judgement task. As hypothesized, it appears that L2 learner's judgements are more accurate than their production. There is some indication that an L2 learner's intuition does not have the same characteristics as the metalinguistic awareness of children.

Error types: Frequency and qualitative analysis.

Although the subjects in this study made many different kinds of errors, I will focus on three main systematic types which occurred throughout (See Table 8). E1 errors are identical to C&N's Type I error; E2 and E3 errors have no equivalent counterpart in their study. Seventy-five percent

of all errors (See Table 9) were of the variety shown in Table 8.

Table 8

Error types

- | | |
|----|---|
| E1 | <i>'Is'-Insertion</i> |
| | * Is the boy who is smiling can run fast? |
| E2 | <i>Embedded auxiliary omission</i> |
| | * Is the girl - who standing is sick? |
| E3 | <i>Matrix and embedded auxiliary omission</i> |
| | * Is the boy who - smiling - the captain? |

Recall that C&N divided their subjects into two groups according to age. As I have already argued, this is not appropriate for adults. However, in order to increase comparability of the two studies, I divided the adult group according to their score on the Syntax Test. Group 1 scored under seven ($\bar{X} = 4$); Group 2 consists of subjects who scored seven or better out of eight ($\bar{X} = 7.75$). The difference in accuracy scores was significant ($t(13) = 3.97$, $p < .005$). Below is a breakdown of errors from the experimental task according to the two groups (See Table 9). (For a breakdown of individual errors, see Appendix 3.) A more detailed discussion of each error type follows.

Table 9

Correct and Incorrect Responses by Group

	Total Correct	Total Errors *	E1	E2	E3	Total
Group 1	14 (10%)	75 (56%)	32 (44%)	14 (19%)	5 (7%)	133 **
Group 2	52 (38%)	62 (46%)	29 (48%)	9 (15%)	14 (23%)	134
Total	66 (25%)	137 (51%)	61 (45%)	23 (17%)	19 (14%)	267 ***

* Other errors: Group 1 - 24 (33%)
Group 2 - 10 (16%)

** Excluding one unintelligible response.

*** NR /NC responses: Group 1 - 44 (34%)
Group 2 - 20 (15%)

E1 errors ('Is' Insertion). In all examples taken from the corpus of data the subjects are inserting the auxiliary, *is*, at the beginning of a declarative sentence. This pattern is evident in mono-clausal sentences (e.g., 17a), complex sentences with *is* and the modal, *can*, in both matrix and embedded clauses (e.g., 17a-e) and sentences with an object relative (e.g., 17f). (I have edited out errors which are not relevant here.)

- (17) a. * Is Sue is lying in front of the house?
b. * Is the man who is laughing is the boss?
c. * Is the girl who is dancing can play drums?
d. * Is the boy who can run fast is swimming?
e. * Is the man who is talking to the tall woman
can dance well?
f. * Is the book the girl read after her long
illness is quite good?

It is worth noting that this type of error was also the most frequent in the child studies of C&N and Nakayama

(1987). Using the copy-deletion analysis of Mayer, Erreich & Valian (1978), they reasoned that there would be no instance of the embedded verb marking the question (e.g., * Can the boy who - run fast is swimming?).

Because they found no errors of this kind, they concluded that the structure-dependence of L1 grammar formation was verified. The same line of reasoning is open for the adult data but there is a better explanation.

Both English and Arabic² permit question formation with rising intonation on a declarative sentence. "Declarative and yes/no interrogative sentences [in Arabic] differ only in intonation" (Jelinek, 1983, p. 23).

The subject and predicate of an Arabic sentence may be inverted but, unlike English, this operation does not necessarily mark a question. For example, the sentences below only become questions with the appropriate intonation contour.

² Because of limited access to native-speaking informants and the fact that Arabic has many dialects, it was not always possible to draw examples from Standard Arabic. Non-standard examples are: Libyan Arabic (20a & b) and Egyptian Arabic (18a & b; 23 a - d).

- (18) a. *l -i9laawa malyaani.*³
 the-jar full
 The jar is full.
- b. *kaan 9ali 9askari.*
 was Ali policeman
 Ali was a policeman.

More significantly, Arabic also makes use of an interrogative particle, *hal* (Shaikh, 1978; Ziadeh & Winder, 1957). It is inserted at the beginning of a declarative sentence if there is no other interrogative in the sentence (e.g., in a *wh*-question).

- (19) a. *enta xayyaat.*
 you tailor
 You are a tailor.
- b. *hal enta xayyaat?*
 Q
 Are you a tailor?
- (20) a. *a -rajul-u taweel fi-beet.*
 the-man -NOM tall in-house
 The tall man is in the house.
- b. *hal a-rajul-u taweel fi-beet?*
 Q
 Is the tall man in the house?

A comparison of Arabic and English yes/no question formation is summarized in Table 10.

³ The transcription of Arabic here is slightly non-standard due to mechanical limitations. 9, is a voiced pharyngeal fricative; ʔ, is a glottal stop; ʕ, is voiced pharyngeal stop; x, is a voiceless velar fricative. Velarized or 'emphatic' consonants have (.) below.

Table 10

English & Arabic Yes/No Question Formation

	English	Arabic
Intonation	Yes	Yes
Inversion	Yes	No
Question particle	No	Yes

Thus, it would appear that UG theory (embodied in a copy-deletion analysis) correctly predicts the results in this study. That is, based on similar argumentation from the child language studies, we can infer that UG guarantees structure-dependence in L2 production. However, given the facts about Arabic, there is also a distinct possibility that the influence of UG comes 'via' L1. In other words, the facts of Arabic question formation indicate that E1 errors could come just as easily from a direct transfer of Arabic syntactic patterns 'onto' English question formation.

E2 errors (Omission of embedded clause auxiliary). It is evident from the examples below that these errors pose a dilemma for the structure-dependence hypothesis of grammar formation. Note that the auxiliary verbs in the embedded clause are missing in all cases.

- (21) a. * Is the girl who - smiling is a friend?
b. * Is the man who - laughing is the boss?
c. * Is the boy who - run fast is smiling?
d. * Is the boy who - smiling can run fast?
e. * Is the girl who - dancing can play drums?

Unlike C&N's study, appealing to the tenets of UG does not work. In fact, these errors are clear violations of structure-dependence because an element from a nested (i.e., embedded) clause has been moved (or deleted). We are forced to look elsewhere for an account.

A possible explanation lies in the general nature of Arabic sentence structure. The basic word order of Arabic is VSO (Bakir, 1980; Obeidat, 1983). This pattern is generally referred to as the *verbal* sentence. (The following examples are taken from Bakir, 1980).

- (22) a. *raʔa muʃtafaa 'iisaa.* [VSO]
saw Mustafa Isa
Mustafa saw Isa.
- b. *raʔa-t laylaa muusaa.* [VSO]
saw -Fsing Layla Musa
- c. *raʔa-t muusaa laylaa.* [VOS]
Layla saw Musa.

Another common Arabic independent clause is referred to as the *nominal* construction. This type of clause may be introduced by a noun (or pronoun) followed by a predicate which may or may not include a verb. (I am grateful to Dr. N. Kinberg for his assistance.) The following examples (taken from Bakir, 1980 and Jelinek, 1983) illustrate the

major types of nominal constructions. In particular, notice the absence of the verb *be* in (23d).

- (23) a. *9ali 9askari.* [NP NP]
 Ali policeman
 Ali is a policeman.
- b. *9ali za9laan.* [NP Adjective]
 angry
 Ali is angry.
- c. *9ali fil-beet dil-wa't.* [NP Locative]
 in -the-house now
 Ali is at home now.
- d. *9ali biyiktib.* [NP Pres.Part]
 bi-IMPF-3Msing-write
 Ali is writing.

Given this brief sketch, it seems reasonable to hypothesize that *is* in the embedded clauses of (21a & b) is omitted because it is not necessary in Arabic. These errors may be, in fact, a variation of E1 errors. On this view, the missing embedded auxiliary is due to interference from syntactic patterns in Arabic.

This explanation is slightly less attractive when we consider the missing modal, *can*, in (21c). Arabic has a full paradigm for *can* construction (Shaikh, 1978, p. 53), so it is unlikely that its omission is analagous to the omission of *is* (cf. the examples in (23)). The examples (21d & e) are even more problematic because the source of *is* cannot be the matrix clause.

A clearer understanding of the nature and source of these errors requires further investigation. Nevertheless, it is worth noting that this kind of error did not appear in

the child studies of C&N or Nakayama (1987). Production of E2 (Type III) errors in FLA would be crucial counterevidence against the structure-dependence hypothesis. In contrast to C&N, I find it impossible, on the basis of data collected in this study, to claim support for UG constraints on production.

E3 errors (Omission of both matrix and embedded verbs).

The status of this pattern is less certain than the previous two. Consistent with comparable structures in Arabic, the auxiliary is omitted in the embedded clause (24a & b) when there is a present participle form (cf. 23d). As with the E2 error (21c) cited above, the embedded modal, *can*, is missing.

- (24) a. * Is the boy who - smiling - run fast?
b. * Can the man who - talking to the woman -
dance well?
c. * Is the man who - dance well - talking to the
tall woman?
d. * Is the boy who - run fast - smiling?
e. * Can the girl who - play drums - dancing?

There is only one example of the kind of error found in (24e). I cannot attach too much importance to a single example, but it is noteworthy that such a clear case of extraction (or movement) from the embedded clause should happen at all. I am not aware of any corresponding constructions in Arabic upon which I could build a case for transfer.

One way of looking at this group of data is that it represents a 'hybrid' of English and Arabic question formation. That is, along with previously mentioned aspects of Arabic structure, the omission (or movement) of the matrix clause verb is consistent with the facts of English.

Were this a longitudinal study it might be possible to claim that these data represent a developmental stage. For subsequent stages, we could anticipate a decline in Arabic influence and more accurate English constructions. However, I can make no such claim for this data set.

Production and judgement accuracy.

E-Type Errors. Subjects did not make a distinction between E-type errors in the judgement task. That is, there was no significant effect for error type as revealed in a one way analysis of variance (ANOVA). A *post-hoc* analysis revealed no significant difference between error types. Table 11 gives the mean accuracy values for E-type errors.

Table 11

Mean Accuracy for E-Type Errors

	E1	E2	E3
Mean	.389	.295	.270
s.d.	.428	.439	.253
n=10			

This result is consistent with the hypothesis that L2 learners are not strongly influenced by principles of UG. If this were not the case, then we would have expected a

strong negative (i.e., correct) response to E2 and E3 errors. Further research into native-speaker reactions to these errors would provide interesting comparative data.

A correlational analysis between error types revealed a strong relationship between E1 and E2 errors ($r=.85$). Recall that both these types of errors result from transfer of Arabic patterns onto English, so it is perhaps not surprising to find this relationship. This supports the hypothesis that L1 provides the basis for L2 competence.

However, the correlation value can be misleading as the Figure 1 illustrates.

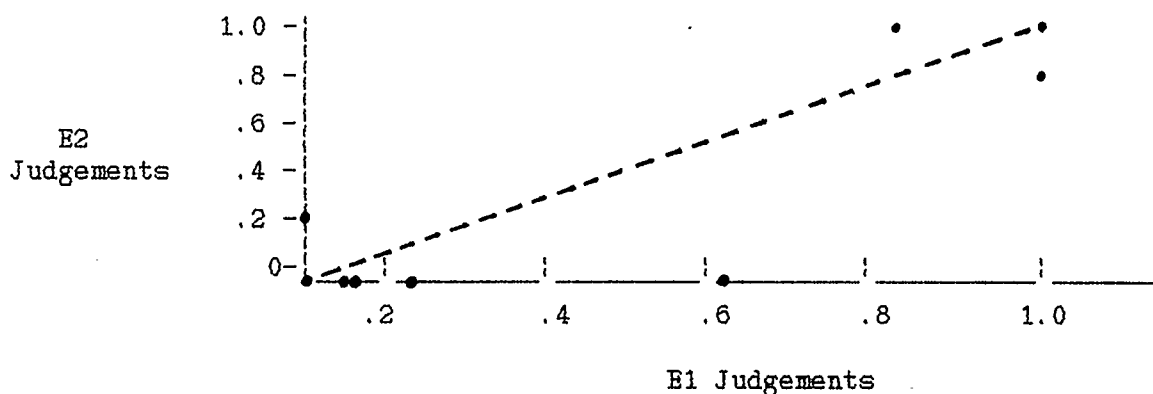


Figure 1 Correlation of E1 and E2 Judgements ($r=.85$)

Notice that there are no values between high and low scores. Therefore, the evidence is suggestive, rather than conclusive, that these subjects are basing their judgements on L1 knowledge. For the E-type errors, then, comparative data falls into box (1) or box (4) from from Table 3.

Production accuracy, judgements of well-formedness and ill-formedness. This study allows us to consider four

variables and their interaction: (a) overall production accuracy (OPA), (b) combined judgement accuracy (OJA), (c) judgement accuracy of well-formed constructions (WFJA) and (d) judgement accuracy of ill-formed constructions (IFJA). Combined judgement accuracy is a variable made up of WFJA and IFJA scores. The maximum values for all means in Table 12 is one.

Table 12

Mean Accuracy for Production and Judgement Tasks

	Accuracy			
	* OPA	OJA	WFJA	IFJA
Mean	.233	.583	.817	.350
s.d.	.205	.172	.169	.337
	* n=14	n=10		

It is immediately apparent, without any statistical analysis, that production accuracy (OPA) is very low. Firstly, it is likely that the production task presented an excessive language processing load for the subjects, despite their relatively high TOEFL scores. More specifically, factors such as length and relative-clause type may have taxed short term memory beyond its limit.

More importantly, subjects who scored low on the Syntax Test figure into the calculation for OPA. These subjects have demonstrated that they do not know how to form simple yes/no questions. Consequently, an artificially low OPA measure results from poor performance on the complex test.

It is also clear that OJA is much better than OPA.

Stated another way, L2 learners appear to 'know' more than they are capable of producing. A one-tailed, paired t -test revealed a high level of significance between these two means, ($t(9)=7.285$, $p<.001$). This observation accords with the experiences of many second language teachers and learners.

Using a combined measure for judgement accuracy is intuitively correct and methodologically sound for a global picture. However, in this case it obscures the disparity between judgements of well-formedness (WFJA) and ill-formedness (IFJA) evident in Table 12. The subject group had a great deal of difficulty identifying ill-formed constructions ($\bar{X} = .35$). In contrast, they correctly identified more than three-quarters of the well-formed items ($\bar{X} = .817$). A one-tailed paired t -test showed that this difference is significant ($t(9)=3.615$, $p<.005$).

Another point to consider is why there is such a discrepancy between the adult's ability to produce correct forms and their judgements of well-formedness. A one-tailed, paired t -test revealed a significant difference ($t(9)=7.938$, $p<.001$) between OPA and WFJA. One explanation is that there was a strong positive response bias resulting from uncertainty. A perfect score on the task would have resulted from marking 50% of the items 'good' and 50% as

'bad'. Overall, subjects responded 'good' 56.3% of the time. This represents a slight positive bias of 6.3%.

A tentative conclusion is that an L2 learner will consider an unknown structure to be well-formed in the absence of disconfirming information. Nevertheless, I believe it is safe to assume that this group was able to judge well-formed sentences better than they were able to produce them under limited-time conditions. As hypothesized, this comparative data falls into box (3) from Table 3.

Another one-tailed, paired *t*-test showed no significant difference between OPA and IFJA. If that is the case, then OPA and the ability to correctly identify ill-formed structures are comparable tasks. A correlational analysis shows that there is a moderately close correspondence between the individual ranking on both tasks ($r=.634$).

Until now, I have been looking at the performance of the entire group. As I have already mentioned, this includes subjects who scored poorly on the Syntax Test. I was interested in finding out if the relationships discussed above changed with performance level.

Proficiency, as it is defined here, has two levels. The other main factor, task, has two levels: production (OPA) and judgement. The latter is made up of WFJA and IFJA.

If proficiency is a factor in the relationship between production and judgement tasks, I expected to find an interaction effect. I used a 2 X 3 analysis of variance (Group X Task). The nature of ANOVA allows a measure of the interaction effect between the two main factors, group and task. Table 13 contains the basic information relevant to the analysis.

Table 13

Mean Accuracy According to Group and Task.

		Accuracy		
		OPA	WFJA	IFJA
Group 1 (n = 6)	Mean	.103	.777	.170
	s.d.	.118	.185	.171
Group 2 (n = 4)	Mean	.373	.876	.620
	s.d.	.186	.144	.180

An inability to manipulate the simple sentences in the Syntax Test (i.e., Group 1) results in very poor scores for the experimental task. On the other hand, near perfect scores on the Syntax Test (i.e., Group 2) do not guarantee a high accuracy level for the complex sentences. We can surmise that the production task provided a challenge to all subjects.

By plotting these values on a graph (as in Figure 2 below) it is immediately obvious that Group 2 performed at a higher level than Group 1. In addition, the prediction that IFJA would rise with proficiency is borne out by the data. The ANOVA revealed a significant main effect for proficiency

groupings ($F(1)=20.576$, $p<.01$) and a main effect for task ($F(2)=20.859$, $p<.001$). There was no significant interaction effect between the main factors. Thus, it seems that even though proficiency level rises, the relationship between production and accuracy does not. A further ANOVA revealed a significant main effect for task between the accuracy means for OPA and WFJA ($F(1)=81.834$, $p<.001$), but no significant difference between OPA and IFJA.

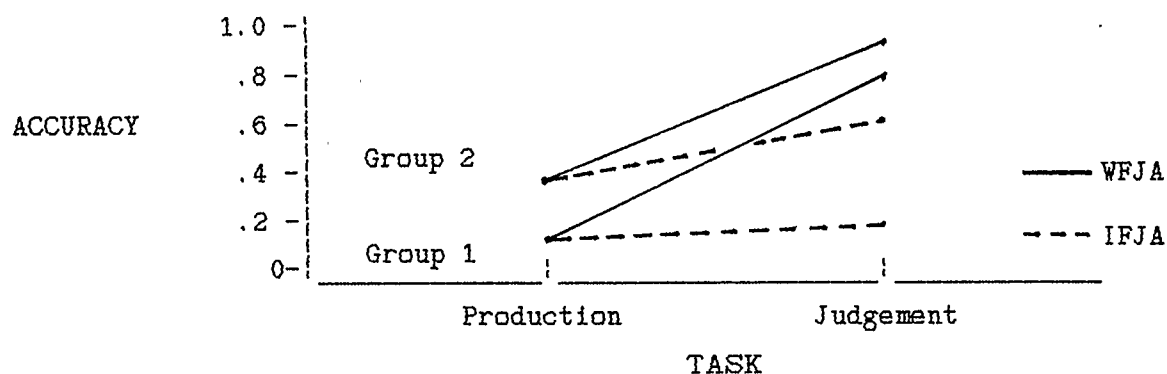


Figure 2 Comparative Accuracy of Production and Judgement by Groups

If we use the data matrix from Table 3, it appears that the majority of results fall into box (3). That is, these adult learners are more accurate on a judgement task than a production task. The fact that production accuracy is more closely related to the ability to judge deviant structures places comparative data in either box (1) or box (4).

Summary

An analysis of production errors indicates that adult L2 learners were relying on L1 structural patterns to

complete a yes/no question formation task. Although this accounts, in part, for their low production accuracy, the results are very different from the findings of Crain & Nakayama (1987) and Nakayama (1987) in a number of important ways.

Firstly, this adult group produced a qualitatively different set of systematic errors than the group of children. Secondly, E1 (Type I) errors have more than one explanation, unlike the child studies. For the adults, a language transfer account is as plausible as a UG-based account. Lastly, the adult group produced errors that forced explanations outside the theory of UG.

Subjects did not score well on apparent violations of structure-dependence (i.e., E2 errors). I have argued that E1 and E2 errors reflect Arabic syntax in a straightforward manner and so it seems reasonable that they would not consider them to be ill-formed.

In addition, accuracy on a grammaticality judgement task seems to be better than production accuracy over a range of equivalent structures regardless of proficiency level. For reasons that are not yet clear, the internalized grammatical knowledge of these subjects appears better suited to judging the grammaticality of well-formed structures than to producing correct forms.

The results also support the claim that overall proficiency is comparable to accuracy of ill-formedness judgements. In the last chapter, I will discuss these findings and their implication for further research.

CHAPTER 6

FOUNDATIONS OF L2 KNOWLEDGE

The results from this study bear directly on the question of what it means to know a second language and, in particular, the nature of that knowledge. Two main findings emerged:

(a) Adults produce structures which differ qualitatively from those of children under similar circumstances. This production appears to violate a principle of UG (i.e., structure-dependence).

(b) Consistent with the experiences of many language students and teachers, adult L2 learners appear to know more than they can produce spontaneously. This stands in contrast to the developing metalinguistic abilities of children.

In the following sections I will discuss the consequences of these findings for an explanatory theory of second language acquisition.

The Nature of L2 Competence

The role of L1.

The adults in this study not only produced errors which seemed to violate the principle of structure-dependence, but, as a group, they did not recognize (i.e., judge as incorrect) violations of this principle in the judgement task. If structure-dependence is a universal characteristic

of grammar formation, then how can we account for this contradiction beyond appealing to L1 interference?

As I have already stated, it appears that L1 acts as a kind of barrier to L2 grammar formation. This suggests that, in some cases, linguistic properties of L1 'block' the effect of universal principles. This view is consistent with a parameter setting model of SLL (e.g., Flynn, 1987a, 1987b; White, 1986, 1987) with one important difference.

Structure-dependence is considered to be a 'pure' (i.e., exceptionless) universal because all human languages have hierarchical, as opposed to linear, structure. The adults in this study were not violating structure-dependence from the standpoint of Arabic even though the results in English resemble violations of UG. It appears, then, that structure-dependence in SLL depends on the point of reference.

It seems clear from this discussion that structure-dependence is 'fixed' by experience. If this is the case, then these data suggest the possibility of a structure-dependence parameter of UG. The evidence for this principle in English is that children do not produce sentences which require verb movement out of an embedded clause. Apparently, this evidence would not be found in Arabic children because Arabic embedded clauses have a different internal structure.

An implication of this argument is that a large component of emerging L2 competence is based on the tacit knowledge of L1, **not** UG. Most of the structural information which adults begin with adheres, in theory, to universal principles specified according to a parameterized version of UG (i.e., L1). Thus, an adult starts with internalized grammatical knowledge (i.e., L2 competence) which is often inaccurate.

The nature of L2 learner intuitions.

Up until now, I have not defined the term, *internalize* because I believe it has an intuitive meaning not far removed from its intention here. Internalized knowledge is (somehow) represented in the mind in such a way that it is accessible without conscious thought. (Bialystok, 1979, 1982 explores this idea in depth.) For example, native speakers often use language without 'paying attention' to how they are using it. For my purposes here, internalized knowledge is that information which can be used spontaneously and without reflection.

Corder (1972) has argued that any descriptively adequate theory of L2 grammar formation must accord with the learner's intuitions of his/her internalized linguistic knowledge (i.e., interlanguage). This position borrows heavily on the assumptions underlying UG theory and the

stance that first and second language acquisition are essentially similar processes.

Parallels between the metalinguistic capacities of children and adults partially support this view. A learner's ability to judge ill-formed constructions provides the most accurate measure of his/her internalized grammatical knowledge. This finding is consistent with the view of parameter setting and the internalization of linguistic rules entailed in UG theory.

The information from this study seems to verify some L1 research which states that competence is made up of two discrete abilities: judgements of well-formedness and judgements of ill-formedness. These, in theory, converge to form a unified mental state as proficiency increases.

Consistent with the autonomy hypothesis of metalinguistic development (e.g., Hakes, 1980), adults are able to judge nondeviant sentences better than deviant ones. As with children, adult's ability to correctly judge deviant sentences increases with proficiency. Hakes attributes children's increased ability to judge deviant sentences correctly to a decreased tendency to use semantic criteria for judging well-formedness.

The error analysis suggests that L2 learners use structural information not only for production purposes but for judgement tasks as well. Unfortunately, the study does

not allow us to determine if adults are using less semantic information to determine ill-formedness conditions. The question must remain open.

The members of this group have knowledge that they are not capable of using within the time limitations of the task. This contrasts with a number of findings in the FLA domain. For example, a maturational model of UG (e.g., Felix, 1984) maintains that children's grammar is optimal for the principles available at a particular time. This implies that children make full use of their grammatical knowledge. The interaction hypothesis for metalinguistic development makes a similar claim by stressing the interrelatedness of linguistic and metalinguistic development. This does not appear to be the case with adults.

Another possibility is that children produce language better than the state of their grammar allows. That is, they may produce unanalyzed 'chunks' of language. This is consistent with an autonomy hypothesis of metalinguistic development.

Gleitman & Gleitman (1979) argue that a child's production of syntactic form actually precedes their ability to judge grammaticality on the basis of structural considerations. DeVilliers & deVilliers (1974) reach a similar conclusion: "We cannot attribute tacit knowledge of

[a given structure] until the child can recognize violations of that rule and show by his corrections that the basis for his judgement is [structural knowledge]" (p. 21).

Bowey (1986) compared measurements of spontaneous and deliberate corrections of grammatical sentences in a large group of children ranging in age from 4;0 to 10;0. Incorporating typical errors from the production of children, she constructed two sets of equivalent, ill-formed sentences. She compared subjects' success at repeating deviant sentences without correction (spontaneous repair) to their ability to locate and correct errors in similar sentences (deliberate correction).

Generally, her results showed that performance on the imitation task was better than the correction task. In particular, she found that younger children made the most spontaneous repairs but were the least successful at correcting ill-formed sentences. In other words, their production was actually more accurate than their ability to isolate and correct syntactic deviance.

In a follow-up study, she compared young (4;0) children's ability to repeat deviant and nondeviant sentences. She was interested in determining if her subjects produced the kinds of errors she had incorporated into the ill-formed sentences.

In fact, she found that her subjects spontaneously corrected 19% of the errors in the repetition of ill-formed sentences while accurately imitating the majority of the well-formed sentences. Thus, the production accuracy was high. She concludes that the "poor syntactic awareness of nursery school children cannot be attributed to lack of familiarity with the structures tested" (p. 302).

The relation between adult's production accuracy and their ability to judge grammaticality does not fit neatly into explanations found in the FLA literature. According to this body of research, comparative data for children would appear to fall into box (2) found in Table 3. That is, it is possible for children to produce correct forms without the ability to judge them correctly. As children's linguistic ability improves, there is a closer correspondence between their production and metalinguistic intuitions. Using Table 3, one can trace this development: *Box (4) --> (2) --> (1).*

This does not appear to characterize the situation for adult L2 learners. The results from this study suggest that L2 learner's grammatical knowledge is not always available to them. This corresponds to box (3) in Table 3. Thus, the relationship between L2 competence and production can fall into boxes (1), (3) or (4). It is not possible to posit a

developmental progression as I did for children because L2 learners frequently have 'gaps' in their knowledge.

Final Considerations

It appears that a transitional L2 competence is quite different from the emerging L1 competence although it is not surprising to find commonalities between natural languages (i.e., L1 and interlanguage). However, at stake is how well a purely linguistic theory can capture the facts of SLL. I have shown that UG provides a precise explanation of FLA but that it is unsatisfactory for SLL because the two processes differ in fundamental ways.

Even though UG may play a general and limited role in SLL, the specific assumptions underlying UG theory do not apply to adult second language learning. However, it would be a mistake to interpret this view as a denial of shared characteristics. As Felix (1987) has stated,

If it is a general and biologically determined property of the human mind to be able to acquire natural language on the basis of limited input, then there is no *a priori* reason to expect that this ability should regularly decline at a specific age (p. 140, original italics).

Felix's point is well taken. Obviously, we are capable of learning another language at any time in our lives. Neither is there any evidence to suggest that the

'biologically determined property of mind' has somehow lost its original *characteristics*. It is also true that second language learners acquire tacit knowledge of a target language that may, on the surface, resemble a native speaker's. And yet, it seems clear that the 'biologically determined property of mind' does not perform exactly the same *role* as it does in children.

The research documented here leads me to some tentative conclusions about the nature of the differences between FLA and SLL. Firstly, second language learners do not internalize linguistic knowledge in the same way as first language acquirers.

Second language learning theories do not address the central question of how linguistic knowledge becomes internalized. The situation in FLA research is not much better although a theory of parameter setting entails the notion of internalization in L1 acquisition. I am not aware of any specific claims in this area but I am suggesting that when a specific parameter is 'fixed' according to experience, the knowledge it captures is (somehow) internalized. Given certain facts of adult second language learning (e.g., fossilization), it is difficult to see how a theory of parameter setting can achieve the same explanatory force for L2 internalization.

Assume, for the sake of argument, that a function-specific cognitive faculty for internalization exists in much the same modular fashion as the language faculty. (For convenience, I will label the internalization faculty, *IF*.) In the early years of life, the *IF* is primarily oriented to processing linguistic information. During the course of L1 acquisition, there is a strong interaction between the language and internalization faculties. In this scenario, parameter setting refers to the 'action' of the *IF*.

As demands on mental processes increase during the course of maturation (e.g., school), the language-specific function of the *IF* is not required as much and it becomes more generalized. By the time the child reaches puberty, the generalization process is complete such that linguistic information is treated like all other kinds of information. Naturally, the interaction between faculties does not stop, but generalization of the *IF* operations has made the interaction less efficient.

If the internalization of L2 learners is less efficient than for children, the results from the adult study are not surprising. Adults can gather the information they need for language learning. However, gathering information does not guarantee the ability to use it spontaneously and correctly.

Metaphorically, it is as if L2 knowledge is stored and only slowly 'absorbed' (i.e., internalized).

Not only is L2 knowledge internalized less efficiently, the nature of that knowledge is fundamentally different for L2 learners in that it does not reflect principles of UG directly. Given that, I expect that the rule system upon which learners rely would be far more complex than that posited for children. (Clahsen & Muysken, 1985 have found this.)

Second language grammars reflect an amalgamation of L1 structural information, misgeneralizations and false hypotheses as well as partial UG effects, positive transfer and lucky guesses. This picture is quite different than the precise elegance of UG theory.

If this reasoning is correct, then it has implications in the area of second language teaching methodology. Second language pedagogy is often based on the assumption that replicating the 'naturalistic' environment and communicative conditions of L1 acquisition (as far as possible) facilitates the language learning process for adults. This may be true for independent reasons, but it is unlikely that any teaching method has any significant effect on how language is internalized or how L2 grammars are formed.

The view which I have argued for here is that L1, as an instantiation of UG, acts as a 'barrier' to adults learning

a second language. This has certain consequences for the formation and internalization of an L2 grammar. The evolution of the earth's crust provides a metaphor for first language acquisition process. As the earth cooled, the outer layers formed a hard 'skin'. In the same way, first language 'hardens' around the 'core' of UG. Any subsequent language must be 'built' on first language although 'cracks' in the hard layer of L1 will occasionally permit UG to directly affect the SLL process.

In conclusion, the perspective which has emerged from this investigation is that second language research may provide valuable insights into the nature of UG. However, differences in the initial states, the internalization processes and the final attainments between children and adults prevent the theory from becoming an explanatorily adequate theory of second language learning.

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APPENDIX 1

Production Test Items

Syntax Test

- 1.S The man with the ball is the captain.
- 2.S Peter is in front of the old house.
- 3.S Sue is the captain of the best team.
- 4.S The toy is in front of the table.
- 5.S John is talking to the tall old man.
- 6.S Sue is lying in front of the house.
- 7.S The girl with the white hat is dancing.
- 8.S The old book is in the yellow car.

Group 1

- 9.1 The girl who is smiling is a friend.
- 10.1 The man who is laughing is the boss.
- 11.1 The boy who is smiling can run fast.
- 12.1 The girl who is dancing can play drums.
- 13.1 The boy who can run fast is smiling.
- 14.1 The girl who can play drums is dancing.
- 15.1 The girl who is smiling is watching a show with her friend.
- 16.1 The girl who is standing in front of the bookstore is sick.
- 17.1 The boy who is swimming can run faster than his good friend.
- 18.1 The boy who can run faster than his good friend is swimming.
- 19.1 The man who can dance well is talking to the tall woman.
- 20.1 The man who is talking to the tall woman can dance well.
- 21.1 The boy who is the captain of the football team can run much faster than me.
- 22.1 The boy who can run much faster than me is the captain of the football team.
- 23.1 The woman who is mad at her best friend is leaving the party with that man.

Group 2

- 24.2 The ball the young girl kicked - is yellow.
- 25.2 The toy the girl broke - is lying under the new white chair.
- 26.2 The book the girl read - after her long illness is quite good.
- 27.2 The car the woman bought - for her next vacation is in front of the old house.

Distractors

- 28.D John and Susan walk to work every day.
- 29.D They plan to visit the house next week.
- 30.D John always brings good food to the show.
- 31.D John watched a very good movie last night.
- 32.D John wants to visit France next year for a long summer trip.
- 33.D Sue likes to wear her mother's old hats and dresses to work.
- 34.D Mary takes the bus to high school if she has enough time.
- 35.D They listen to good music when they want to go to sleep.

APPENDIX 2

CORRECT FORMS

Syntax Test

- 1.S Peter is in front of the old house.
- 2.S Sue is the captain of the best team.
- 3.S John is talking to the old man.
- 4.S The girl with the white hat is dancing.
- 5.S The old book is in the yellow car.
- 6.S Is Peter in front of the old house?
- 7.S Is the toy in front of the table?
- 8.S Is John talking to the old man?
- 9.S Is the girl with the white hat dancing?
- 10.S Is the old book in the yellow car?

Group 1

- 11.1 The girl who is smiling is a friend.
- 12.1 The man who is laughing is the boss.
- 13.1 The boy who is smiling can run fast.
- 14.1 The girl who is dancing can play drums.
- 15.1 The boy who can run fast is smiling.
- 16.1 The girl who can play drums is dancing.
- 17.1 Is the girl who is smiling a friend?
- 18.1 Is the man who is laughing the boss?
- 19.1 Can the boy who is smiling run fast?
- 20.1 Can the girl who is dancing play drums?
- 21.1 Is the boy who can run fast smiling?
- 22.1 Is the girl who can play drums dancing?
- 23.1 The boy who is swimming can run faster than his good friend.
- 24.1 The boy who can run faster than his good friend is swimming.
- 25.1 The boy who is captain of the football team can run much faster than me.

Group 1 (cont'd)

- 26.1 The man who is talking to the tall woman can dance well.
- 27.1 The man who can dance well is talking to the tall woman.
- 28.1 The boy who can run much faster than me is the captain of the football team.
- 29.1 Can the boy who is swimming run faster than his good friend?
- 30.1 Is the boy who can run faster than his good friend swimming?
- 31.1 Can the boy who is captain of the football team run much faster than me?
- 32.1 Can the man who is talking to the tall woman dance well?
- 33.1 Is the man who can dance well talking to the tall woman?
- 34.1 Is the boy who can run much faster than me the captain of the football team?
- 35.1 The girl who is smiling is watching a show with her friend.
- 36.1 The girl who is standing in front of the bookstore is sick.
- 37.1 The woman who is mad at her best friend is leaving the party with that man.
- 38.1 Is the girl who is smiling watching a show with her friend?
- 39.1 Is the girl who is standing in front of the store sick?
- 40.1 Is the woman who is mad at her best friend leaving the party with that man?

Group 2

- 41.2 The ball the young girl kicked is yellow.
- 42.2 The toy the girl broke is lying under the new white chair.
- 43.2 The book the girl read after her long illness is quite good.

Group 2 (cont'd)

- 44.2 Is the ball the young girl kicked yellow?
45.2 Is the toy the girl broke lying under the new white chair?
46.2 Is the book the girl read after her long illness quite good?

Distractors

- 47.D Susan went to see a doctor yesterday.
48.D John swims every morning.
49.D They like swimming in the summer.
50.D Sue studies French after work.
51.D My mother's birthday is tomorrow.
52.D Peter is planning to buy a new house.
53.D We saw a very good movie last night.

54.D Where did Susan go yesterday?
55.D What does John do every morning?
56.D When do they go swimming?
57.D Who studies French after work?
58.D When is your mother's birthday?
59.D When will Peter buy his new house?
60.D Did you like the movie last night?

INCORRECT FORMS*Syntax Test*

- 61.S Peter in front of the old house.
62.S The toy in front of the table.
63.S John talking to the old man.
64.S The girl with the white hat dancing.
65.S The old book in the yellow car.

66.S Did Peter is in front of the house?
67.S Is it the toy in front of the table?
68.S Does John talking to the old man?
69.S Is the girl is with the white hat dancing?
70.S Is it the old book in the yellow car?

E1 Errors

- 71.E1 Is the girl who is smiling is a friend?
72.E1 Is the boy who is smiling can run fast?
73.E1 Is the girl who can play drums is dancing?
74.E1 Is the boy who is swimming can run faster than his good friend?
75.E1 Is the boy who can run faster than his good friend is swimming?
76.E1 Is the boy who is captain of the football team can run much faster than me?
77.E1 Is the man who is talking to the tall woman can dance well?
78.E1 Is the man who can dance well is talking to the tall woman?
79.E1 Is the boy who can run much faster than me is the captain of the football team?
80.E1 Is the girl who is standing in front of the bookstore is sick?
81.E1 Is the woman who is mad at her best friend is leaving the party with that man?
82.E1 Is the ball the young girl kicked is yellow?
83.E1 Is the toy the girl broke is lying under the new white chair?
84.E1 Is the book the girl read after her long illness is quite good?

E2 Errors

- 85.E2 Is the man who laughing is the boss?
86.E2 Is the girl who dancing can play drums?
87.E2 Is the boy who swimming can run faster than his good friend?
88.E2 Is the man who talking to the tall woman can dance well?
89.E2 Is the boy who captain of the football team can run much faster than me?

E3 Errors

- 90.E3 Is the girl who smiling a friend?
91.E3 Can the girl who dancing play drums?
92.E3 Can the boy who run fast smiling?
93.E3 Can the man who talking to the tall woman dance well?
94.E3 Is the man who dance well talking to the tall woman?
95.E3 Is the girl who smiling watching a show with her friend?

Distractors

- 96.D John put in the car.
97.D Susan took of Mary.
98.D Mary sent to her good friend.
99.D He likes to listen radio.
100.D She sleeps a bed.
101.D He travelled to from Paris.
102.D Peter travelled to London from.
103.D He is looking for someone who to help him.
104.D He is looking for something which to do.
105.D He is looking for someone who to talk to.
106.D I told that I was leaving to my mother.
107.D I am looking for a man for to fix my TV.
108.D He asked me if she gone.
109.D John is necessary for to leave.
110.D Susan seems is happy.
111.D Mary seems John to like.
112.D We expect for him to win.
113.D Susan tried for Mary to come home early.
114.D John said for Mary to have left.
115.D Mary said John to have left.
116.D Peter said for to have left.
117.D Mary said to have left.
118.D He tried for to come home early.

Distractors (cont'd)

119.D Mary wrote a book about.

120.D They expect for to win.

APPENDIX 3

Number of Error types by Individuals

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
E1	Ø	1	4	5	2	3	5	12	4	8	9	1	6	1	61
E2	5	2	Ø	3	Ø	2	7	1	1	Ø	Ø	1	1	Ø	23
E3	2	2	Ø	2	7	2	Ø	Ø	1	Ø	Ø	Ø	2	1	19
Other	Ø	7	3	4	1	4	2	Ø	2	5	2	2	2	Ø	34
NR/NC	4	1	2	1	3	3	5	Ø	12	5	5	15	5	3	64

* One Unintelligible
Response (S11)