Morris, Beth Kaplan

VARIABLES AFFECTING THE LEARNING OF ASPECTS OF POLYNESIAN BY ENGLISH - SPEAKING SCHOOL CHILDREN UNDER EXPERIMENTAL CONDITIONS

City University of New York PH.D. 1983

VARIABLES AFFECTING THE LEARNING OF ASPECTS OF POLYNESIAN BY ENGLISH - SPEAKING SCHOOL CHILDREN UNDER EXPERIMENTAL CONDITIONS

by

Beth K. Morris

A dissertation submitted to the Graduate Faculty in Speech and Hearing Sciences in partial fulfillment of the requirements for the degree of Doctor of Philosophy, the City University of New York.

1983

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

April 29, 1983
date

Arthur J. Bronstein
Chairman of Examining Committee

4/29/83
date

Katherine S Harris
(Acting Executive Officer, for Irving Hoberg)
Executive Officer

Professor Arthur J. Bronstein

Professor Herbert W. Seliger

Professor William Stewart

Professor Harvey Nadler (outside reader)
Supervisory Committee

The City University of New York

Abstract

VARIABLES AFFECTING THE LEARNING OF ASPECTS OF POLYNESIAN BY ENGLISH - SPEAKING SCHOOL CHILDREN UNDER EXPERIMENTAL CONDITIONS

by

Beth K. Morris

Adviser: Professor Louis J. Gerstman

The concept of a post-pubertal decline in language learning ability has often been associated with observed deficiencies in the acquisition/ learning of non-native languages in adulthood. Such hypothetical limitations on adult L_2 learning may be referred to as the "Age-Effect."

This study investigated syntactic and semantic aspects of the Age-Effect. It was limited to the initial stage(s) of L_2 learning where the capacity of pre- vs. post-pubertal children to learn a limited set of lexical concepts in a novel language (Hawaiian) was explored under experimentally controlled conditions. The potential age-related discontinuity in performance in Hawaiian was measured against other variables deemed to affect L_2 learning.

Subject variables, apart from age, investigated included: 1) sex, 2) reading level and academic standing in L_1 (English), 3) presence or absence of a bi/ multi-lingual background, 4) attitude toward foreign language learning and toward the target language used in the study, and 5) socio-economic factors.

Task variables investigated included: 1) linguistic set (differential performance in syntactic vs. semantic subtests), 2) response type (tasks that were 'easier' and 'more difficult,' requiring linguistic and metalinguistic decisions), and 3) interference factors from $L_1 \longrightarrow L_2$.

The relationship of these nine variables, including AGE, to immediate vs. long-term recall of learned information in the target language was assessed under test/ re-test conditions. The outcome of this study was a specification of the relative contribution(s) of each of the above-named factors to L_2 performance when the variables were counterposed against one another.

Two-hundred twenty students in the New Rochelle and White Plains Public Schools in Westchester County, New York, were selected for treatment: 72 fourth graders, 83 seventh and eighth graders, 53 eleventh graders, and 12 ninth-grade Latin students.

The instructional materials consisted of a 48-frame "comic-book" which was accompanied by an audio-cassette tape recording of the Hawaiian story. The comic-book was equally divided between syntactic and semantic lexical concepts to be investigated:
Part I - the transitive vs. stative verb contrast (syntax),
Part II - the locative "i" vs. "ma" contrast (semantic).

The response materials consisted of a 28-item, pencil and paper test, divided into three parts- fourteen Multiple-Choice

items (7 syntactic; 7 semantic); seven (syntactic) Anagrams and seven (semantic) Error-Detection items. Test items were presented in hierarchical "sets" by level of difficulty and each of the three parts also contained items designed to elicit specific kinds of $L_1 \longrightarrow L_2$ interference errors.

Demographic information was collected through a student Questionnaire.

Subjects' test responses were subjected to a series of two-tailed t-tests which indicated a statistically significant advantage for the two older groups over the fourth graders. Particularly noteworthy was the superior performance of the junior high school subjects tested.

Within the linguistic/ task variables, pair-wise t-tests revealed that the Syntactic-Anagrams task was ("unexpectedly") easy for all subjects, while the Semantic-Error Detection task was ("expectedly") more difficult. In addition, older subjects evidenced a consistently higher proportion of correct syntactic responses on the multiple choice task, while younger subjects evidenced a consistently lower proportion of semantic multiple-choice errors.

Within the age-groups, multiple regression analyses indicated a solid core of L_1-related proficiencies and school/ academic factors (Reading Class, Reading Level, School (foreign) Language Study, School Language Use over time) which consistently predicted test-score performance; for all three age groups across

test/ post-test conditions. Overall gain in performance at the second session, however, was best predicted by the first week's performance.

These finding suggest that there are a multiplicity of factors impinging upon the successful, or unsuccessful, learning of a non-native language, and that AGE alone cannot account for such variations in child L_2 performance.

To the memory of

my beloved father,

David G. Kaplan

"I'm just a living legacy to the leader of the band."

---Dan Fogelberg

ACKNOWLEDGEMENTS

A first-order debt of gratitude must be given to Professor Louis J. Gerstman who never gave up on me, nor this study, despite the heavy burdens imposed upon him in the course of its development and execution. He taught me 'how to make science,' and how to laugh at my mistakes.

I wish to extend my deepest appreciation, too, to the members of my Dissertation Committee; Professors Arthur J. Bronstein, Herbert W. Seliger and William Stewart- all of whom made unique, invaluable contributions, under in-human time pressures, to the design and implementation of this study and to the interpretation of its results. Likewise, I offer a special note of thanks to Professor Harvey Nadler for lending his expertise and insights about second language learners to the final draft of this dissertation.

I must also acknowledge the cooperation of the administrators and teachers of the White Plains and New Rochelle public-school systems: Dr. La Ruth Gray, former Deputy Superintendent of the New Rochelle Public Schools, Mr. J. Greenberg, Chairman of English, Albert Leonard, J.H.S., Ms. R. Dillon, Mrs. Gottlick, Ms. J. Matthews, and Mr. Santoriello of the teaching staff of Albert Leonard J.H.S.; Dr. William Hughes, Deputy Superintendent of the White Plains Public Schools, Mr. H. Jefferson, Assistant Principal of White Plains H.S., Mr. Windbiel of the White Plains H.S. faculty, and the administrators and staff of the

Mamaroneck Avenue School in White Plains- Mr. R. Walters, Principal, Mr. M. Rosenberg, Assistant Principal, and the fourth grade teachers, Ms. Present, Mrs. Ueberschoer, and Mr. Hanley. Without their personal assistance, efficiency and support throughout this project, I would not have had so successful an experience in administering this experiment over such a broad range of public-school children.

Words alone cannot begin to acknowledge the gratitude and love due my own family, who survived having a part-time wife, mother, and daughter for such a long time -. To my husband, Edward, my sons Kenneth, Ephraim and Louis, my mother, Fan Kaplan, and my mother-in-law, Ruth Morris, the "pregnant elephant has finally delivered!"

Over the years, some extraordinary friends have held me up when I was discouraged, and have enabled me to 'see it through-' Emily and Jack Cullen, Cecile and Michael Stein, Helaine and Hu Marshall, Carletta Aston, Helenca Kapsalis, John Klosek, Lynn Martin, and my dear friend, Renée Wehrmann. You were there when it counted, and I shall never forget it.

Finally, I wish to pay homage to the approximately 250 children who participated in this project from the pilot study on. They have humbled me, and they have taught me, as no abstract concept of "individual differences and cognitive styles" ever could, the meaning of diversity in people's approaches to language learning. As one fourth grade subject asked at the

close of this experiment, "How do you say- 'Your mother eats pineapples-' in Hawaiian?" I conclude this dissertation feeling safe that, despite the experimenter's best efforts, children already know what language is all about. . . .

Aloha aʻina!

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

THE PROBLEM

It has long been assumed that post-pubertal language learners (physiological adults) are limited in their capacity to acquire/ learn language: ". . . the facility for acquisition of speech sharply declines around puberty;" (and one may) "refer to this point simply as the . . . decline of language acquisition" (Lenneberg, 1966, p.37). Claims have been made regarding a neurophysiological and/or neuropsychological 'cut-off' for language acquisition around pubescence - the so-called Pubertal Critial Period Hypothesis (Jacobson, M., 1975; Lecours, 1975; Lenneberg, 1966). In recent years, the concept of a decline in language learning ability around puberty, with or without support from the neurophysiological accounts of the Pubertal-Critical Period Hypothesis, has been associated with observed deficiencies in second language acquisition/ learning in adults. For purposes of the present discussion, we may refer to these hypothetical limitations on L_2 acquisition/ learning in adulthood as the "Age-Effect."

The "strong" interpretation of the Age-Effect states that adults cannot achieve native-like proficiency in a foreign or second language (Seliger, 1978). Experimental support for this hypothesis comes from numerous sources. Among them are: Asher and Garcia (1969) who assessed the English pronunciation of

Cuban immigrants, aged 7-19, and found that 71% of the children who had arrived in the United States before the age of six achieved near-native pronunciation of English, while only 17% of the children age thirteen and older, equated to the younger group in length of residence in the United States, achieved accent-free pronunciation in English (pp.337-338).

Oyama (1976) found a similar relationship between accent-free pronunciation in English and early arrival in the United States among Italian-American immigrants. In her 1978 study of the same subjects, she found that those who had arrived in the United States before age eleven also evidenced more native-like speech comprehension in English than did their older-arriving counterparts (1978, p.5).

It is not clear, however, that the Age-Effect extends beyond articulatory production and/or auditory comprehension to encompass other aspects of second language learning/ acquisition. Such a limitation constitutes the "weak" interpretation of the Age-Effect. Even if younger, pre-pubertal L_2 learners achieve better pronunciation, Snow and Hoefnagel-Höhle (1978) have shown that older L_2 learners may acquire syntax and morphology better and more rapidly than their pre-pubertal counterparts, and Weber-Olsen and Ruder (1980) have demonstrated that adults may be more efficient learners of aspects of a non-native lexicon than children. There is also a "null" interpretation of the Age-Effect which purports that there are no essential differences

between pre- and post- pubertal language learners in terms of eventual achievement in L_2 (Burstall, 1979).

Recent explorations into L_2 acquisition and learning have questioned the validity of the Age-Effect altogether. Snow (1980), for one, has suggested that the Age-Effect may be only a "Task-Effect;" in those areas where adults out-perform children, for example, older language learners may simply do better in formal language learning and testing situations. Since researchers in second language performance have distinguished between 'acquisition' of non-native languages in naturalistic settings, and 'learning' of non-native languages in formal settings, such as the classroom or the laboratory (Fathman, 1978; Krashen, 1976), better performance on classroom-based achievement tasks in L_2, where "language is removed from a natural communicative environment and becomes instead an object of formal study" (Bialystok, 1978b, p.230), is dependent upon aspects of language learning aptitude, motivation, and cognitive maturation which favor the adult second language learner over the child second language learner (Ibid.).

Adult L_2 learners may be more efficient than children under some learning conditions because they have been 'sensitized to de-contextualize language,' and have a heightened awareness of syntactic and formal rules based upon metalinguistic capacities and skills present in adulthood (McLaughlin, 1981). It has been demonstrated, for example, that when child L_2 learners reach the

stage of 'concrete operations (in a Piagetian framework), the comprehension of syntactic aspects of both native and acquired languages "improves dramatically" (Tremaine, 1975, pp.261-262).

As subsequent chapters will reveal--apart from the confounding effect of Task-on-Age, there are several other reasons why the present state of confusion with regard to age-related limitations or assets in second language acquisition/ learning exists:

1- the co-occurrence of acquistion-performance data and learning-performance data within Age-Effect studies;

2- the over-dependence of researchers on evidence from brain-damaged populations to support various hypotheses concerning normal L_2 acquisition or learning in adulthood;

3- the use of a narrow range of age populations, insufficient to speak to the pre- vs. post-pubertal issue;

4- other factors, independent of the purported neurobiological constraints on L_2 acquisition/ learning, may better account for the observed discontinuity in language learning performance with increasing age: a) the nature of the linguistic input to children compared to adults, both in and out of the classroom, may vary (McLaughlin, 1980a and b), b) the complex interaction of cognitive development with external-environmental factors (e.g., the ". . . mature competence (of adults) in their first language which they continually use as a point of reference" (Neufeld, 1979, p.239)) has only recently been researched in the

Age-Effect literature (Seliger, 1981), and c) affective factors, such as a positive or negative attitude toward the language-learning experience and/or the target language and culture may interact significantly with age to further confound the achievement of learners in L_2 (Genesee and Hamayan, 1980).

At the present time then, essential questions regarding the nature of a child vs. adult L_2 learning/ acquisition differences remain unresolved. Specifically,-

Question 1- Are there differences in the capacity to learn a non-native language associated exclusively with the age of the L_2 learner? (the "age" issue);

Question 2- Does it matter which aspects of the non-native language we are looking at? (the "linguistic" issue);

Question 3- Does it matter what the learner's first language is? (the "interference" issue);

Question 4- Does it matter how competency in L_2 is assessed? (the "task" issue), and

Question 5- Does it matter who the L_2 learner is- apart from his/her age? (the "individual differences" issue).

Statement of the Problem

The present study will investigate the "weak" interpretation of the Age-Effect. It will be limited to the initial stage(s) of L_2 learning where the capacity of pre- vs. post-pubertal children to learn a limited set of syntactic and semantic concepts in a novel language (Hawaiian) will be studied under conditions where

time and type of exposure to the target language will be strictly controlled. The potential age-related discontinuity in performance in the target language will be measured against other variables supposed to affect L_2 performance.

Subject variables, apart from age, to be investigated include: 1) sex, 2) reading level and academic standing in L_1 (English) as indicated by grade and class placement and the results of standardized tests (specifically, the Reading Comprehension subtest of the Iowa Tests of Basic Skills), 3) presence or absence of a bilingual or multilingual language background, 4) attitude toward foreign language learning and toward the target language used in this study, and 5) socio-economic factors where pertinent.

Task variables to be investigated include: 1) the linguistic set-differential performance in syntactic vs. semantic tasks, 2) response type-test items that will consist of easy and difficult tasks that will require both linguistic and meta-linguistic decisions, and 3) interference factors- evidence of positive and negative transfer to and from target and first languages (Hawaiian and English).

The relationship, if any, of these nine variables: AGE, SEX, RESPONSE TYPE, INTERFERENCE, READING LEVEL/ACADEMIC STANDING, LINGUISTIC SET, ATTITUDE, BI/MULTILINGUALISM AND SOCIOECONOMIC FACTORS, to immediate vs. long-term recall of learned information in the target language will be assessed under test/ re-test

conditions.

The outcome of this study will be a specification of the relative importance of each of the factors cited above when counterposed against one another. There is no predetermination in the present study of how much variation in performance will be attributable to AGE per se.

Rationale and Significance of the Project

Prior researchers on the Age-Effect have concentrated, for the most part, on a limited population- the so-called 'competent bilingual' who is the end-product of the language acquisition/ learning process (Scovel, 1982). What is needed is further investigation of the language acquisition/ learning process itself in the settings where this learning is most likely to occur in the United States of America- i.e., with students, in classrooms, at various ages and stages of L_2 competency (Ervin-Tripp, 1974; Scovel, 1982).

It is in this context that the relevance of the present study for speech, language and hearing habilitation/rehabilitation specialists may be stated. Since the majority of speech, language and hearing clients, both children and adults, are treated in the formal settings of schools, university clinics, or hospital settings, the need for research on normative populations of language learners in comparable (formal) settings becomes apparent; particularly if the pitfalls inherent in adopting the

reverse procedure are to be avoided: i.e., the use of data from brain damaged populations to imply normal language functions and processes (Diller, 1981; Genesee, 1982; Scovel, 1982; Whitaker, 1981).

Some work has already been done comparing language-disordered populations to second language learners (Bruck, 1982: Kessler, 1975; Morris, 1978; Quigley and King, 1980). Although there is, at present, a small number of such comparative studies, some striking similarities in language performance between groups of second language learners and certain language disordered populations have already been uncovered, as will be detailed later on in this discussion. Quigley and King (1980), for example, studied the performance of normal hearing-monolingual adults, hearing impaired and deaf children and adults (mild to profound) and second language learners (college-level ESL students) from the United States, Canada and Australia on a Comprehensive Test of Syntactic Abilities. They found 'similar performance profiles' among all three populations tested, particularly for the moderately to profoundly deaf students (aged 10 to 19) and the college-level ESL students. These authors suggest that a canonical word-order strategy may be operating within both groups of language learners (e.g., the reversion to S-V-O patterns in both comprehension and production) such that English is perceived as "linear" rather than "hierarchial" (p.337).

Recently, theorists in second language learning and

acquisition have distinguished between "strategies" and "tactics" used in the language acquisition process (McLaughlin, 1981; Seliger, 1980). Strategies are defined as long-term processes which are universal in all language learning events. "Examples of such activities or processes would be hypothesis testing, simplification and overgeneralization". . . (Seliger, 1980, p.4). Tactics, on the other hand, are "idiosyncratic. . . short-term processes used to overcome temporary and immediate obstacles. . . to language acquisition" (Ibid., p.2). Such processes might include the use of the first language in processing the second language (particularly in the adult L_2 learner) and "memorization devices" (McLaughlin, 1981, p.26). However, Selinker (1974) considers language "transfer," defined as the conscious or unconscious reliance upon L_1 in the face of some unfamiliar or complex aspect of L_2 - to be one of the most important strategies, not tactics of second language acquisition. Unraveling the problem of whether or not (local) "interference" factors or (universal) "developmental" factors predominate in groups of child L_2 learners will be one of the core concerns of this study.

For many years, second and foreign language educators have reinterpreted the "age" issue as an "instructional" issue, involving the continued debate over the efficacy of initiating second language instruction in primary vs. secondary schools (Burstall, 1979; Lambert, 1981; Ramirez and Politzer, 1978). In

addition to the timing of L_2 instruction, the appropriateness of certain types of instructional methods for children and adults has come under increasing criticism. It has been suggested, for example, that so-called "immersion" environments that stress the communicative, "integrative" social functions of language are more conducive to second language learning in children (MacNamara, 1973) while adults benefit more from formal L_2 learning environments where instruction is centered upon "instrumental" learning for academic and employment needs (Bialystok, 1978b). Morris (1978), for example, has proposed that there may be specific instructional methods which are more facilitating for the adult language learner, whether (s)he is a normal adult acquiring a new language or an aphasic adult re-acquiring language after cerebral insult.

Recent discussions in the ESL literature, for example, have shown increasing interest in the need to supply adult language learners with "conscious" grammars of the target language (overt, explicit rules) based upon the adult's purported need for and reliance upon logico-deductive systems and formal operations (Krashen and Seliger, 1975; Krashen, 1976). Indeed, the selection of an instructional method for the present study derives from current research and/or hypotheses regarding L_2 teaching methodologies that purport to facilitate language learning among specifiable groups of L_2 learners.

This study is an attempt to address each of the issues

raised above, with special reference to those questions of concern to speech, language and hearing habilitation/rehabilitation specialists and second/ foreign language learning specialists alike. Such questions as-

1- Are there developmentally constrained language acquisition/reacquisition "heuristics" (McLaughlin, 1981, p.26) that are common to normal second language learners and to language impaired populations (e.g., the reversion to a canonical (S-V-O) word-order strategy in syntactic performance)?

2- Does prior experience with first language acquisition enhance or inhibit subsequent language acquisition- at least at the initial stages of L_2 learning- and, is "interference" itself constrained by developmental factors, such as the age or cognitive maturity of the language learner?

3- Are there specific methods of instruction, such as providing the L_2 learner with explicit rules in the target language, which will facilitate learning in certain groups of L_2 learners, but not others?

However, the rationale for this study might best be summarized by the following lines from Albert and Obler (1978):

> Language teachers often subscribe to the theory that the younger the learners are, the better they will learn a foreign language. Little systematic work, however, has been done to compare age dependent differences in learning capacities and strategies across the continuum from birth to puberty, or across that from adolescence to senescence (pp.6-7).

Within the limits of the experimental format outlined on these pages, the present research attempts to meet the challenge implied by the statement above-in the middle of this continuum. . . .

CHAPTER II

REVIEW OF THE LITERATURE

The nine independent variables presented in Chapter I of this study- Age, Sex, Response Type, Interference, Reading Level/ Academic Standing, Linguistic Set, Attitude, Bi-Multilingualism, and Socioeconomic Factors, are discussed in the Review of the Literature to follow in four major areas relevant to this investigation:

1- the Linguistic issue- to include research on the linguistic manifestations of the Age-Effect in areas other than pronunciation and auditory comprehension; specifically, morphology, syntax and semantics.

2- the Interference issue- to include evidence for and against the presence of negative and positive transfer to and from native and target languages.

3- the Task issue- to include investigations of the effect of varying methods of testing on the assessment of L_2 proficiency, particularly with regard to linguistic vs. metalinguistic performance in L_2.

4- the Individual Differences issue- to include studies which examine factors, other than subjects' age, that may account for observed variations in L_2 performance; such factors as: language aptitude, academic standing, learning environment,

attitude, sex, and language background of the L_2 learner.

Above all, the primary function of the Literature Review will be to answer the question "Can the Age-Effect be addressed independently of the factors presented in areas 1-4 above?"

1. Linguistic Studies of the Age-Effect

Age and L_2 Morpheme Acquisition

Many investigators of the Age-Effect in the 1970's concentrated upon the acquisition of grammatical morphemes in non-native languages. Snow and Hoefnagel-Höhle (1978), for example, included a Dutch adaptation of Berko's 1958 "wug test-" a nonsense word/ picture identification paradigm used to elicit obligatory morpheme changes, in their study of forty-seven English-speaking subjects of various ages acquiring Dutch as a second language in Holland. At the beginning stages of Dutch L_2 acquisition (i.e., 4-6 weeks into their initial exposure to Dutch), "The morphology test showed enormous age differences in favor of the older subjects," aged eight to adult (p.339), and most significantly for those subjects in the 12-15 year old range (Ibid.).

Snow and Hoefnagel-Höhle point out, however, that the 12-15 year olds' "advantage" in morpheme acquisition was limited to the early stages of L_2 learning since age differences on the morpheme task tended to "disappear" with longer residence in

Holland (p.342). These authors also note that the age advantage apparently did not extend to the older adults tested since they scored at or below the 12-15 year old group in morpheme acquisition at test sessions one and two- the so-called "teenage-ceiling" effect (p.340).

Fathman (1975) found a similar advantage for teenagers in L_2 morpheme acquisition beyond the initial stages of L_2 exposure described by Snow and Hofenagel-Höhle (1978). Using her own SLOPE Test (Second Language Oral Production in English), Fathman found the 11-15 year old children superior to the 6-10 year old children in morpheme acquisition when the subjects were two-hundred Korean and Spanish ESL students, age 6-16, who had lived in the United States for from one to three years.

Although Fathman and Snow and Hoefnagel-Höhle show a distinct advantage for older-aged L_2 learners in morpheme acquisition, other morpheme studies, in which the second language was English, have shown similar performance profiles across older and younger aged subjects tested. This Literature Review will consider six such studies.

In an oral-elicitation test called the Bilingual Syntax Measure or BSM, Dulay and Burt (1978) tested young ESL learners between six and eight years of age (60 Spanish children; 55 Chinese children) on the acquisition of eleven grammatical functors in English. Their results indicated that the order of

acquisition was virtually identical for both groups of children, with pronoun case ranking first (easiest) in the sequence, and third person singular s/es ranking last or near last in order of difficulty.

Bailey, Madden and Krashen (1978) found that while difficulty orders for eight of the fourteen morphemes tested by Dulay and Burt (1974a and b) did not correlate significantly with results of first-language developmental studies of English, they did correlate significantly with the results obtained on the BSM by seventy-three adult ESL learners, aged 17-55, from a variety of L_1 backgrounds. Bailey et al's results suggest a "common order of acquisition for functors in adults. . . (p.368) quite similar to the relative accuracies shown by children learning English as a second language for the same functors, . . ." (p.369). However, agreement among the adult subjects as to the relative difficulty ordering of these eight morphemes was not uniform. One group's performance, those subjects in the third level of a four-level ESL program, did not correlate significantly with the function-word accuracy reported for the other subject groups tested (Table 23-2, p.367). Bailey et al explain this quirk in the data as a possible ". . . ceiling effect caused by a high level of English language proficiency in this group" (p.365).

Some researchers have questioned whether the regularities cited in the morpheme acquisition studies described above are not simply artifacts of the instruments used to assess morpheme

accuracy (Fathman, 1978, discussion notes). In an effort to discover if, indeed, the "natural order" found in prior morpheme acquisition studies was ". . . tied to the use of a particular elicitation device or technique" (Krashen, Houck, Giunchi, Bode, Birnbaum and Strei, 1977, p.339), spontaneous oral performance data were collected from twenty-two intermediate level adult, university ESL students from a number of L_1 backgrounds. The presence or absence of eight of the BSM's grammatical morphemes in obligatory contexts was assessed with "striking results:" (p.340) "Both relative and absolute orders (of the eight morphemes" were ". . . very close to the Bailey, Madden and Krashen (1974) study" and agreement with other studies on the rank-order of difficulty of the morphemes was also high (Ibid.).

Larsen-Freeman (1975) assessed ten of the eleven grammatical functors studied by Dulay and Burt (1974a and b) using four different tasks (reading, writing, listening and imitation) in addition to the BSM, in order to determine whether the commonality of results evidenced in prior ESL morpheme acquisition studies was due to ". . . the underlying complexity of the morphemes--not how they (were) learned through the exercise of a particular skill nor how they (were) manifested through a particular modality" (pp.411-412). Her subjects were twenty-four adult, university-level ESL learners from four different L_1 backgrounds. Larsen-Freeman's results indicated that the imitation-task orderings did correlate significantly with the order found by

Dulay and Burt (1974a and b) for children, and with her own administration of the BSM for the adult ESL learners she tested. There was no such significant correlation, however, between Dulay and Burt's results and the other three tasks used by Larsen-Freeman, who also found a great deal of individual and cross-language variation in the performance of these latter three tasks; particularly in the reading test (Table 6, p.416).

Anderson (1978) collected data on the use of fourteen grammatical morphemes in the written compositions of eighty-nine Spanish-speaking 17-19 year old students in their first major ESL course at the University of Puerto Rico. He calculated individual as well as group performance scores for these subjects, and included a breakdown of the morphemes by category-bound vs. free; verb phrase vs. noun phrase. Anderson's results showed that "In spite of differences in methodology, the agreement between the results of this study and Krashen's Natural Order (1977) is significant" (pp.265-266), leading Anderson to conclude that the "systematicity is apparently in the nature of L_2 (English). . . not in the interaction with L_1" (p.265); nor in the methodology used to assess L_2 morpheme acquisition.

Thus it seems that, for the most part, older-is-better for the rapid acquisition of grammatical morphemes in a second language; especially if the older L_2 learner is within the 11-15 year old age range. However, there is one reservation attached to this generalization. Although Anderson's (1978) work repre-

sents an admirable attempt to reconcile the methodological conflicts evident in prior morpheme acquisition studies, he warns future researchers not to underestimate the potential for "variability" in second language learning; sources of variability which might include 1) the effects of positive and negative transfer from L_1 to L_2, and 2) "the possible contribution of different degrees of phonological, semantic and syntactic complexity. . . in L_2" (p.274). We have already seen some of this "potential for variability" in several of the morpheme studies previously cited, including a) the confounding effects of high levels of academic proficiency in L_2 on morpheme acquisition (Bailey, Madden and Krashen, 1978) and b) the influence of "task" on the assessment of L_2 performance (Larsen-Freeman, 1975). Indeed, we shall see that this "potential for variability" is even stronger when the researcher attempts to assess child vs. adult differences in syntactic performance in a second language.

Age and L_2 Syntactic Acquisition

In contrast to the regularities observed in the studies of acquisition of grammatical morphemes in a second language, the study of syntactic performance in a second language is clouded by several factors which diminish the researcher's ability to make strong claims relating age to L_2 syntactic acquisition/ learning.

Before exploring these 'complicating' factors, however, it is important to note that there is some clear evidence that older-is-better for syntax, too.

Ramirez and Politzer (1978) used a picture verification task to assess both comprehension and production of fourteen grammatical and semantic contrasts in English. Their subjects were forty-three Spanish/English kindergarten through fifth grade children enrolled in a bilingual public school program, and twenty-one junior and senior high-school students in their first and second years of an ESL immersion program in the United States of America. Like Snow and Hoefnagel-Höhle's (1978) results for morpheme acquisition, Ramirez and Politzer found a significant advantage of junior high school students over kindergarten children who were at a parallel stage of L_2 acquisition (i.e., three to four months into their formal exposure to ESL in school) in the following syntactic categories: noun-verb agreement, negation, pronoun agreement, direct object/ indirect object reversal, and word-order change (p.321). The advantage of the older children was even more pronounced in the production/ imitation task where, the authors surmised, the short-term memory capacities of the older ESL students would give them an "obvious advantage" in the production task (pp.325-326).

A comparison of the junior and senior high school subjects with first graders indicated that "the bilingual school children

appear(ed) to have reached the same level as the two groups of adolescents in most categories" (p.326), although there was still a significant advantage of high schoolers over first graders (both groups in their second year of formal ESL instruction) in some syntactic categories such as agent/ patient reversal and word order change. In replication of Snow and Hoefnagel-Höhle's (1978) findings, however, the age advantage in syntax tended to diminish with increased exposure to English. By the time bilingual subjects had reached grade five, for example, all the significant differences in test-score results were in favor of the fifth graders over the junior high and high school subjects, with some exceptions- direct object/ indirect object reversal and agent/ patient reversal continued to present problems for the *younger-aged children* (p.376).

Ramirez and Politzer go on to discuss what was, for them, a "surprising" finding- they found almost no differences in test-score performance between their junior high school and high school age subjects, even though the high school students had received approximately one year more exposure to English than the junior high school group (p.317). The authors describe this phenomenon as a "total levelling off for the high school subjects" (p.331). This seems quite reminiscent of the "teenage ceiling effect" encountered by Snow and Hoefnagel-Höhle (1978) in their older L_2 learners.

The "teenage-ceiling effect" represents the first of the

'complicating factors' we will encounter in the assessment of L_2 syntactic performance, since it suggests the possibility of individual characteristics, other than the subject's age, playing a role in the outcome of L_2 proficiency tests- in this case, the subject's motivation and attitude toward the test (?), toward the target language and culture (?), etc... More will be said about the "teenage--ceiling effect" later on in this study. In the next part of this review, we shall see socio-economic factors 'complicating' the outcome of another attempt to assess syntactic proficiency in a second language.

In a measure of syntactic comprehension in which thirty-one children between the ages of four and nine living in Geneva, Switzerland, "acted out" constructions such as passives, actives, indirect objects, and "telegraphic sentences" like- "box open boy" (Ervin Tripp, 1974, pp.113-114) in both L_1 (English) and L_2 (French), Susan Ervin-Tripp found the nine year-olds superior to the younger children in almost every task in French syntax, ". . . including a child in Geneva for only six months" (p.124). The rapid acquisition of even complex grammatical structures by the eight to nine year old children studied by Ervin-Tripp supports the older-is-better-for-morphology-and-syntax positions of Snow and Hoefnagel-Höhle (1978) and Ramirez and Politzer (1978); at least for the initial stages of L_2 learning. (Ervin-Tripp's subjects were tested within nine months of their first exposure to French in school.) However, Ervin-Tripp suggests

that the rapid and successful acquisition of L_2 syntax in her older subjects may have been due to factors outside of their age-related linguistic maturity in L_1 and L_2: "these subjects," she notes, "are in no sense a random sample of second language learners; the social circumstances were such that English speakers in Geneva are unusually well-educated, and those who chose to send their children to French schools. . . tend to be almost entirely professionals" (p.113).

Using Fathman's SLOPE test, Krashen, Sferlazza, Feldman and Fathman (1976) assessed the syntactic performance of sixty-six adults from four groups of first-language backgrounds-Spanish, Greek, other Indo-European languages, and non-Indo-European languages. Their results showed "no significant differences" among the language groups in test score results; nor were there any significant differences in performance attributable to the amount of exposure (formal or informal) to English (p.149). Acknowledging the possible influence of method of testing on the results of this study, however, Krashen et al readministered the SLOPE test in written-response form to a sub-group of these subjects and, indeed, witnessed some significant changes in the difficulty orders found under the former oral-production condition. Among the grammatical morphemes, for example, third-person singular s/es ". . . jumped from the bottom of the rank order to eight (out of twenty)" (p.150), leading these researchers to suggest that ". . . the format of the testing

procedure must be considered when interpreting difficulty order or order of acquisition" (Ibid., p.150).

So far, we have seen two instances (Larsen-Freeman, 1975; Krashen, Sferlazza, Feldman, and Fathman, 1976) in which mode of testing has 'complicated' the interpretation of second language research. The confounding effect of "task" on the outcome of syntactic performance tests in L_2 is nowhere more evident than in Snow and Hofenagel-Höhle's (1978) study of Dutch L_2 acquisition. Here, syntactic performance was measured by: a) a sentence-repetition task, b) a sentence judgment task, and c) a sentence translation task,- from English into Dutch. Although results on these three subtests conformed to the results of the morpheme task previously described (i.e., the older 12-15 year old teen-agers significantly out-performed the adults who, in turn, "slightly" out-performed the eight-to-ten year old children on all three tasks at test-session one), it is apparent that the 'metalinguistic awareness' needed to engage in activities such as grammaticality judgment and paraphrasing (translation), along with the short-term memory capacities required for successful participation in the sentence repetition task, inherently prejudiced the findings in favor of the older children and adults. As DeVilliers and DeVilliers (1979) suggest- "Metalinguistic awareness comes many months or even years after the child appears to use such rules in his own speech and in understanding others" (p.169).

Bever (1981), reviewing Oyama's 1976 research on Italian-American bilinguals, presents a similar point of view with regard to second language acquisition; i.e., although there were "significant correlations between age-of-arrival and the measures of accent, comprehension, and recognition of syntactic errors" which Oyama examined (p.194)- earlier arrival time in the United States yielding better performance on measures of English language proficiency, "(t)here was no correlation with the ability to detect ambiguities or to decode the semantic relations of short noun phrases" (Ibid.). Bever concludes that "The more abstract tasks involving a high degree of linguistic awareness are not related to the age at which the second language was started" (p.195).

Bever's conclusions are in sharp contrast to Patkowski's 1980 study of sixty-seven American immigrants. Patkowski's findings indicate a significant correlation between measures of syntactic performance based on oral transcript ratings and results of a written, multiple choice "Linguistic Intuitions Test" which required a) recognition of grammaticality, b) identification of underlying syntactic relationships, and c) recognition of paraphrases (p.75). Success on both linguistic and meta-linguistic measures correlated significantly with the age of arrival of the subjects in the United States, supporting a younger-is-better- (i.e., pre-pubertal arrival into the United States) for-syntax hypothesis (Table 8, p.103).

It should be recalled, however, that Patkowski's subjects were required to be enrolled in college, college graduates, and/or in professional positions normally requiring a college degree (p.64). In this regard, we are reminded of Ervin-Tripp's (1974) comments with respect to the atypicality of her subject base (Op. Cit., p.23), and Snow's (1980) comment that the so-called "teenage-ceiling" effect did not apply to the ". . . chronological adults" she tested who were "functioning as students in the universities of Holland. . ." These subjects were above the 12-15 year old group in all measures taken" (1980, discussion notes).

In considering these studies of the linguistic manifestations of the Age-Effect re: syntactic acquisition in L_2, it soon became apparent that regularities in the data which support 'younger-is-better' or 'older-is-better' hypotheses are seriously compromised by the experimenter's disregard of the separate and collective effects of method of assessment, academic standing of the subjects, socio-economic factors, negative or positive transfer from L_1, attitude or motivation of the language learner, etc.. It is also important to note that when these variables are permitted to enter into the analyses of the Age-Effect, results often change dramatically (e.g., Krashen, et al, 1976). In the last part of this review of the linguistic manifestations of the Age-Effect, we shall return to a more settled picture of the relationship between age and lexico-semantic acquisition in a second language,

where, like the morpheme studies previously cited, older-is-(apparently)- better.

Age and L_2 Lexico-Semantic Acquisition

Few studies have attempted to separate syntactic from semantic aspects of lexical acquisition in a second language. Weber-Olsen and Ruder (1980) studied the acquisition of the semantic domains of four Japanese locatives by twenty monolingual speakers of American English; ten 4-5 year old children and ten adults, aged 23-28. Their task consisted of a two-phased training and testing procedure in which the four locatives were taught through the examiner's manipulation of objects representing the various locative relationships (e.g., a doll placed on a container, etc.). By phase II of the training task, subjects were asked to respond spontaneously with the Japanese locative that correctly matched each of the examiner's object manipulations, until a criterion of 22 out of 24 correct responses over two consecutive sessions was attained. Weber-Olsen and Ruder's results indicated that the adults out-performed the children significantly in both sessions I and II (with the exception of one locative in the post-test) and that "with very few exceptions, adults demonstrated nearly complete generalization of four locatives. . . after only six trial exposures to each word" (p.193).

Among Ramirez and Politzer's (1978) "categories" of ESL assessment, four were related to semantic contrasts: three pronoun districtions, and the contrast between "at" and "for" in verb phrases. Parallel to their findings with respect to syntax, results in the semantic categories indicated a superiority of junior high school and high school-aged subjects over the kindergarten and first grade groups in all four semantic categories. Indeed, the superiority of the older subjects was seen to continue significantly in several of these semantic categories though grade 5 (e.g., junior high and high students > grade 5 students in the "to look at" vs. "to look for" distinction), even though the syntactic superiority of the older children had been virtually erased (p.327). Ramirez and Politzer speculate that a ". . . more fully developed ability to handle some difficult semantic distinctions in L_1 (may) account for the relative superiority (of the older subjects on these tasks)" (pp.330-331).

In reviewing these prior studies related to linguistic demonstrations of the Age-Effect, the following observations may be stated :

First- a unilateral or "strong" interpretation of the Age-Effect is not possible; at least not at the current stage of L_2 acquisition/ learning research. We have seen, for example, that older-may-be-better for lexico-semantic concepts, and (possibly) for grammatical morphemes, but the picture with regard to L_2

syntax and "age" is unclear. Whatever research is done on the Age-Effect in future studies, therefore, separate considerations of oral production, auditory discrimination and comprehension, morphemics, syntax and semantics, etc., may be required. Indeed, further breakdowns within each of these macro-linguistic categories might be needed (e.g., separation of the semantic and syntactic functions of prepositions in L_2) in order to define which specific linguistic subsets of L_2 are sensitive to age differences and which are not.

Second- Other factors, quite independent of the L_2 learner's age, may have a stronger influence on the out-come of performance measures in L_2 than was previously acknowledged. With regard to syntax, for example, language researchers must enterain the possibility that different methods of assessment may favor the cognitive capacities of different groups of L_2 learners, outside of linguistic and/or age considerations. In the next part of this Literature Review, we shall consider several of these important, non-age/linguistic influences on second language learning, beginning with the role of the first language in acquiring the second.

2. The Interference Issue - L_1/L_2 Relations

Albert and Obler (1978) define interference as ". . . the unintentional usage of one language in the course of using the

other" (p.12). These authors go on to suggest that interference may be 'selective' in that it may occur "differently at different linguistic levels (at the 'sentence level,' the 'phrase level,' the 'lexical level,' or the 'phonemic level,' " (p.16) and that it may "even affect various word classes differently" (p.17). Interference may be further constrained by the age and/or learning stage of the second language learner (Ibid., p.21).

There has been much discussion over the extent to which child language acquisition or learning is influenced by such interference factors. In examining the results of the BSM, for example, Dulay and Burt (1974a) distinguished 513 'errors' in the speech of the 179 (bilingual) Spanish-speaking children, aged 5-8, they tested: "Only 4.7% of the errors- 24 out of the 513. . . unambiguously reflected native Spanish interference (while) 87.1% of the errors- 447 out of 513- reflected the same developmental structures used by children learning English as a first language" (p.132).

Similar results have been found for English-speaking children learning French (Ervin-Tripp, 1974; Tremaine, 1975); for English speaking children learning Hebrew (Rosenbaum and Obler, cited in Albert and Obler, 1978); for Italian American bilingual children (Kessler, 1971), and for German and Japanese children learning English as a second language (Morsbach, 1981). A closer look at some of these studies, however, reveals that

interference phenomena are in evidence, even among the very young L_2 learners investigated.

Morsbach (1981) notes that while her study of the comprehension of fifteen grammatical structures in English by ten to thirteen year-old German and Japanese children replicates prior research on child language acquisition which shows strong developmental similarities between L_1 and L_2, interference errors were still evident in her results (p.188). For example, the future tense was "more difficult for the Japanese pupils (13th rank) than for the German pupils (95th rank)," which, Morsbach suggests, "might be due to the fact that there is virtually no future tense in Japanese" (Ibid.).

Ervin-Tripp (1974) has speculated that the complexity of semantic or syntactic concepts in L_2 will determine the extent to which children will rely on L_1 structures in the acquisition of L_2 (p.121). She cites two examples- one from her own study, and another from the work of one of her student's- which indicate that the youngest L_2 learners relied more on word-for-word translations than their older counterparts. For example, English to French translations such as, "Who is she waiting for? Qui elle attend pour?" (Ervin-Tripp, 1974, p.120) reflected an "inability on the part of the younger subjects to apply the French verb-subject inversion rules" (Ibid.), and Hebrew to English translations such as "Is it he is singing a song? Do I am going to be a fortune teller?" (Milgrom, cited in Ervin-Tripp, 1974, p.122)

gave evidence of a Hebrew". . . Y/N interrogation morpheme that is sentence initial (whereby) children create a syntactic class of preposed auxiliaries, rather than (apply) the model of (English) tag questions" (Ibid., p.122).

Among the studies of interference in adult second language learning, Janet Anderson (1978) found evidence for both negative and positive transfer in the written multiple-choice and translation tests she administered to 180 Spanish-speaking university students enrolled in English classes in Puerto Rico (pp.92, 101). With regard to sentential complementation for example, positive transfer from L_1 to L_2 produced fewer errors where 1:1 lexical equivalents were available; e.g., when Spanish is L_1 and English, L_2- "the task of producing a <u>that</u> (italics) complement is less difficult when the stimulus sentence contains a <u>que</u> (italics) complement" (p.99).

Larsen-Freeman (1978b) investigated the acquisition of ten grammatical morphemes by twenty-four adult ESL students whose first languages were Arabic, Japanese, Persian and Spanish. Her findings confirmed nine out of thirteen "predictions" of interference from L_1 to L_2 based on prior contrastive analyses of the four first languages (p.129). However, a readministration of the same test (BSM) two months later confirmed only six of the thirteen transfer predictions, leading Larsen-Freeman to suggest that the effect of $L_1 \longrightarrow L_2$ interference may be short-lived.

Snow (1981), in a qualitative re-analysis of her data for English speakers acquiring Dutch (specifically, the sentence translation task designed to assess the acquisition of Dutch syntax) found a "general pattern of similarity" (p.248) in the errors made by both child and adult groups tested. According to Snow, some of the errors found in the responses of all of the English-speaking subjects, such as word order reversals of time and place adverbials, "have never been noted in native speakers" (Ibid.) and could therefore be classified as true interference-type errors. Other errors could be classified as 'developmental,' in the sense of Dulay and Burt's (1974a and b) definition, in that they were "typical of young native Dutch speakers" (p.250).

Zobl (1980a and b) has argued strongly for a synthesis of 'developmental' and 'transfer' strategies in L_2 acquisition and learning. He suggests that "structurally compatible" languages will conform to developmental regularities common to both languages (e.g., Kessler's 1971 findings for Italian-American bilingual children). However, Zobl (1980a) further suggests that when the native and target languages have no structural correspondence, or when the "common rule schemata are asynchronic" (p.477), L_1 will have a "retarding effect on the restructuring" of L_2, producing negative interference (Ibid.).

A non-traditional approach to interference is the "competition model" proposed by Bates and MacWhinney (1981). This model predicts that where the semantic, syntactic and pragmatic aspects

of a second language converge, or "coalesce" with respect to a first language (e.g., the overlapping of pre-verbal subject in S-V-O structures with semantic agent and pragmatic topic in English), acquisition of L_2 will proceed with the fewest errors and in the fastest possible time (pp.197-199). However, when L_1 and L_2 are in "competition" with each other; i.e., when the structural and functional categories do not "coalesce," speed of L_2 acquisition will decrease while interference-type errors will increase (pp.199-200).

Preliminary results of Bates and MacWhinney's test of the Competition Hypothesis in two comprehensive experiments, where subjects were an Italian-American bilingual and four German-American bilinguals, indicated that the Italian-American used Italian strategies in processing English sentences: i.e., "strong use of animacy and agreement, much less use of word-order" (pp.206-210). On the other hand, three of the four German-English bilinguals used "German processing strategies (such as a strong reliance on agreement) to interpret English sentences" (p.206).

Although prior researchers in second language acquisition have tended to minimize the extent of an interference effect, they may have done so because they have relied on a traditional definition of "transfer" limited to structural errors, lexical borrowings, and the like (Bates and MacWhinney, 1981, p.210). In this author's opinion, Bates and MacWhinney's criticism that

second language researchers have, in the main, given little attention to the complexity of possible L_1/L_2 interactions, is justified. Unfortunately, many of these studies which have downplayed the importance of interference effects in L_2 acquisition/learning have been based on structurally similar languages. Therefore, decisions concerning the primacy of 'developmental' or 'interference' factors, particularly with regard to child L_2 acquisition, will have to await further evidence from studies comparing structurally dissimilar languages. As Zobl (1980b) and Wode (1981) have suggested, the present controversy over the selective effects of negative transfer to and from L_1 and L_2 derives from the congruity, or near-congruity of the native and target features being studied: "Only studies of structurally dissimilar languages can disambiguate these interpretations" (Ervin-Tripp, 1974, p.126).

3. Mode of Testing

If, as Tremaine (1974) and Kessler(1971) suggest, linguistic developmental sequences are closely linked to cognitive developmental sequences, the effect of "task-" i.e., the intensity of linguistic and metalinguistic demands made on the learner whose proficiency in L_2 is being assessed- must be considered in accounting for variations in L_2 performance across both individuals and groups. Since the confounding effects of

'method of testing' have already been considered with respect to the linguistic manifestations of the Age-Effect (see pp.23 to 24 of this discussion), this section of the Literature Review will be concerned with specific attempts by researchers to compare linguistic vs. metalinguistic performance in L_2; particularly in the assessment instruments used to conduct such research.

Heilenman (1981) compared the performance of thirty-one college level students learning French to Tremaine's (1975) study of sixty grade-school children learning French in immersion FLES programs. Although results on Heilenman's version of the straight comprehension task (matching orally presented sentences to pictures) were "equivocal" with respect to differentiating these two groups of L_2 learners, performance on the three metalinguistic subtests, which involved matching synonymous sentences within and across both languages, produced ". . . striking differences between student. . . and child performance" (p.61). Although the children had the same proportion of errors over all three metalinguistic subtests, the college-level French students "virtually reversed themselves, producing 70% of their errors on inflectional items and only 30% on syntactic items" (p.61). Heilenman concludes that the college student' advanced cognitive capacities gave them an advantage over the children in the syntactic-synonymity judgment task (p.64).

Additional evidence tying linguistic complexity to metalinguistic performance comes from Kessler's (1971) study of twelve Italian-American bilinguals, aged 6,1 to 8,3. Although Kessler found that the "appreciation of synonymity. . . was not well-developed" in any of the children tested (p.83), the easiest aspect of the cross-language synonymity task was the matching of Italian and English sentences with similar structures- (e.g., pairing inflectional markers, "which provide overt clues for underlying relationships" (p.95)), while the most difficult aspect of this task was relating structural aspects of Italian and English which contained "language-specific features" (p.95)- such as the "re-ordering of the elements in embedded sentences" (p.94).

Green (1974) included a synonymity judgment task (auditory comprehension and oral production) in his assessment of the English language proficiency of fifteen college-level ESL students: five beginning, five intermediate and five advanced-level students (p.58). Five grammatical structures were assessed and performance was compared to results obtained earlier (Green, 1969) from twenty-five monolingual children, aged 5-9 years old. Apart from the fact that the production-synonymity task was significantly more difficult for the adult ESL learners than all other subtests, particularly for the students at the lowest level of proficiency in ESL, the adult subjects evidenced "no great discrepancy in the

mode of task" (p.65). This finding was not supported in Green's study of the monolingual children, whose performance on the synonymity judgment task was significantly poorer than their performance on the straight comprehension task; especially for the youngest children tested (1969, pp.192-195). Green concludes that ". . . the ability to match equivalent structures is progressively developed, stretching over a period of four to five years" (1969, p.192).

Another aspect of metalinguistic capacity among adult ESL learners- specifically, error detection or grammaticality judgment- was investigated by Schachter, Tyson and Diffley, in 1976. Through prior contrastive analyses, these authors isolated language- specific errors in the production of English relative clauses among speakers of Arabic, Chinese, Japanese and Persian. These "malformed" relatives were combined with "native" English relative clauses, and administered as a reading test to "100 high-intermediate and advanced (university-level) students of ESL;" (p.71)- twenty students from each of the four language backgrounds described above, plus Spanish. Subjects were then asked to identify the sentences as "grammatical or ungrammatical" (p.72). Although all five language groups were able to "both generate and recognize native relative clauses," (p.75), all but the Japanese students identified their own "malformed relatives" as grammatical (i.e., they were not able to detect errors that

were specific to their own language backgrounds), while their responses to other (non-L_1) malformed relatives were "random" and varied significantly across language groups (pp.73-74).

In another study of grammaticality judgment among adult second language learners, (Bialystok, 1979) compared three groups of FSL students: 97 tenth graders in their fourth year of French study, 143 twelfth graders in their sixth year of FSL, and forty-five adult civil-servants in an intensive French-language program (p.85), in their ability to detect and define errors in orally-presented sentences involving French adjectives, direct/ indirect pronouns, and verb formations.

As with Schachter et al's results, the identification of correct sentences was significantly "easier for (all) subjects" tested (p.90). However, in Part II of this study, where subjects had to isolate the error by determining its form class, and in Part III, where subjects had to identify the exact "rule" that was violated by the error, several important differences among the subject groups emerged: 1) in Part III- error/rule association-rules which referred to specific lexical items were easier than the rules which were more abstract (e.g., the masculine vs. feminine "bon/bonne" distinction compared to agreement or tense formations) (p.90); 2) there was a strong part-of-speech by task interdeperdence. For example, "The verb errors show(ed) the most sensitivity to the increasing demand of the

detail conditions" (p.95), and 3) grade twelve students were consistently poorer than both tenth grade students and civil servants in all error conditions (p.91).

To Bialystok, the twelfth-grade "ceiling-effect" was an unexpected finding. As she states-

> It is not clear why the Grade 12 subjects, who had been judged in the design to be at the intermediate level of study in the sample, experienced the most difficulty with the task. . . . This descrease in performance for the Grade 12 students needs to be examined in terms of their program of study, their own experience with the language, and their attitudes towards the language and the testing situation to identify the reasons (underlying their poor performance). (p.99)

In sum- it seems likely that 'mode-of-testing' may be as selective in its effect on the second language learner's performance as 'interference,' interacting differentially with separate aspects of syntax and semantics, with the learner's level of proficiency in L_2, with the age and first language background of the language learner, and (potentially) with other factors of L_2 performance often associated with individual differences in learning styles and capacities.

4. Individual Differences

Aptitude, Achievement, and Learning Environment

Snow and Hoefnagel-Höhle (1979b) have speculated that ". . . research aimed at discovering components of language learning ability (which) has been based on formally taught second

languages. . . (may possibly show results that) reflect components of educability as much as components of language ability" (p.151).

Two distinct viewpoints have emerged with regard to second language learning aptitude and achievement. Cummins (1980) has proposed that "There exists a reliable dimension of proficiency . . . (termed, cognitive/ academic language proficiency, or CALP) which is strongly related to cognitive skills and which can be empirically distinguished from interpersonal communicative skills. . ." (p.177), while Carroll, co-author of the Modern Language Aptitude Test (Carroll and Sapon, 1959), has argued for a concept of foreign language aptitude in which ". . . verbal intelligence is not a necessary component" (1981, p.106).

Evidence in support of the first view- that it is not possible to separate second language learning capacities from factors of general intelligence- comes from the following five sources, among others:

Kessler (1971) found that the bilingual six to eight year old children whose Stanford Early School Achievement Test scores were highest had made the greatest advances in the understanding of linguistic variation or structural relatedness" (p.83). Kessler also found that the "SESAT correlate(d) with both Italian and English cumulative scores (on her test battery) with a 0.91 coefficient" (p.46).

Genesee (1976) reported statistically significant differences

among English-speaking grade school children acquiring French in school- either in immersion or FSL programs- when the students were classified as above average, average, or below average on a standardized I.Q. test. A battery of French language-skills test was administered, and at all three grade levels (fourth, seventh and eleventh) on all three tests of academic language skills, test scores varied significantly with I.Q. level (p.278).

Wesche, Edwards, and Wells (1982) administered the adult version of the Primary Mental Abilities Test, or PMA, and the Modern Language Aptitude Test (MLAT) to 793 adults in an intensive training program for Canadian public servants (aged 18-57). Wesche et al found that among the MLAT subtests, "Words in Sentences" (which is a test of grammatical sensitivity) showed significant correlations with all the PMA subtests with the exception of "Spatial Relations" (pp.132-133). And, among the PMA subtests, "Reasoning" was the most strongly correlated to the MLAT battery. . ." (correlating) with the MLAT total score at .65, . ." (p.133).

Cummins (1979; 1980) reviewed nine studies in support of his hypothesis ". . . that the cognitive/ academic aspects of L_1 and L_2 are interdependent and that the development of proficiency in L_2 is partially a function of the level of L_1 proficiency at the time when intensive exposure to L_2 is begun" (1980, p.179). In these studies Cummins found similar patterns of correlation between first and second languages with respect to language

aptitude and I.Q. variables (Ibid.)

Genesee and Hamayan (1980) found a significant correlation ($r = .60$; $p < .001$) between children's reading scores on the Metropolitan Achievement Test in English and the Test de Rendement en Francais, a test of French language-skills, for fifty-two English speaking first graders acquiring French in an immersion program in Montreal, Canada (p.105).

All of these authors, however, acknowledge that some language abilities, particularly those related to oral language production and interpersonal communicative skills, may lie outside of the CALP sphere of influence (Cummins, 1980, p.178). Wesche et al (1982), for example, describe a factor "measured by the remaining MLAT subtests. . . represent(ing) memory processes . . . which operate primarily at the lexical and phonological levels, presumably having little to do with the abstract reasoning ability and first language sophistication represented by other factors" (p.137). Similarly, Genesee's 1976 study found an inconsistent relationship between I.Q. levels and performance on measures of interpersonal communication skills, and Genesee and Hamayan (1980) found little correspondence between oral production skills in French and first graders' reading skills in their native (first) language, English.

This consistent emergence of a factor or factors which remain largely independent of general intelligence measures confirms Carroll's view of a distinct, multi-componential foreign

language-learning aptitude. However, Carroll himself does concede that ". . . verbal intelligence may be more extensively required in more formal foreign language-learning settings (1981, p.106). Carroll goes on to "speculate(d) that the extent to which general verbal intelligence is required in foreign language courses depends upon the degree to which the mode of instruction puts a premium on a student's verbal intelligence in order to understand the content of instruction" (Ibid.).

The claim that the learning environment influences which aspects of general intelligence, academic achievement, and/or language aptitude will be summoned-up in the course of acquiring L_2 has been upheld by other researchers as well; some of whom have already been reviewed vis-a-vis the 'content of instruction' issue raised earlier in this discussion (see pp.9 to 10). Bialystok (1978b), for one, found that language learning aptitude and the conscious use of certain language-learning strategies on the part of the L_2 learner (e.g., functional practice) were consistent prognosticators of success in a second language- "across all criterion measures" (p.228), for 157 tenth and twelfth grade Canadian high school students acquiring French in a forty minute-a-day program. Bialystok suggests two possible explanations for her findings: one- "high aptitude language learners. . . would consistently have an advantage over low-aptitude learners regardless of the learning circumstances" (p.228), or, two- all learning in a foreign language classroom,

even learning which purports to be "functionally based," is a priori "formal language learning;" thus, "language learning aptitude (would predictably) have a primary and possible exclusive role in achievement" (p.229) in what Bialystok calls, "the insular environment" of the classroom (p.231).

One large-scale attempt to match "individual learning style(s)- sensory, cognitive and affective- to success in different aspects of French (second language) training" (Wesche, 1981, p.126) has been taking place in Canada since 1969. Subtests of the MLAT (1958) and the Pimsleur Language Aptitude Battery (LAB) (1966) have been used to prescreen adult candidates for an intensive L_2 learning program, by predicting their potential for successful completion of the program and their rate of progress through the program (p.121), in Canada's nation-wide effort to train thousands of its public servants to meet the second-language requirements of the 1969 Official Languages Act. The MLAT and LAB subtests, along with counselor evaluations of potential candidates, are used to pre-select and streamline students by level of ability, as well as to match students to one of three "alternative instructional approaches-" Audio-Visual (Core) Method; Analytical (traditional) Method; or, Functional (situational) Method (pp.127-128). Preliminary reports of the success of this "matching" procedure (Wesche, 1981) indicate that "The appropriately matched students (at least, in the "Analytical Method") reported greater interest in foreign languages, more

initiative to continue practicing French out of class, a more positive attitude toward the teaching method used, and less anxiety in class. They also achieved superior scores on three of the four achievement measures. . ." used to assess French-language proficiency (Ibid., p.137).

Although these Canadian public servants evidenced favorable attitudes toward learning a second language which, in turn, coincided with higher levels of achievement in L_2, the relationship between learner-aptitude and achievement and learner-attitude is not always so concordant, as we shall see in the next part of this review.

Attitude, Bilingualism and Sex Differences

Among the most perplexing questions in second language learning research is the extent to which affective factors (". . .factors that encourage intake (italics)" ((Krashen, 1981, p.159))) influence L_2 learning processes. We have seen, for example, the so-called "teenage-ceiling effect" confounding studies of child vs. adult second language acquisition in Snow and Hoefnagel-Höhle, 1978; Ramirez and Politzer, 1978, and Bialystok, 1979.

Recently, Snow (1980) has speculated that the fall-off in performance among her (non-university) older subjects may have been due to the fact that they were "working class" adults who were "not in communicative/ pragmatic (social) contexts that

encourage(d) Dutch usage" (discussion notes). Oller, Hudson, and Liu (cited in Oller, 1977, p. 179) report a similar positive relationship between attitude variables and attained proficiency when the learners (in this case, groups of Chinese nationals studying for advanced degrees in the United States and Mexican-American women studying in a job-corps program) were in a social context where the "density of opportunities to communicate with speakers of the target language (was) greater" (Ibid.).

In a classroom setting, Naiman, Frohlich and Stern (1975) found that the best predictor of success in learning French as a second language was the student's "general attitude towards learning the language. . ." (p.258). Tucker, Hamayan and Genesee (1976) also found that the best predictor of French (second) language achievement among Canadian seventh graders they tested was a favorable attitude toward learning French; indeed, aptitude was found to be less significant a predictor of French achievement than attitude among these students (cited in Krashen, 1981, p.170).

On the other hand, Gardner and Lambert (1972) found "two relatively independent factors. . .related to the successful acquisition of a second language" (p.214). Language "aptitude," these authors suggest, is related to achievement in learning contexts where formal language skills are taught, whereas language "attitude" is more closely related to the successful development of communicative skills (Ibid.).

Burstall (1979), reporting on a ten-year project to teach French in the primary schools of Wales and England, found that although the experimental group of children (who began 'early' French-language instruction at age eight) did have a more positive attitude toward learning French than those pupils who began their FSL instruction at age eleven, ". . . the more positive attitude was not reflected in a correspondingly higher level of achievement" (p.139). Burstall did find, however, that socioeconomic factors played a role in the students' achievement: i.e., high mean scores on measures of French language proficiency tended to correlate with "high-status" parental occupations and low mean socres with "low-status" parental occupations (Ibid., p.140).

Bialystok (1978b) also found no significant correlation between measures of learner-attitude and four French-language achievement tests, across the 157 tenth and twelfth grade students she tested (p.227), confirming Gardner and Lambert's (1972) "claim that intellectual and motivational learner factors (cognitive and affective) are independent" (Bialystok, 1978b, p.226).

Most recently, negative relationships between attitude and achievement have begun to emerge in data from second language learning research. Genesee and Hamayan (1980), for example, reported that even "young second language learners (first-graders acquiring French in an immersion program in school) may

achieve relatively high levels of proficiency in skills which do not require active, overt participation on their part (in this case, listening comprehension skills) despite relatively negative attitudes toward the target language group and their teacher" (p.107).

Another area of great controversy among second language learning specialists- the state of being bi- or multi- lingual- has been reviewed by Lambert (1981). He suggests that the bilingual youngster has ". . . tremendous advantages, not only in terms of language competencies but also in terms of cognitive and social development" (p.10). Lambert cites several studies which show a greater "cognitive flexibility" and "linguistic sophistication" among bilingual children, particularly with regard to metalinguistic capacities (p.11).

In addition to the purported cognitive and linguistic advantages of being bilingual, "It has been found that those with early (bilingual) immersion experience are more anxious to learn a third language than are the controls. . ." (Ibid., p.17). For example, Genesee, Lambert and Tucker (1978), reporting on a trilingual education project in two Hebrew day schools in Montreal, Canada found that the pilot "immersion" group (from kindergarten to fourth grade - L_2/L_3 were French and Hebrew as the languages of instruction) had significantly better performance on the French language proficiency tests than the two non-immersion control groups (p.345), while the Hebrew language

proficiency of the French immersion students was equal to or slightly better than that of the students in the two comparison groups (Ibid., p.346). Bialystok (1979) found a parallel significant advantage in L_3/ French language performance for those adults she tested (high-school students and civil servants) who had exposure to other languages (but, for the 'error-rule association' condition only) (p.91).

Although sex differences have been largely ignored in the second language acquisition/ learning literature, a re-examination of some of the studies previously cited in this review reveals some important facts with regard to male/ female differences in L_2 performance.

Weber-Olsen and Ruder (1980), for example, found that "pair-wise comparisons indicated that female children performed significantly better than male children on the post-test ($p < 0.05$)" (p.192) on all four Japanese locatives. Burstall (1979) found that "Throughout the (ten-year) period of the (FSL) experiment the girls in the experimental sample scored significantly higher than the boys on all tests measuring achievement in French" (p.139) and they "consistently" maintained a better attitude toward learning French than the boys in the study (p.104).

Gardner (1972) found tenth grade girls superior to tenth grade boys on the following measures of second language proficiency and motivation: 1) the "Paired Associates" subtest

of the MLAT, 2) French language grammar tests, 3) motivational intensity, and 4) French-English translation, particularly in their knowledge of lexical equivalents in the two languages (p.212).

Admittedly, the experimenter who attempts to discover those differences within and across individual language learners which influence L_2 performance must wade through some of the muddiest waters surrounding second language acquisition research (which undoubtedly accounts for the dearth of such studies in the experimental L_2 literature).

Nevertheless, it seems apparent from the few studies cited here, highlighting such factors as- aptitude, achievement, learning environment; attitude, bilingualism and sex differences, that individual differences do have a significant impact upon L_2 proficiency, and that the specification of which individual characteristics "matter most" in L_2 performance should be one of the principal concerns of second language research; particularly with regard to the choice of instructional methodologies appropriate to individual learning styles, limitations and capacities.

5. Conclusions

We now return to the question posed at the beginning of this chapter- "Can the Age-Effect be addressed independently?" of the

separate and aggregate influences of such factors as- the linguistic subtest being examined, negative and positive transfer to and from target and native languages, the methods used to assess L_2 proficiency, and individual differences within and across second language learners that affect L_2 performance. Some fifty-five studies later, the answer to this question must be an unequivocal, "No."

Once we have answered this transparently rhetorical question, however, we can dismiss it as non-interesting, for it does not address the real lesson to be learned from the prior Literature Review. That is: there is much more detailed study to be done before second language researchers can even entertain the question of an "Age-Effect," per se. For example, research such as Bialystok's 1979 cross-sectional study and Burstall's 1979 longitudinal study (op. cit.) attempted to examine L_2 proficiency within a limited subset of linguistic concepts, relative to a defined subset of L_2 learner characteristics, under experimentally controlled test conditions. These two studies point the way to future research in the field of second language acquisition/ learning. However, no experiment that this author is aware of has attempted to look at the multiplicity of factors reviewed here-adequately and conjointly. The challenge to the L_2 researchers, therefore, is to examine second language learning over a range of ages, within and across micro-linguistic domains, using a variety of test methods over a range of difficulty.

The research must also take into account the possible influences of first language interference factors and individual differences within and between second language learners. To quote Barry McLaughlin (1980b): ". . . whatever conceptualization is employed to account for differences in learning processes, the requirement of falsifiability must be met. Appeals to (terms such as the "Age-Effect") have no meaning unless these terms are tied to observable experimental conditions. Lacking this, we are in a night where all cows are black" (p.335).

Chapter III, Methodological Considerations, will detail the conditions under which the multiplicity of L_2 learning factors described above may be subjected to experimental control.

CHAPTER III

METHODOLOGICAL CONSIDERATIONS

From its inception, the primary goal of this project has been to design a controlled second language learning experiment that would enable the researcher to look at the multiplicity of factors enumerated in Chapters I and II of this dissertation: Age, Sex, Response Type, Interference, Reading Level/ Academic Standing, Linguistic Set, Attitude, Bi/ Multilingualism, and Socioeconomic Factors- 'adequately and conjointly.'

Since some of the methodological problems that have confounded previous attempts to examine the Age-Effect and other aspects of second language performance have already been discussed in the Literature Review, it might be useful to detail how decisions were made in formulating the present experiment, specifically with regard to the selection of subjects, stimuli and test materials, in the hopes of avoiding some of those prior methodological 'pitfalls.'

Subjects

Many of the studies cited in Chapter II of this dissertation have been criticized for forming generalizations about second language performance based on a limited population of language learners (Ervin-Tripp, 1974; Rosansky, 1976; Snow, 1980; Zobl, 1980a and b). In statistical terms, the pre-selection of a

subject base along such narrow lines produces the phenomenon of the truncated range (:) "The problem of truncated range is not uncommon in behavioral research, since much of the research is conducted in the colleges and universities where subjects have been preselected for intelligence and related variables. Consequently, when an attempt is made to demonstrate the relationship between variables. . . , the resulting coefficient may be lowered because of the truncated range" (Runyon and Haber, 1976, pp.133-134).

In order to have as broad a subject base as possible for the present experiment, public rather than private school children, representing a wide range of ages from pre- to post-pubescence, and drawn from a variety of ethnic and socio-economic backgrounds, were sought out.

The two cooperating public school systems selected for this project were White Plains and New Rochelle- two small suburban cities located in lower/mid Westchester County in New York State. Because of their proximity to New York City and their own patterns of economic development and in-migration, they represent economically, racially, and ethnically diverse communities. Both school systems, for example, support busing for purposes of racial and ethnic balance, and 1982 school census reports indicate the following distribution of pupils along racial and ethnic lines (based upon a school population of approximately 6,000 students in each school district): in White Plains, 33% Black, 2% Asian,

10% Hispanic (mainly Peruvian and Colombian), and 55% White and "Other" (Jones, Note 1). In addition, between 20% and 25% of White Plains' pupils are estimated to come from bilingual or non-English (first language) backgrounds (Gilligan, Note 2). In New Rochelle, the breakdown is 30% Black, 2% Asian, 6% Hispanic, and 62% White and "Other", while approximately 20% of the students come from non-English or bilingual language backgrounds (Gray, Note 3).

Within both school systems, students are homogeneously grouped from the first grade on in core academic subjects (e.g., reading/ English, mathematics, social studies) based on a) results of the Iowa Tests of Basic Skills, b) other local tests, and c) teacher evaluations of classroom performance. Since Chapter II of this dissertation has presented contradictory evidence relating second language proficiency to first language proficiency, the selection of subjects for the present study had to make provision for a close examination of the relationship between aptitude and achievement in L_1 (English) and aspects of second language learning performance. This was accomplished in the following way: wherever possible, within each of the grades accessed, three types of classes were selected for experimental treatment- the first, reading "at grade level," the second, reading "slightly above grade level," and the third, reading at "honors" or "well-above grade level" in English. No attempt was made to include classes reading below grade level

since the experimenter wished to avoid possible confounding effects of reading or language impairments of any degree on this study.

The final access set, defined by attendance at the end of the experiment, consisted of 208 students distributed among nine classes. (Ct. Table 1.)

Beyond the access set, grasping a rare opportunity when it arose, 12 ninth graders from Albert Leonard J.H.S. in New Rochelle were also tested because of the unique fact that they were in their second year of instruction in Latin. It was hoped that these subjects might shed some light on the consequences of formal instruction in a "dead" language for the second language learning issues of interest to the present study.

Stimuli

1. The Selection of the Target Language

Several possible target languages were put forth in the early stages of this project and, by process of elimination, dismissed 'for good cause.' Since the selection procedure itself illuminates many of the key concerns of this dissertation, it will be summarized below.

The first possible target language to be considered was the Modern Language Aptitude Test (MLAT) (Carroll and Sapon, 1959). Although the MLAT is a recognized standardized test of language learning aptitude that has been useful in predicting those

Table 1

Distribution of Subjects in the Access Set by

Grade, Class, Reading Level, School and City

Grade	Class	Reading Level	School	City[1]	n
4	4P	at grade	Mamaroneck Avenue	W.P.	19
	4H	above grade	Mamaroneck Avenue	W.P.	26
	4U+	well-above grade	Mamaroneck Avenue	W.P.	27
7	7H	above grade	Albert Leonard J. H. S.	N.R.	24
8	8R	at grade	Albert Leonard J. H. S.	N.R.	26
	8P+	honors	Albert Leonard J. H. S.	N.R.	33
11	11M	at grade	White Plains H. S.	W.P.	18
	11S	above grade	White Plains H. S.	W.P.	15
	11S+	well-above grade	White Plains H. S.	W.P.	20
					Total=208

[1] W.P. = White Plains
N.R. = New Rochelle

individuals who will succeed in foreign language instruction in a variety of formal settings (Carroll, 1981), it had several disadvantages in terms of this experiment.

1- Since the majority of the test items are based on English or nonsense-word paradigms, it was not possible to use the MLAT to test interference factors to and from native and target languages.

2- Specific linguistic features within linguistic subtests (e.g., word order variations between native and target languages) could not be considered using the MLAT. The MLAT does have one subtest called "Words in Sentences" which is a test of grammaticality, but it is solely a part-of-speech/ lexical association task, which does not assess the fine distinctions between functional and structural categories in syntax and semantics which the Literature Review found were necessary to discriminate.

3- The MLAT has been standardized on school children from Grade 9 and above (Carroll and Sapon, 1959, p.3). Since the present experiment calls for the treatment of pre-pubertal children (Grade 4 subjects), the MLAT would not be an appropriate instrument for use in this study.

Similarly, the use of a Miniature Artificial Language (MAL) (e.g., Braine, 1971; McLaughlin, 1980a) was ruled out as a possible target language since a) interference issues could obviously not be addressed using a MAL, and b) although micro-aspects of linguistic subsets can be strictly controlled using

MALs, they are essentially languages with no history; therefore, a body of contrastive and/or developmental data would not be available for the researcher in interpreting the results of MAL experiments.

With the decision to use a "living" language as its target language, possible natural languages were put forth for consideration. Since, as already indicated, an estimated 20% to 25% of the children in both White Plains and New Rochelle Schools come from first language backgrounds other than English, the first criterion for selection of a natural language was that it be assuredly unknown to the subjects. Languages as diverse as: Russian, Ibo, Basque, Rumanian, and even some of the AmerIndian languages had to be eliminated from consideration since there were representative groups of these first language users in either or both school systems. Secondly, languages closely related to English (e.g., German and Dutch) were dismissed as possible target languages following the criticisms voiced by Ervin-Tripp (1974) and Zobl (1980) with regard to language learning studies comparing structurally similar first and second languages (pp.33-35).

Third, the target language had to have orthographic symbols that were readily transferable to the Latin alphabet so that the subjects could read as well as hear the stimulus materials. Thus, certain Eastern-European, Middle-Eastern and Asian languages were eliminated from consideration as possible target

languages.

Fourth, it was important that the target language have a body of extant linguistic literature to permit certain desired contrastive concepts to be analyzed. If possible, it was hoped that the target language would have some developmental data available to know if a native user of this target language would have mastered the particular linguistic features to be investigated by age nine (the lowest age of subjects used in the present study, for whom English was the native language). In this way, the categorization of 'developmental' vs. 'interference' errors in the subjects' test responses could be accomplished more realistically.

Fifth, in order to study the linguistic issue relative to the interference issue in detail, a "mix" of transferable and non-transferable features had to be present in the target language such that: X feature was present in the target language, but not in English; Y feature was present in English, but not in the target language; English and the target language shared some features in common, across both syntactic and semantic domains of interest to this study.

Sixth, it was important that the target language and the culture which the language represented be inherently interesting and motivating to both the children and young adult subjects treated. This was of import since the exposure to the target language would be limited in time and constrained by a

controlled experimental format.

Having met all six criteria and eliminated all other contenders, Hawaiian- a Polynesian language of the East-Polynesian group- was selected as the target language for this experiment.

2. The Target Language- Hawaiian

It is not the intention of this researcher to describe the Hawaiian language in depth, except for highlighting those specific features of Hawaiian which are relevant to the present study.

Hawaiian, like Samoan, Tahitian and Tongan, is a member of the Malayo-Polnesian language family. Due to Hawaii's history of colonization, English-speaking "foreigners" (mostly missionaries) translated many early Hawaiian folk tales and legends into English, and conversely, the Bible into Hawaiian. Therefore, Hawaiian has been transcribed into English orthography for approximately 150 years, with some special adaptations for Hawaiian phonology (e.g., /ʻ/ to represent the phonemic glottal stop) (Stewart, Note 4).

Today, there are approximately 300 first language users of "pure" (non-Pidgin) Hawaiian, mostly on the island of Niʻihau in Hawaii (Elbert and Pukui, 1979, p.8). Recently, a Committee for the Preservation of Hawaiian Language, Art and Culture has been formed to, among other things, re-stimulate the use of the native Hawaiian language. There is an Hawaiian studies program at the

University of Hawaii at Manoa, and there is now a modest attempt to reinstate Hawaiian as a second language in the schools of the Kamahameha School District on the island of Oahu (Ibid., pp.8-9; Hawkins, Note 5). Hawaiian is by no means a dead or dying language.

Structurally, Hawaiian is, like English, a "head first" language ". . . in which the head of a construction comes first in its phrase" (Ritchie, 1982, p.2); the common order being Verb-Subject-Object, rather than Subject-Verb-Object (as in English). Unlike English, however, Hawaiian has no inflections and no "qualifiers" (adjectives or adverbs). Content words, only verbs and nouns, are marked by pre-posed or post-posed "particles" which have semantic and syntactic functions in Hawaiian. Some of the more common particles are: "ua," indicating perfect aspect, "ka/ke," definite articles which serve as noun markers, "ma," a preposition indicating directionality or location, and "i," which has a dual function as a locative preposition or as a direct object marker after transitive verbs.

Also unlike English, common simple sentences in Hawaiian usually consist of VP $\pm$ NP; e.g.,

> "Komo ka lole."
> (Put on (is) the dress, or,
> The dress is put on.)

which is "neither intransitive nor transitive. . . but (timeless, or) stative" in voice (Elbert and Pukui, 1979, p.40).

Stewart states that "verbs are intrinsically stative in Hawaiian," and that "you have to yank them out of stativity by a marker that says, in effect, cancel stative" (Stewart, Note 6). These stative verbs may be "yanked out" of their stativity, or converted to "deliberate transitives" (Elbert and Pukui, 1979, p.52) by the insertion of the post-posed direct object marker, "i." Compare, for example-

"Mama / / ka 'awa."	to	"Mama / / i ka 'awa."
(Chewed (is) the kava, or, (The kava is chewed.)	vs.	(Chew the kava.)

(Elbert and Pukui, 1979, pp.52-53).

The latter conversion to transitivity produces a Hawaiian sentence which is directly translatable into the imperative form of English sentences such as, "Put on the sandals," which can be translated to "Komo i ka pa'a hakahaka" in Hawaiian. This contrast between stative and transitive sentences in Hawaiian and English will form the basis for the syntactic stimuli used in this experiment.

In addition to the use of "i" as a particle whose sole function is to mark the transitivity of Hawaiian verbs, "i" is also used as a locative preposition; a pre-posed noun marker with a meaning akin to "at" or "to" in English. It contrasts semantically with another locative preposition, "ma," in the following way: Hawkins (cited in Elbert and Pukui, 1979) suggests that "when *i* (italics) and *ma* (italics) are spoken together, the larger area is marked by *ma* (italics) and the smaller, or more

specific one, by i (italics)" (pp.134-135). For example, "Go to the beach," would be "Hele aku ma ka hakai," but, "Go to the beach at Waikiki," would be "Hele aku ma ka hakai i Waikiki." The semantic contrast between the locative prepositions "i" and "ma" provides this experimenter with a second opportunity to compare linguistic entities both present and absent in English; i.e., English uses the locative prepositions "at" and "to," but they do not encompass the same semantic space as "i" and "ma" in Hawaiian. This contrast will therefore form the basis for the semantic stimuli and test materials used in the present experiment.

As a post-script, Elbert and Pukui (1979) note that "In Proto-Polynesian the object marker is *i (italics), and the locative marker is *ki (italics)" and that "These two forms have coalesced in Hawaiian" (p.135). In this respect, it will be interesting to discover if particular groups of (predominantly) mono-lingual, English speaking children and young adults find it 'easier' or 'more difficult' to learn "i" as a purely grammatical function word or as a semantically salient locative preposition.

3. The Instructional Materials

Like the selection procedure used to discover an appropriate target language for this study, the instructional materials had to meet specific pre-formulation criteria in order to create a first lesson in Hawaiian that would fulfill the experimental requirements of this project.

1- Since language is learned 'by ear and eye,' the lesson had to be pictorially, orthographically and auditorily presented.

2- Since memory for vocabulary words (apart from the specific syntactic and semantic lexical concepts to be investigated) was not an issue which this experimenter wished to address; particularly since the Literature Review has shown that memory capacities in older subjects have confounded the assessment of semantic and syntactic aspects of a second language (e.g., Ramirez and Politzer, 1978), the lesson had to provide the subjects with an accompanying, separate vocabulary "list" to which they could refer throughout the lesson and test sessions; without fear of having to memorize lists of words.

3- Since the lesson was to be group-administered in a regular school setting, it had to fit in to a fifty-minute class period, including the test in Session 1- leaving approximately twenty minutes for the Hawaiian lesson itself.

4- Since the lesson had to be motivating for both children and young adults treated, it had to be placed in an interesting format using characters and a story that would be stimulating and entertaining to the subjects.

5- Since both syntactic and semantic aspects of the Hawaiian lexicon were to be taught, stimulus materials had to be equally divided between syntactic and semantic concepts in order to insure that differences in the subjects' performance would not be due to differential exposure to the two domains.

6- Since the previous two chapters have presented several sources which suggest that specific types of teaching methods and environments may favor specific groups of L_2 learners; in particular, children benefit more from informal, 'naturalistic' exposure to a new language while adults benefit more from 'formal' instruction in which linguistic rules are overtly and explicitly presented to them (Bialystok, 1978a and b; Krashen and Seliger, 1975; Krashen, 1976; Macnamara, 1973), the training materials and procedures had to provide for a direct comparison of the two above-stated methods of instruction.

The instructional materials created to fulfill these six criteria evolved into a cartoon story of an Hawaiian family, in a "comic book" format, which included a detachable "vocabulary page," and was accompanied by an audio-cassette tape recording of the story with an introductory vocabulary presentation. The comic book is 48 frames in length, equally divided between the syntactic and semantic lexical concepts of interest to this experiment (Part I- the stative/transitive verb contrast; Part II- the locative "i" vs. "ma" contrast), and each part is preceded by a single-page explanation ("rule statement") of the syntactic or semantic contrast that is to be learned. A copy of the lesson appears in Appendix 1.

The audio-cassette tape recording was 18-20 minutes in length and consisted of some 2-3 minutes of Hawaiian music, followed by a 2-4 minute presentation of the vocabulary words to

be used in the story, and a 12 minute oral reading of the story itself. Directions to the subject were also included on the tape. The voices of the characters in the story were portrayed by different people who were trained by the experimenter in a "pseudo-Hawaiian;" i.e., the basic sounds of the vowel and consonants were preserved as well as the Hawaiian intonation patterns. However, some phonetic variants (e.g., the ka/ke distinction between the definite articles) were "regularized" in advance of the tape-recording to avoid confusing the subject-listeners. A copy of the audio-cassette tape recording is available from the experimenter upon request.

4. The Test Materials

Unlike the procedure previously described for the selection of the target language, which was fundamentally a subtractive process, the development of the test materials was essentially an additive process; building one test requirement upon another so as to insure that all issues of importance to this dissertation could be meaningfully addressed through an analysis of the subjects' test scores and responses.

Requirement 1- The balance between syntactic and semantic contrasts to be investigated was maintained by having an equal number of syntactic and semantic test items.

Requirement 2- The balance between "easy" vs. "hard" test items (e.g., tasks which included sentence items that were exact duplicates of sentences that appeared in the story vs. sentence

items that were rearranged versions of sentences that appeared in the story) was maintained so that every subject, no matter what his/her level of proficiency, could feel successful on some items at some level.

Requirement 3- The balance between test items that would incorporate "rule" learning and "rote" learning, in harmony with the sixth requirement of the stimulus materials to appeal to older vs. younger L_2 learners (p.67), was maintained by having subjects select or invent sentence- items that were either replicas of words and sentences in the lesson, or novel Hawaiian sentences created from new vocabulary words not appearing in the lesson.

Requirement 4- The balance between linguistic and metalinguistic tasks that would, as the Literature Review has suggested, favor certain groups of L_2 learners with specific cognitive capacities and L_1 proficiencies (Cummins, 1979; Genesee, 1976; Kessler, 1971; Wesche, Edwards and Wells, 1982), was maintained by providing test items that ranged from simple Multiple Choice selection of correct sentences to metalinguistic tasks such as Sentence Anagrams and Error Detection.

Requirement 5- The balance between items that would produce negative or positive interference from English to Hawaiian was maintained by having items that were facilitative of transfer because they "coalesced" with one another (Bates and MacWhinney, 1981) with respect to the syntax or semantics of both languages

(e.g., the command form of English sentences and transitive verb sentences in Hawaiian) and other items which were in "competition" (Ibid.) with one another with respect to the syntax or semantics of both languages (e.g., both English and Hawaiian use the locative prepositions "to" and "i," but "i" has a more circumscribed meaning in Hawaiian which is not present in English).

The entire test consisted of 28 items; 14 syntactic and 14 semantic. It was a "paper and pencil" test divided into three parts. The first 14 items (Part I), 7 syntactic; 7 semantic, were Multiple Choice questions which required the subjects to match correct Hawaiian and English sentences. The next 7 items (Part II) contained the specifically syntactic task, Sentence Anagrams, in which subjects were given strings of Hawaiian words and asked to arrange them into Hawaiian sentences in accordance with given English sentences. The last 7 items, (Part III)- Semantic Error Detection, required subjects to detect the wrong Hawaiian sentence from a group of four sentences, and, if they so desired, to rewrite the sentence correctly as provided in the test booklet.

Within each of the three Parts (Multiple Choice, Anagrams, and Error Detection) items were presented in hierarchical "sets," ranked according to their level of difficulty as determined by the experimenter:

Set 1- (easy)- (8 items)- "rote" memory (a word-for-word duplication of words and sentences appearing in

the story lesson);

Set 2- (less easy)- (8 items)- "rearranged" memory (a re-arranged version of words and sentences appearing in the story-lesson), and

Set 3- (difficult)- (12 items) "rule" knowledge (new vocabulary to be arranged in new sentences not appearing in the story-lesson).

In addition, for 21 of the 28 items, the foils, or incorrect choices, followed a predetermined 'pattern of primitiveness' designed by the experimenter to produce specific kinds of interference effects. In a four-choice-per-item paradigm, for example, choice a might be correct, choice b might be the wrong use of a Hawaiian rule, choice c might be the inappropriate imposition of a canonical word order on a Hawaiian sentence, and choice d might be a literal translation from English. By coding the subjects' responses item by item, and weighing them according to the rank order described above, a qualitative analysis of subject errors could disclose tendencies toward inteference or non-interference "strategies" among sub-groups of the second language learners tested. (For the seven syntactic Anagrams (Part II), the coding of errors had to await an examination of subjects' solutions. These errors will be detailed in the Results chapter.)

Each of the three "Parts" was preceded by written and oral directions and examples indicating how subjects were to complete

the test items. Subjects were given 25 minutes (for the J.H.S. and H.S. subjects) or 30 minutes (for the fourth grade subjects) to complete the test itself. Using a test/ post-test methodology, Test 1 was administered immediately following the Hawaiian lesson. A sample of the subjects' response sheet and the coding system used to analyze these responses will be found in Appendices 2 and 3, respectively.

5. Other Instruments

A 20-item English/Hawaiian Vocabulary Matching Test was administered to all subjects just before the post-test at Session 2, in order to determine the relationship, if any, between memory for the Hawaiian vocabulary words used in the story-lesson and test-score performance.

A 14-item Picture Verification Test (PVT) was included in the original experiment. It contained 7 syntactic and 7 semantic items, each item consisting of a four-picture frame one of which was a correct depiction of a given Hawaiian sentence. Subjects were asked to choose the one picture that "best matched" the sentence presented.

In addition to these tests, subjects were given a 25-item Questionnaire to complete at the end of Session 2 which contained items relevant to the demographic factors of interest to the present study. However, individual subject scores on the Reading Comprehension subtest of the Iowa Tests of Basic Skills (Item #6 on the Questionnaire) were obtained from the classroom

teachers themselves. Copies of the Vocabulary Test and the Questionnaire form can be found in Appendices 4 and 5, respectively.

Procedures

1. The Test/ Post-test Methodology

From the first, it was decided to assess the consequences of training immediately following the lesson as well as some time later using a test/ post-test methodology, because a) long-term vs. short-term memory assessment could reveal specific aspects of the instructional materials that were trained "best" by sub-groups of the L_2 learners tested over time, and b) the test/ post-test methodology enabled the experimenter to vary the type of exposure used. In particular, test Session 1 was preceded by the Hawaiian lesson itself, wherein subjects were exposed to a naturalistic, auditorily, pictorially and orthographically presented cartoon story in a communicative context, while Test Session 2 was not preceded by this Hawaiian lesson, except for subjects having copies of the original vocabulary page and the two "rule-statement" pages from the lesson available to help them complete the test items. In this manner, sub-groups of the subjects tested who learned "best" under either or both of these two instructional conditions (+/- informal exposure; +/- overt, explicit rules without informal exposure) could be identified.

2. The Pilot Experiment

The experimental methods and procedures described above were given a trial-run during the first two weeks of January, 1982. Twenty-two subjects were recruited from the experimenter's home community in White Plains, New York; 11 in the fifth and sixth grades and 11 in the ninth and tenth grades. Subjects were tested in groups of five or six at a time, and received monetary rewards for their participation in the pilot experiment. As a result of this pilot, several changes were made in the experimental treatments and procedures.

1- The Picture Vocabulary Test (PVT) was eliminated from the study since it generated almost no errors among the older subjects, while some of the younger subjects found the task confusing.

2- The time between test and post-test was shortened from a maximum of two weeks to a maximum of eight days. (An intervening snowstorm had, unfortunately, delayed some of the pilot subjects from completing the experiment within a week, and it was found that those subjects who were tested ten days to two weeks after Session 1 were not able to perform as well as subjects tested 6-8 days after Session 1.)

3- A repetition of the "vocabulary page" that was originally part of the audio-cassette tape recording was eliminated since a) the older subjects thought it was "boring" to hear the same words twice, and b) the repetition took up too

much time.

4- The pauses between the cartoon frames on the audio-cassette tape recording were shortened since subjects were observed to be 'reading ahead' due to the slowness of the tape. Similarly, much of the introductory Hawaiian music was eliminated for purposes of saving time.

One additional change in the stimulus materials occurred outside of the changes due to the pilot experiment. In the original version of the comic book, the heroine (Mele) attempts to "blow-up" her school and run away. Several of the school administrators of the potential fourth-grade subjects thought it was "inadvisable" to have their students exposed to materials that would suggest violent actions against school property, so the offending frames were altered to have Mele simply run away from school.

Some minimal changes were also made in the test materials as a result of the pilot in terms of the correction of spelling and punctuation errors and the re-spacing of test items to improve legibility. The finalized versions of the stimulus and test materials are, as previously indicated, in Appendices 1 and 2, respectively.

3. Administration of the Main Experiment

All 220 subjects in the main experiment were tested in their respective schools and classrooms between the weeks of May 5 and May 24, 1982, for both sessions 1 and 2. For all classes,

Session 2 took place one week after Session 1, in the same classrooms during the same time slots, with the exception of one class (4-U) which had an interval of eight days between Sessions 1 and 2 due to a conflict with the school music festival. Fourth graders were tested during their English classes, eleventh graders in the American History class, and the ninth graders in their Latin class. The Protocols for Sessions 1 and 2 are presented in Appendix 6.

The experimenter made a pre-treatment visit to each class involved in the main experiment one or two days prior to Session 1 to introduce herself to the students and to encourage participation of as many students as possible in the experiment. In most cases, the cooperating teachers were present during both Sessions 1 and 2; to assist the experimenter in handing out materials, to insure that subjects kept their identical Row and Seat assignments from Session 1 to 2, etc..

From the outset of this experiment, subjects' anonymity was guaranteed by having them identified solely by their class, Row and Seat numbers. This anonymity was maintained on the Reading Comprehension subtest of the Iowa Tests of Basic Skills by having the cooperating classroom teachers record the students' names and reading scores independently next to their row and seat numbers and crossing out the names before submitting the scores to the experimenter. In most cases, the Reading Comprehension subtest scores reflect the Spring, 1982 administration of the Iowa Tests

in both school systems, except for the ninth graders and the high school subjects whose scores reflect back to 1981 and 1978-1979 administrations of the Iowa tests, respectively.

Subjects were rewarded for participation in the main experiment with stickers and pictures from Hawaii at the end of Session 1, and with gift certificates for Baskin-Robbins ice-cream at the end of Session 2.

The administration of the main experiment was generally problem-free over both Sessions 1 and 2, with these exceptions -

1- One fourth grade class (4H) lost five minutes of their test time in Session 1 because of an unexpected delay in the experimenter's arrival in the classroom.

2- The fourth graders (especially class 4P) had a tendency toward spontaneous vocal imitation of the audio-cassette tape recording which may have distracted some of them from complete attention to and comprehension of the Hawaiian lession in Session 1.

3- There was a reluctance on the part of some of the subjects to answer several of the items on the Questionnaire. At least for some of the upper-grade students, this reluctance was expressed verbally as a distrust of the guarantee of anonymity put forth by the experimenter.

The following chapter presents the findings of the main experiment in detail.

CHAPTER IV

RESULTS

From the original "ACCESS' set of 208 subjects (Table 1), 20 subjects (5 from Grade four, 8 from Grade seven, 2 from Grade 8, and 5 from Grade eleven) were set aside from the remaining 188 subjects (the "ANALYSIS" set) since they had not been present at the first week's administration of the Hawaiian-language learning task; they had not been exposed to formal instruction in Hawaiian, and their performance could not be assessed on the basis of the test/post-test methodology required for this experiment.

Within this sub-sample of 20 "Second-session only" subjects, it was observed that 8 of the 20 were in the seventh grade class, leaving only 16 children remaining in the seventh grade analysis set. Since the 16 remaining subjects were too small a sample upon which to base any valid statistical inferences about seventh grade performance, and since, from an exploratory summary of the seventh and eighth grade reading levels, it appeared that the seventh and eighth grades would be no difference from the lowest and highest reading levels of the fourth and eleventh grades relative to the remainder of their groups, it was decided to form three main subject groups- one focused on the fourth graders (GROUP 4), one focused on the eleventh graders (GROUP II), and a middle group composed of seventh and eighth graders combined,

which, for purposes of convenience, will henceforth be termed, GROUP 8. These three groups now comprised an analysis set of sufficient size, upon which the experimenter could form valid generalizations.

Table 2 provides a summary of the three experimental groups thus formed. There are, as indicated, 57 fourth grade subjects, 73 eighth grade subjects (7/8 combined) and 48 eleventh grade subjects. Each of these three groups is composed of three READING CLASSES as stated, and the groups have divisions by sex roughly equivalent to each other. Reading Levels in excess of subjects' grade-levels are indicated as well, but scaled differently for the H.S. students than for the other two grades.

Table 2 presents the performances of the three groups in a style which will be standard throughout this chapter. The means are supplied followed by plus (+) and minus (-) signs and standard deviations defining the range around these means. For independent samples, it can be assumed that t-tests will be performed where results of the t-tests will be reported in terms of an alphabetic footnote system. The t's themselves do not have to be reported since they are implicit in the knowledge of the means and standard deviations that are supplied, following current standard usage.

From Table 2, it is observed that the three (school-) age groups are significantly different in performance on the first and second week; GROUP 8 performing best of all, GROUP 4 perform-

Table 2

Summary Descriptions Of Three Groups and Their Mean

Performances On The Hawaiian Learning Task

GROUP	FOURTH GRADE	EIGHTH GRADE	ELEVENTH GRADE
Number of Cases	67	73	48
Reading Class Distribution (Low/Medium/High)	16/25/26	16/24/33	18/10/20
Reading Level[1]	5.74 ± 1.50	11.09 ± 1.17	75.43 ± 14.35
Sex: Male/Female	31/36	40/33	24/24
Initial Score	5.45 ± 3.69[a]	14.52 ± 5.68[a]	10.54 ± 5.20[a]
Second-Week Score	8.10 ± 4.15[a]	17.27 ± 6.10[a]	14.02 ± 6.65[a]
Second-Week Gain	2.66 ± 4.44	2.75 ± 5.75	3.48 ± 5.77
Second-Week Vocabulary Test	6.09 ± 11.95	8.55 ± 4.31	10.31 ± 18.94

[1]Expressed as mean reading grade until high school, and thereafter as mean percent of class reading at grade level.

[a]$p < .001$, two-tailed for every group contrast.

ing worst of all, and GROUP 11 coming in intermediate between the other two values. Although the three groups are significantly different both at Session 1 and at Session 2, the "gain" between the first and second week's performance (i.e., subjects' improvement with practice) does not differ across the three groups; neither do the three groups perform differentially on the Vocabulary Review test that begins Session 2.

Table 3 breaks down the performance of the three groups by linguistic sectors, or subsets, of interest to the present study. It is observed that in all the groups, the 'easiest' task tended to be the Syntactic-Anagrams task while the most 'difficult' tended to be the Semantic-Error Detection task. Table 3 also indicates which subsets of the Hawaiian test distinguished the three groups of subjects from one another. It always is the case, for example, that the eighth graders exceeded the fourth graders. (The footnotes specify the extent to which the eleventh graders differed from either of the other two groups, where it is apparent that, with some regularity, the eleventh graders come in midway between GROUPS 4 and 8. It is also clear that on some variables this is not the case.)

Table 4 answers the question- "For each of the subject-groups, which of the eight means reported in Table 3 are significantly different from one another?" For this purpose, Pair-wise t-tests are presented whose values must be reported since a) they vary from the values presented in Table 3 with

Table 3

Performances Of The Three Groups Broken Down By

Linguistic Sector And Day Of Testing[1]

	FOURTH GRADE N=67	EIGHTH GRADE N=73	ELEVENTH GRADE N=48
INITIAL SCORES			
A: Items 1- 7: Syntactic Multiple Choice	1.76 ± 1.64[a]	3.95 ± 2.43	3.16 ± 2.06
B: Items 8-14: Semantic Multiple Choice	1.28 ± 1.27[a]	2.97 ± 2.07	2.71 ± 1.86
C: Items 15-21: Syntactic Anagrams	1.64 ± 1.59[a]	4.53 ± 1.48[a]	3.54 ± 2.04
D: Items 22-28: Semantic Error Detection	0.76 ± 1.31	3.07 ± 2.10[a]	1.13 ± 1.68
SECOND-WEEK SCORES			
A': Items 1- 7: Syntactic Multiple Choice	1.91 ± 1.69[a]	4.34 ± 2.32	3.69 ± 2.27
B': Items 8-14: Semantic Multiple Choice	2.04 ± 1.42[a]	3.53 ± 1.99	3.29 ± 2.17
C': Items 15-21: Syntactic Anagrams	2.21 ± 1.81[a]	5.11 ± 1.42	4.58 ± 2.01
D': Items 22-28: Semantic Error Detection	1.94 ± 1.47	4.29 ± 2.09[a]	2.46 ± 2.22

[1]All eighth grade measures exceed fourth grade measures at the .001 level. Annotations at fourth and eighth grade each refer to contrasts with eleventh grade measures.

[a]$p < .001$, two-tailed.

Table 4

Pairwise Contrasts For The Eight Measures Of Table 3[1]

		B	C	D	A[1]	B[1]	C[1]	D[1]	
FOURTH GRADERS N=67	A	1.78	0.46	4.46a	0.64	0.95	1.60	0.65	A
	B		1.78	2.76b	2.45c	3.95a	4.22a	3.30b	B
	C			4.26a	0.93	1.92	2.51c	1.46	C
	D				4.44a	5.40a	5.52a	4.96a	D
	A[1]					0.51	1.09	0.11	A[1]
	B[1]						0.68	0.52	B[1]
	C[1]							1.29	C[1]

		B	C	D	A[1]	B[1]	C[1]	D[1]	
EIGHTH GRADERS N=73	A	2.86b	3.27b	2.84b	1.65	1.15	4.95a	1.36	A
	B		6.20a	0.64	3.97a	1.86	7.58a	3.91a	B
	C			6.49a	1.23	4.47a	2.94b	1.35	C
	D				4.04a	1.34	8.04a	4.17a	D
	A[1]					3.07b	3.98a	0.19	A[1]
	B[1]						7.14a	2.97b	B[1]
	C[1]							3.60a	C[1]

		B	C	D	A[1]	B[1]	C[1]	D[1]	
ELEVENTH GRADERS N=48	A	1.22	1.30	5.76a	1.60	0.37	4.58a	2.47c	A
	B		2.53b	4.94a	2.75b	1.66	5.57a	0.66	B
	C			7.64a	0.40	0.59	3.08b	3.57a	C
	D				6.25a	5.51a	8.86a	4.08a	D
	A[1]					1.03	3.49a	4.01a	A[1]
	B[1]						3.85a	2.18c	B[1]
	C[1]							7.42a	C[1]

a=$p < .001$, b= $p < .01$, c=$p < .05$, two-tailed.

which they are correlated, and b) the t-values themselves can provide an index of the degree of growth that influences the changes in significance levels in Sessions 1 and 2 (as seen in Table 3) by linguistic subset. It is observed, for example, that for all three groups, Syntactic-Anagrams (the third of the four subtests- C and C'-) is easiest for all the groups while the Semantic-Error Detection task (subtest four- D and D') is the most difficult for all three groups. This is not true for all three samples significantly, but it is the general trend.

Heavily shaded boxes in Table 4 emphasize the replication between similar portions of the Hawaiian test between the first and second weeks. It is observed that for the fourth graders, three out of four of the subtests are improved between Sessions 1 and 2, whereas for the eighth and eleventh graders, two of the four subtests are improved. It is never the case that performance on the first subtest- Syntactic-Multiple Choice, or Semantic-Multiple Choice, improves among the two oldest subject groups between Sessions 1 and 2. The inferior performance of the eleventh graders, particularly on the fourth subtest, Semantic-Error Detection, deserves special notice and will be addressed in greater detail in the Discussion chapter to follow.

Table 5 represents the types of errors made by subjects on the Hawaiian test. For this analysis, it was not possible to make meaningful use of the subject's performance on the last two subtests- (Syntactic-Anagrams and Semantic-Error Detection)

Table 5

Mean Proportion Of Syntactic And Semantic Errors On

Fourteen Multiple Choice Items By Three Groups[1]

ERROR TYPE	FOURTH GRADE	EIGHTH GRADE	ELEVENTH GRADE
ITEMS 1-7			
S-V-O	.127 ± .149	.068 ± .087[a]	.060 ± .079[b]
S-V-O Transform	.020 ± .044	.006 ± .028[b]	.006 ± .033[b]
Missing Rule	.312 ± .172	.242 ± .234[b]	.303 ± .184
Direct English	.064 ± .062	.039 ± .055[b]	.050 ± .063
Omitted Syntax	.013 ± .039	.011 ± .040	.025 ± .064
TOTAL SYNTACTIC	.536 ± .197	.366 ± .267[a]	.444 ± .202[c]
ITEMS 8-14			
Missing ma	.080 ± .092	.142 ± .141[c]	.120 ± .127
Missing i	.121 ± .104	.209 ± .216[c]	.172 ± .201
Reversed Locative	.090 ± .100	.148 ± .152	.146 ± .125[c]
Direct to English	.084 ± .097	.199 ± .178	.066 ± .082
Omitted Locative	.089 ± .096	.036 ± .067[a]	.052 ± .072[c]
TOTAL SEMANTIC	.464 ± .197	.634 ± .267[a]	.555 ± .202[c]

[1]Grades 8 and 11 never differed significantly. Footnotes a,b,c refer to significant contrasts between Grades 4 and 8 or Grades 4 and 11.

[a]$p < .001$, [b]$p < .01$, [c]$p < .05$, two-tailed.

because of the tendency, particularly among the younger subjects, to omit items they found difficult. This was especially true for subtest four of the test- Semantic-Error Detection. Such omissions were rare on the first two portions of the test (the 14 multiple choice questions) so that these items provide an equal data base for determining whether the various foils in the multiple choice questions were differentially attractive to the differing age groups.

Table 5 presents the results of an analysis whereby the errors for each subject were proportionalized into the 10 possible kinds of errors that could be made in the multiple choice items, 1-14. What we observe in Table 5 are the proportions of errors over the 10 kinds of errors for each of the three experimental age groups. The contrasts among the three groups leads to certain "patterns" of error-types. First of all, it is more probable for a younger child- namely, a fourth grader- to evidence syntactic rather than semantic errors, while for the older two groups, it is more typical to find semantic rather than syntactic errors.

Second- A review of the 10 possible errors separately by groups revealed that the eighth and eleventh graders uniformly make fewer syntactic errors than the fourth graders. The only exception to this regularity being the last of the semantic errors-omission of the locative. Omission of the locative appears to be a "juvenile-" type error, not replicated by the two

older subject groups tested.

Above and beyond the performance of the three groups of subjects, the question arises whether individual differences within subjects have any influence on test score performance. To this end, 'individual-difference' data were collected in the form of a Questionnaire administered at the close of Session 2 of this experiment (Appendix 3). The data from these questionnaires were then correlated with performance on the Hawaiian test for each of the subjects.

Table 6 indicates overall group correlations of various sources of these individual differences across the sample. The two dependent variables subjected to examination were performance at Session1 and improvement in performance from Session 1 to 2 (subjects' "gain").

As Table 6 indicates, it was found that overall performance at Session 2 was strongly and significantly correlated with performance at Session 1, in a negative direction (the negative correlation indicating that the poorer the subject's performance at Session 1, the greater his/her gain at Session 2).

The sample size of 188 subjects which had obtained for the procedures thus far described, was decreased by 6 fourth grade subjects for the next series of statistical procedures, owing to an excess of missing demographic data which was only discovered after the experiment had been completed.

From Table 6 we discern that some of the basic measures

Table 6

Correlations of Individual Difference Measures
With Initial Scores and Second-Week Gains
For Total Sample (N = 182)

TABLE 2 MEASURES	Initial Scores	Two-Week Gains
Initial Scores	--	-.297[b]
Vocabulary Test	.055	.123
Reading Class	.333[a]	.052
Reading Level	.097	.096
Sex	.018	.056
SOCIO ECONOMIC INDICES		
Dwelling (Owned/Rented)	-.300[b]	.067
Parents (Both Present/1 Absent)	.043	.009
Parent Occupation (7-step scale)	.203[c]	.102
Number of Siblings	-.097	-.043
BILINGUALISM INDICES		
Second Language At Home (No/Yes)	-.094	.084
Degree of 2 Language Use (Low/Medium/High	-.036	.002
Second Language in School(No/Yes)	.560[a]	.056
Duration of Study (Weeks/Months/Years)	.509[a]	.076
ADDITIONAL FACTORS		
Enjoy Travel? (No/Yes)	.020	-.079
Enjoy Foreign Language? (No/Yes)	-.023	.088
Continue Hawaiian? (No/Some/Much)	-.274[b]	.108

[a] $p < .001$, [b] $p < .01$, [c] $p < .05$, two-tailed.

reported in Table 2 correlate with the Hawaiian language test, whereas others do not. The initial performance of subjects turns out to be strongly predicted by the Reading Class of the subjects (higher reading classes performing better than lower reading classes over the three age groups), whereas Sex of subjects has no correlation with performance, and over the three groups, individual Reading-Level does not seem to be relevant; although this lack of correlation between Reading-Level and subjects' performance is potentially misleading since Reading Level was differentially measured in Groups 4 and 8 than 11: grades 4 and 8 reflecting the reading grade level in school grade (year and month) on the Iowa test; grade 11 reflecting the subject's national percentile rank.

Within the socio-economic indices, one notes that higher socio-economic status fosters better performance in Session 1: children who live in houses or apartments owned by their parents performed better than children from houses or apartments that were rented by their parents. Likewise, children performed better if their parents had more prestigious occupations; e.g., professional or business/ executive positions.

In terms of having other languages at one's disposal, there was clearcut evidence over the whole sample that studying a second language in school was beneficial to performance on these tasks, as was being engaged in that formal language study more than just briefly.

Beyond the factors cited, and (potentially) somewhat paradoxically, initial performance was benefited when individuals said they did not want to learn any more Hawaiian, and hampered when the subjects said they did want to learn more Hawaiian. (This apparently 'inverse' relationship between motivation and achievement in second language performance will be discussed more fully in the next chapter.)

In terms of predicting "gain" from first to second week, the singular best predictor for the whole sample was initial scores where something akin to regression toward the mean seems to be taking place; i.e., the best performers at Session 1 improve the least at Session 2. Other than the factors mentioned, no other individual-differences measures seem to be relevant.

An argument could be made that the summarizations in Table 6 are misleading with respect to the potentially differing relations among the different age groups relative to the factors cited in Table 6. In particular, it is clear that the Reading Levels cited in Table 6, as already indicated, were measured differently for the eleventh graders than for the two younger groups.

In order to clarify the relevance of the variables in Table 6 to the performance of the three different age groups, separate regressions were performed for both first and second week's gains as indicated in Tables 7-9. In each of these regressions, the same principles of prediction were followed.

The computer was instructed to find the first significant variable in Table 6 and enter into the regression equation thereafter, in sequence, any succeeding variable from Table 6 which would significantly improve the prediction from the level it had already attained. In this regard, as seen in Tables 7-9, these separate regressions ran in varying numbers of steps, the consequences of each will be reported in turn in tables that follow a standard format for reporting on regression. The columns of these tables labeled "BETA" specify in the final regression equation the proportion of variation, expressed in standard deviation-units terms, that a predicting variable "moves" in proportion to a standard deviation-unit of change in the dependent variable. Thus, by way of illustration, in Table 7- for a standard deviation-unit of growth in initial test score performance, the Reading Class variable grows .4 units of standard deviation. When the regression is completed, one can then specify the proportion of variance each of the variables composes, and can furthermore scale the proportions of variance to 100%, so as to render the regressions comparable to a different set of data with a different sample size.

For the fourth graders, regression for the first week's scores ran four steps; the major predictor being the Reading Class of the subjects, improved upon by two attitudinal variables, and finally, by the degree of second (or first) language use at home. The only paradox in this prediction is the negative

direction of the "Continue Hawaiian" question, op. cit.

In predicting second week gain, as already implied in Table 6, initial score is the prime enterer. Indeed, in all three second-week gain predictions in Tables 7-9, the main enterer, initial test scores, predicts about one-half of the variance that is going to be predicted, always entering in the negative- meaning that the poorest performers in all three groups are gaining the most by the second week; a general phenomenon of regression toward the mean.

In Table 7, for fourth grade subjects, improvements on second-week gains are found in Reading Level, where the better the subject reads in English, the greater his/her improvement in the second week's performance.

Beyond Reading Level, the amount of time the child has spent in studying a foreign language in a school-setting contributes to the prediction of week-two gains. Considering that only nine children in the fourth grade group are studying a language in school at this age level (all nine cases studying Hebrew) it is remarkable to note that almost one-fifth of the explained variance in improvement is accounted for by this factor.

In Grade 8 (Table 8) the first week's scores are predicted from a combination of a "general" reading variable (which Reading Class the subject is in) and a "personal" reading variable defined by his/her individual performance on the Iowa Reading Comprehension subtest. Together, the two "reading" factors

Table 7

Multiple Prediction of Initial Scores and Second-Week Gains By Fourth Graders (N=61)

INITIAL SCORES Variable	Beta	Percent Variance	Percent Explained Variance
Reading Class	.408[a]	10.7	32.3
Enjoy Foreign Language	.299[c]	7.9	23.7
Continue Hawaiian	-.287[c]	7.5	22.7
Degree of Second Language Use	.269[c]	7.1	21.3
Total	R=.576	33.2	100.0

SECOND-WEEK GAINS Variable	Beta	Percent Variance	Percent Explained Variance
Initial Score	-.596[a]	20.7	50.2
Reading Level	.365[b]	12.8	30.8
School Language Time	.225[c]	7.8	19.0
Total	R=.643	41.3	100.0

[a] $p < .001$, [b] $p < .01$, [c] $p < .05$, two-tailed.

Table 8

Multiple Prediction of Initial Scores And

Second-Week Gains by Eighth Graders (N=73)

INITIAL SCORES			
Variable	Beta	Percent of Variance	Percent of Explained Variance
Reading Class	.298	12.6	39.4
Reading Level	.262	11.1	34.6
School Language Time	.197	8.4	26.0
Total	R=.567	32.1	100.0

SECOND-WEEK GAINS			
Variable	Beta	Percent of Variance	Percent of Explained Variance
Initial Score	-.576[a]	14.6	48.2
Reading Level	.313[b]	7.9	26.2
Second Language at Home	.307[b]	7.7	25.6
Total	R=.550	30.2	100.0

[a] $p < .001$, [b] $p < .01$, [c] $p < .001$, two-tailed.

Table 9

Multiple Prediction of Initial Scores And

Second-Week Gains by Eleventh Graders (N=48)

INITIAL SCORES			
Variable	Beta	Percent of Variance	Percent of Explained Variance
Reading Level	.361[b]	12.0	60.9
School Language Time	.232[c]	7.7	39.1
Total	R=.441	19.7	100.0

SECOND-WEEK GAINS			
Variable	Beta	Percent of Variance	Percent of Explained Variance
Initial Score	-.689[a]	21.9	45.3
Reading Class	.335[b]	10.6	22.0
Reading Level	.292[c]	9.2	19.2
School Language	.205[c]	6.6	13.5
Total	R=.695	48.3	100.0

[a] $p < .001$, [b] $p < .01$, [c] $p < .05$, two-tailed.

account for better than two-thirds of the predictions for the eighth grade subjects. The remaining variance is accounted for by the amount of time the child has spent in studying a foreign language in school. (By eighth grade, the majority of the class has already started to study a foreign language; only 7 children are not studying a foreign language in school, and they are clearly the worst performers.)

In examining the gains this group made at the second week, beyond the prediction of what they did at week-one, Reading Level again enters the prediction. The final improvement in the prediction of gain for these subjects was governed by whether or not a second language is spoken at home, which especially selects for superior performance 19 children in this group who had a home-language.

By the eleventh grade, neither of the two dependent factors (Session 1 performance or second-week gain) is as easily predicted as it was for the other two groups. First week's scores are best predicted by the knowledge of the subjects' Reading Level coupled with the amount of time the study has been studying a foreign language in school. By GRADE 11, only fourteen of the subjects are not studying a foreign language in school. Unlike most of the previous regressions, however, the prediction of second-week gain for this group of subjects ran four steps. As usual, the primary predictor was performance at Session 1; jointly improved on by the Reading Class the student was in as

well as by the student's particular Reading Level. Beyond that, the prediction was improved upon by whether or not the student was studying a foreign language in school; the quantity of time spent in studying this language not entering the prediction of second-week gain for these eleventh graders significantly.

In these regressions, subtle but significant distinctions, such as those just implied between the mere presence of a foreign language in school and the time spent in studying that language, can be revealed.

The final analyses examined two anomalous features of this experiment. The Methods Chapter had defined a small sample of 12 GRADE-nine Latin students who were omitted from the main study by virtue of their small sample size and the special fact that they were studying Latin in the ninth grade- a potentially highly "select" group of L_2 learners.

Table 10 provides the means of this sample in a form that is directly comparable to the three experimental groups as presented in Tables 2 and 3. By inspection, the performances of these 12 ninth graders do not differ from those of the seventh and eighth graders. Indeed, formal contrasts between eighth and ninth grade groups never yielded any significant differences. Conversely, as the two other families of tests indicate, the patterns of significant differences between the ninth graders and the fourth and eleventh graders exactly match those reported in Table 3 for the eighth graders. Via the criteria of nine different tests, it

Table 10

Performances of the 12 Ninth Grade Latin Students
Broken Down By Linguistic Sector and Day of Testing
And Contrasted With The Three Experimental Groups

		Vs Fourth	Vs Eighth	Vs Eleventh
INITIAL SCORES				
Items 1- 7: Syntactic Multiple Choice	3.33 ± 2.50	b	--	--
Items 8-14: Semantic Multiple Choice	2.92 ± 2.50	a	--	--
Items 15-21: Syntactic Anagrams	4.25 ± 1.14	a	--	--
Items 22-28: Semantic Error Detection	3.58 ± 1.50	a	--	a
SECOND-WEEK SCORES				
Items 1- 7: Syntactic Multiple Choice	5.42 ± 1.44	a	--	c
Items 8-14: Semantic Multiple Choice	3.58 ± 1.83	a	--	--
Items 15-21: Syntactic Anagrams	5.50 ± 1.78	a	--	--
Items 22-28: Semantic Error Detection	4.67 ± 1.72	a	--	b
Vocabulary Test	9.17 ± 4.75	--	--	--

[a] $p < .001$, [b] $p < .01$, [c] $p < .05$, *two-tailed.*

is remarkable to assert that these twelve ninth graders do not differ significantly in performance from the 73 eighth graders who participated in the main study.

Finally, as indicated at the start of this chapter, the 20 subjects who were not present for the first week's administration of the Hawaiian-language learning task were subjected to analysis: 5 fourth graders, 10 eighth graders and 5 eleventh graders. Table 11 presents the means for their performance on the Vocabulary Review test, without any aids or prior exposure to Hawaiian, and their performance on the Hawaiian test, with only the "rules" to guide them. The performances of these three groups of "Session 2-only" subjects are interesting in two respects: first, in terms of within-group comparisons of performance by age, and second, in terms of their performance against their original grade-reference groups in the main study.

Table 11 demonstrates that the performance on the learning tasks increased with age in a regular fashion. Indeed, none of the three age groups in the "Session 2-only" sample differed significantly from their adjacent age groups in the main study; however, the two extremes of "2-only's-" fourth and eleventh graders, did significantly differ from each other ($t = 2.96$, $p < .018$). Thus indeed, it is fair to say the eleventh graders procurred more benefit from the rules alone than the fourth graders did.

Contrasts were made between these small samples of

Table 11

Performance of 20 Second-Week– Only Subjects

	Vocabulary Test	Hawaiian Test
Fourth Graders N=5	5.00 ± 1.87	6.40 ± 3.21
Eighth Graders N=10	3.50 ± 1.08	9.20 ± 5.59
Eleventh Graders N=5	5.00 ± 4.30	14.40 ± 5.13

"2-only's" and the larger groups from which these samples were drawn (by grade and class)- those present at Session 1 also. For neither of the small samples of fourth and eleventh graders (5 subjects per grade) were any significant differences found, but for the eighth graders, where 10 subjects were available for contrasts against 73 in the main experiment, a significant difference was found both in the Vocabulary Review test and in performance on the Hawaiian test. The 10 "2-only" eighth grade subjects do substantially more poorly than the eighth graders in the main experiment. The differences in performance between these two populations of eighth graders yielded *t*'s of 3.67 and 2.77 on the Vocabulary Review Test and the Hawaiian test ($p < .001$ and $p < .007$, respectively).

Thus it may be concluded that, in the middle group of eighth graders, the first week of formal instruction in Hawaiian benefited them more than just having access to the rules alone.

Apart from statistical procedures just described, a post-hoc analysis of the data was made based upon an examination of the frequency of responses on the Multiple-Choice items (1-14) (Appendices 7/8). Subjects' choices revealed certain patterns of responses beyond the individual item-errors previously delineated in the author's coding of the error types. (See Appendix 3.) Such regularities in response, or response-biases, may be considered "strategies" of L_2 learning- within the confines of

the experimental conditions already discussed; i.e. at the initial stages of L_2 learning, in a formal classroom setting, etc.. The following discussion of L_2 strategies will be limited to incorrect responses since correct responses may be accounted for by a) learning, and/or b) guessing.

In items 1-7, for example (Syntactic-Multiple choice), there was a uniform strategy across all Subject-Age groups tested with regard to the overwhelming preference for a "type-3" error on those items numbered 1, 3, 4, 5, and 6 (See Appendix , pp. -). It is apparent that when subjects were confronted with such transitive Hawaiian sentences, a strategy of direct mapping of the English command form onto the Hawaiian transitives took place such that English/Hawaiian parallels in word-order; (delected-S)-V-O, were sought out. Simultaneously, a strategy of elimination of the assumed-to-be redundant marker of objectivity ("i") was evidenced since subjects consistently chose the unmarked over the marked form of such sentences. In the case of items 4 and 6, for example, the type-3 error minus the "i" object-marker was a more popular response than the correct response for all age groups tested (see Appendix , p.). Thus, we see evidence for a strategy of positive transfer from L_1 (direct mapping of word-order rules) and negative transfer from L_1 (elimination of the direct-object marker, "i") in the subjects' responses on syntactic items.

With regard to items 2 and 7, the Hawaiian statives, the

popularity of error type-1 (n of responses = 82Ss and type-4 (n of responses = 79Ss) gave evidence for a strategy whereby subjects chose to reverse the Hawaiian subject/ object relationship and to "front" the noun when confronted with such stative forms. Thus, we see the subjects' reliance upon a canonical word-order strategy when faced with sentence structures that are not available in her/his native langauge; e.g., a "verb-first" stative, or truncated passive, which is not possible in L_1-English.

As can be seen in Appendix , type-3 and type-1 errors in items 1-7 account for all but nine percent of the subjects' responses on the Syntactic-Multiple-Choice subtest.

With regard to Semantic strategies across items 8-14 in the Multiple-choice subtest, the picture is not quite as clear as it was for the Syntactic items. First, it is apparent that there is a regular growth of "no-response" in items 8-14 as compared to items 1-7; an index of the difficulty subjects experienced with semantic vs. syntactic items over all. Second, there is a lack of uniformity in error patterns across the age groups as was the case for the seven syntactic items (see Appendix , pp.)

For the two older groups (GROUP 8 and GROUP 11), there was a strong bias towards a type-3 error on items 8 and 10; a bias towards a type-1 error on items 12 and 14, and a trend towards a type-2 error on item 13. These three error types may be viewed together as a strategy of (Semantic) locative/ rule-over-

generalization in that the locatives "i" and "ma" were freely reversed and substituted for one another among the older subjects tested.

On the other hand, it is clear that the younger subjects (GROUP 4) had a bias toward a type-5 error (omission of the locatives) or "no-response" on items 8-14. Such a strategy may be termed an "avoidance" strategy when the L_2 learner (in this case, the younger L_2 learner) must choose among semantic distinctions that are not (yet) present in the learner's lexicon. Since it is apparent that such age-dependent strategies did emerge in the Semantic-Multiple choice items, but did not emerge in the Syntactic Multiple-Choice items, these data suggest that semantic strategies at the initial stages of L_2 learning may have been more developmentally constrained; whereas, syntactic strategies at the initial stages of L_2 learning may have been more influenced by first language transfer-positive or negative-across the age-groups tested.

CHAPTER V

DISCUSSION

The results presented in the previous chapter will now be discussed in response to the series of issues raised at the beginning of this dissertation.

Question 1- Are there findings which suggest that AGE alone may account for a learner's ability to acquire aspects of a non-native language?

Results of the statistical analyses described in Chapter IV indicate a significant advantage for the two older groups of subjects (J.H.S. and H.S.) over the fourth grade elementary school subjects in overall test-score performance. In particular, the J.H.S. students evidenced consistent superiority over the fourth grade students (at both test sessions, and across all four subtests). This general finding supports the 'older-is-better-for-syntax-and semantics' positions of Fathman, 1975; Ramirez and Politzer, 1978; Snow and Hoefnagel Höhle, 1978, and Weber-Olsen and Ruder, 1980, previously cited in this study.

The H.S. students, however, were not as uniform as the J.H.S. students with regard to their superiority over their younger counterparts. In this respect, it should be recalled that test scores on the Semantic-Error Detection task did not discriminate fourth from eleventh grade subjects- at Sessions 1 and 2, $p < .10$; nor were the eleventh graders ever more successful than

the seventh/eighth graders on any of the Hawaiian subtests at either test session. Indeed, the J.H.S. subjects were significantly better than the H.S. subjects on two of the four subtests (Syntactic-Anagrams and Semantic-Error Detection) at Session 1.

The superior performance of the J.H.S. students relative to the H.S. students evidenced in this experiment is consistent with the "teenage-ceiling effect" encountered by Snow and Hoefnagel-Höhle, 1978, op.cit.; Ramirez and Politzer, 1978, and Bialystok, 1979. This "effect" may be explained in one of two ways: either *there is something exceptional about the J.H.S. students tested here which produces a "peaking-up" in second language learning capacities in formal settings at J.H.S. age, or, conversly, there is something exceptional about the H.S. students tested here which produces a "leveling-off" in second-language learning capacities in formal settings at H.S. age.*

Because of the controlled, experimental nature of this L_2 learning experiment, variations in subjects' performance cannot be attributed to external social and communicative pressures to acquire this second language, since the present experiment was not based on a language already "in use." Additionally, there were no significant correlations noted in the present study between any of the motivational factors addressed (enjoyment of foreign languages, enjoyment of foreign travel, etc..) and test-score results within the two older groups tested (p.90). This

latter finding is in concert with other authors previously cited who have found a similar lack of relationship between measures of language 'aptitude' and measures of language 'attitude' among groups of adult and young adult L_2 learners (Bialystok, 1978; Burstall, 1979).

However, before we suggest that the results of the present study with respect to J.H.S. vs. H.S.-age differences in performance support the neurophysiological explanations of a post-pubertal "fall-off" in second language learning capacities, much greater consideration must be given to other factors, not previously addressed in this study, which might better account for such H.S. vs. J.H.S. differences. For example, it may be that the H.S. subjects were under-stimulated by the language-learning activity itself, or they may have been preoccupied by more meaningful academic pursuits- the Hawaiian sessions having occurred just prior to New York State Regents Examinations and school-wide final examinations. The eleventh graders' poorer performance relative to the seventh/eighth graders' performance would also have to be replicated by the performance of other adult language learners on this task (college-level students, working class adults, etc.) before the experimenter could rule-out the possibility that these J.H.S. vs. H.S. results were not just a one-time, local performance effect.

A final note about the "Age-Effect" per se: in one respect, the younger group <u>was</u> superior to both of the older groups

tested. It will be recalled that although all three groups improved considerably in non-significant parallel ranks from Session 1 to 2, the fourth graders, unlike the two older groups, evidenced significant improvement in three of the four Hawaiian subtests from Session 1 to Session 2; Semantic-Multiple Choice, $p < .001$; Semantic-Error Detection, $p < .001$, and Syntactic-Anagrams, $p < .05$, the negative t-value indicating that the lower the subtest scores in Session 1, the greater the improvement in subtest scores in Session 2. The fourth graders' improvement was such that subtest responses that were 'at' or 'below-chance' on all four subtests at Session 1 advanced to 'above-chance' at Session 2; the greatest improvement occurring in the Semantic-Error Detection task.

There are several ways to account for the fourth graders' remarkable performance gains between the two test sessions.

One- Results have shown that approximately 20% of the fourth graders' responses at test-Session 1 were omitted- particularly within the last two subtests. Thus, any attempt by the fourth graders even to answer the questions would represent a considerable improvement in performance (at least for the multiple-choice items, 1-14 and 22-28, the subjects had a one-in-four chance of guessing the answer correctly).

Two- Familiarity with the tasks and the Hawaiian language, added to the subjects' anticipation of receiving their rewards at the end of Session 2, might have reduced the fourth graders' test

anxieties sufficiently to permit them to attend more fully to the stimulus and response materials at Session 2.

Indeed, Flavell (1982) has suggested that one of the potential sources of "homogeneity" in child vs. adult learning situations ". . . might result from age-correlated limitations on the child's functional information-processing capacity (which, in turn, might) restrict the range of problems (the child's mind) can deal with" (p.5). Flavell further suggests that one way for the child to overcome these limitations in short-term memory capacities would be through ". . . familiarization and practice, (which) could effectively augment her overall processing capacity" (Ibid.).

Three- It may be the case that, contrary to some L_2-learning theories (Krashen, 1976; Morris, 1978), the younger subjects may have benefited more than the older subjects from having explicit linguistic rules made available to them at Session 2; particularly with regard to the more complex Anagrams and Error Detection tasks. This issue will be considered more fully in discussing the "task-effect" later on in this chapter. However, with respect to these "unexpected" findings among the fourth and eleventh grade subjects tested, the difficulties arising from the experimenter's attempt to create a language-learning experience that would not over- or under-tax subjects across a wide range of ages and interests needs to be mentioned as possible contributor to some of these experimental outcomes.

Question 2- Are there findings which suggest that the three groups of L_2 learners differed with respect to the linguistic subset (syntactic or semantic) being assessed?

As this Discussion Chapter will later reveal, the Syntactic-Anagrams and Semantic-Error Detection tasks were in no way comparable; either when compared to each other, or when compared to linguistically related syntactic and semantic items on the Multiple Choice subtests. Therefore, the following discussion of subjects' performance across linguistic domains will be limited to the first part of the Hawaiian test- Syntactic-Multiple Choice (items 1-7) and Semantic-Multiple Choice (items 8-14) across Sessions 1 and 2, since the results for these items were less confounded by the effect of task on subjects' responses.

As was noted in Chapter IV, there were no significant differences in terms of mean number of correct responses on Syntactic vs. Semantic Multiple Choice items for the fourth graders at Session 1; nor for the eleventh graders tested. However, the J.H.S. subjects did perform significantly better on the Syntactic-Multiple Choice items than on the Semantic-Multiple Choice items in Session 1. Fourth grade subjects' performance improved significantly between Sessions 1 and 2, such that the gain in correct Semantic-Multiple Choice items (.76 items) was significantly greater than the gain for Syntactic-Multiple Choice items (.15 items). No such significant differential

improvement in Syntactic vs. Semantic Multiple Choice test scores was noted for either of the older groups between Session 1 and 2.

Since the stereotypy of subjects' responses over test Session 1 and 2 could confound the interpretation of results, an examination of the relative proportion of error types by linguistic subset was confined to Session 1 test responses only. The analyses of error-types revealed that fourth graders had a significantly higher proportion of Syntactic-Multiple Choice errors in Session 1 (54%) compared to Semantic-Multiple Choice errors, while the older subjects evidenced fewer Syntactic (vs. Semantic) Multiple Choice errors in Session 1 (37% and 44% respectively for J.H.S. and H.S. age subjects). Are there developmental factors which might account for these subtle, age-related discrepancies in the learning of syntactic vs. semantic aspects of a second language?

Bowerman (1981) has suggested that ". . . the ability to extract underlying lexicalization patterns on the basis of exposure to the words of a language diminishes with age or with prior experience with another language" (p.185). Adult L_2 learners, therefore, would be expected to have a more ingrained set of expectancies about how to relate sound and meaning in an unknown language. Such an age-related constriction in the learner's semantic field, coupled with the learner's search for

lexical equivalents in native and target languages, might lead to an over-generalization of certain lexical items; or to an inappropriate choice of lexical items when a selection restriction in the target language would make that lexical choice incorrect. (For example, the confusion which results from Dutch/English attempts to "cross-over" the verbs "lend" and "lenen," producing utterances such as "Mary lent a book from John." (Bowerman, 1981, p.187).)

A similar pattern of over generalization and/or violations of selection restrictions in the target language may explain the older subjects' higher proportion of errors on the semantic items in the present study; the J.H.S. and H.S. age subjects both evidenced significantly more inappropriate uses or reversals of the Hawaiian locatives "i" and "ma" than the fourth grade subjects tested, while the fourth grade subjects more commonly omitted the locatives altogether.

A parallel developmentally-based pattern with regard to assigning the correct meanings to English locative prepositions has been observed in the language of the deaf. Kluwin (1979), for example, has proposed the following model of preposition development in deaf children (pp.16-18). In stage I, prepositions are deleted when the verb ". . . contain(s) a semantic feature that makes the preposition semantically redundant but structurally necessary" (p.17). Much the same strategy of omitting redundant functors has been observed in normal first-language acquisition.

Ervin-Tripp (1973), for example, has noted that while function words (such as prepositions) may be an aid to comprehension, (e.g., in "marking form classes unambiguously"), they are not (necessarily) an aid to production- "hence, their omission-and the resulting telegraphese" (p. 283). Ervin-Trip also suggests that functors may be eliminated by young language-learners for another, quite opposite reason (which might apply more directly to the learning conditions of the present experiment): when the functors are very complex- ". . . the time required for acquisition might make then unavailable for conditions of brief acquisition. . . such as pidgins" (p.284). Such may have been the case for the fourth grade subjects tested here.

The second stage of Kluwin's model involves the adding-on of semantic functions of the prepositions. Often, the older deaf child or adolescent will rely on the 'general' function of a preposition (e.g., the locative meanings of "in," "at," and "to") and use these locatives in "free variation" with one another whenever a preposition is required-without regard for the semantic distinctions between motion, position in space, etc. which each locative entails. As Kluwin states, "Since the major definable features for these prepositions are often identical, and the basis for selecting different prepositions is based on smaller and often subtle distinctions, it is apparent why deaf children have problems when they use these prepositions" (Ibid., p.11). Kluwin's proposed stage II for the acquisition of the

semantic categorization rules for English prepositions among deaf children might well apply to the confusion evidenced by the older subjects tested in the present study as we view their attempts to assign the correct locative meanings to the Hawaiian prepositions "i" and "ma".

Conversely, the younger subjects' poorer performance on the Syntactic-Multiple Choice items may have developmental roots as well. Bowerman (1981) has noted that children, and to a lesser extent, adults, acquiring language may be hampered by an inability to "shift perspective" (pp.182-183) with respect to the semantic-agent/patient relationships and the syntactic- subject/object relationships within sentences. For example, English gives the speaker a choice of perspectives ("Mary" or "Susan") by offering the following sentential choices: 1. Mary bought a dress from Susan, or 2. Susan sold a dress to Mary. Specifically, "Those entities referred to by the noun phrases functioning as subject and direct object of the verb are perceived as 'in perspective,' whereas entities mentioned only as oblique object or entirely omitted are, relatively speaking, 'out of perspective' " (Ibid., p. 182). We know from prior studies of child first-language acquisition that the ability to "shift perspective" arrives relatively late in the developmental sequence (Bever, 1975; Bloom, Lifter and Hafitz, 1980), and that ". . . the child's growing awareness of syntactic structures as a device for conveying perspective" (Bowerman, 1981, p.182) continues to improve through

the middle childhood years and beyond.

The fourth grade subjects' poorer performance on the Syntactic-Multiple Choice items may, indeed, reflect their inability to "shift perspective," since the Hawaiian transitive sentence contains a subjectless verb, and the Hawaiian stative sentence contains a truncated passive with a deleted subject and an "oblique" direct object. This may also account for the younger subjects' significantly greater reliance on a S-V-O, canonical word-order strategy in interpreting Hawaiian sentences. (The question of whether or not the Hawaiian stative is closer to the state-aspect of predicate adjective sentences, such as- "The car is gone," or closer to truncated passive sentences such as "The whistle was blown" in English will be more closely examined later on in this chapter.)

A final comment about syntactic vs. semantic differences among the subject groups- It has already been demonstrated that the J.H.S. subjects evidenced considerable performance superiority over the H.S. subjects tested. Nevertheless, it is important to note that this superiority was reduced in both syntactic subtests- Anagrams and Multiple Choice- from Sessions 1 to 2, to the point of non-significance. It is possible that the eleventh graders benefited more than the seventh-eighth graders by having an explicit statement of syntactic rules in front of them at the second test Session. What is somewhat surprising, however, is that the presence of such explicit linguistic rules did not help

these H.S. students as much with respect to the Semantic-Error Detection task, where the J.H.S. students maintained their strong performance edge over the H.S. subjects at test Session 2.

Question 3- Are there findings which suggest that the three groups of L_2 learners differed with respect to the linguistic vs. metalinguistic demands imposed by the tasks?

The issue of the effect of metalinguistic complexity on test-score performance in a second language cannot be resolved on the basis of the results of this study. On the one hand, there is clear support for age-related limitations on metalinguistic capacities as suggested by the results of the Semantic-Error Detection task. This subtest was significantly more difficult for the fourth graders than the Semantic-Multiple Choice task in Session 1 and 2. Surprisingly, the eleventh graders also found the Semantic-Error Detection task to be significantly more difficult than the Semantic-Multiple Choice task in Session 1.

One could propose that the relatively poor performance evidenced by the fourth and eleventh graders on the Error Detection task was to be expected, since researchers in both first (Hakes, 1980) and second (Bialystok, 1979) language have suggested that the detection of anomalous sentences (or, acceptability judgments) may be one of the last-mastered and most complex of the metalinguistic skills. Indeed, Bialystok (1979) has shown that even adult L_2 learners find it significantly

easier to detect correct answers than incorrect answers in a grammaticality judgment task (p.89).

If this is the case, how do we explain the unexpectedly high performance of the J.H.S. students, who found the Semantic-Error Detection task "easier" than the Semantic-Multiple Choice task in both Sessions 1 and 2? It is possible that the group of seventh/eighth graders tested here are, indeed, "special;" that they are a particularly 'school-wise' population such as has been characterized by Flavell (1982): such learners ". . . will consistently interpret all problems as (italics) problems (since they have) very well developed schemas for school-type problem-solving situations" (p.5). Perhaps the J.H.S. subjects tested here represent such a group of "school-wise" children, whose superior performance over both their younger and older counter-parts is closely linked to their ability to engage in formal, classroom-style tasks and "games-" including Hawaiian language tests.

Comparisons of the subjects' performance on the syntactic tasks: Anagrams and Multiple Choice, indicated even greater divergence from the hierarchy of difficulty set forth in the Methods Chapter of this dissertation. Results indicated that, except for the fourth graders' performance at Session 1, all three subject groups tests found the Anagrams task to be less difficult than the Multiple Choice task across both test Sessions. How may we account for this apparent 'reversal' in the expected

trend toward difficulty ordering in the Syntactic subtests?

A re-examination of the Multiple Choice questions- both syntactic and semantic- suggests that the Multiple Choice items may have been more difficult for the subjects than had been originally anticipated. What was designed as a relatively straight-forward comprehension task may not have been so straight-forward after all. It is possible that these fourteen Multiple Choice items contained a "hidden agenda"- a synonymy judgment task as Hakes (1980) has defined it: ". . . to complete a synonomy judgment requires (the subject to) compute and retain representations of the sentences' meanings, and further utilize their representations in a comparison and decision process" (p.23). Is it not the case that the ability to match (or, translate) correct sentences across native and target languages, which is what was required of the subjects in this experiment, is parallel in metalinguistic effort to the ability to engage in a synonomy judgment task in one's native language (e.g., recognition of active/passive paraphrases)? If so, this would make the multiple choice items ". . . much more complex than just a comparison of the semantic (or syntactic) representations of two sentences" (Hakes, 1980, p.23).

The unexpected reversals in the difficulty-orderings established by the experimenter at the beginning of this research speak to the problem of the experimenter's inevitable lack of control over which tasks particular groups of subjects will or

will not find 'difficult' to execute. Similarly, statistical procedures invoked to assess task difficulty by "SET-" I ("rote" memory), II ("re-arranged" memory), and III ("rule" application) produced no significant advantages or disadvantages for any of three "sets," across age groups, tasks, or test sessions. As the next part of this discussion will detail, subjects' choices were more apt to depend on the "seductiveness" of the item-foils in determining patterns of errors within and across subject groups.

As a post-script to the "task issue" relative to the "instructional issue-" the most significant improvements in test score performance from Session 1 to 2 among all three subject groups occurred on the Syntactic-Anangrams and Semantic-Error Detection tasks. This suggests that the more complex meta-linguistic skills may be more readily improved if the learner has access to explicit rule-statements against which (s)he can measure his/her own choices or output- rules such as those made available to the subjects in this experiment at Session 2. This finding suggests that the benefits of formal, deductive, explicitly stated rules for L_2 learners may be more task-dependent than they are age-dependent, as has been previously assumed (Krashen, 1976).

Question 4- Are there interference factors which account for differences in subjects' L_2 performance?

Once again, the discussion of significant differences in error patterns in subjects' responses will be confined to the first fourteen Multiple Choice items (syntactic and semantic) for reasons previously described (p. 86).

A frequency distribution over the whole sample indicated that, within the Syntactic-Multiple Choice subset, the most probable error for items 1-7 was a "type 3" error in which the wrong rule for a Hawaiian sentence (either stative or transitive) was imposed, accounting for 28.2% of subjects' responses sample-wide. A 'strong minority' error was a "type-1" error (8.7% of subjects' responses) which involved the imposition of a canonical S-V-O word order on a transitive or stative Hawaiian sentence, including an accompanying subject-object reversal. Examples of "type 3" and "type 1" errors appear below:

English sentence	Hawaiian sentence (correct)	Error Sentence (and type)
Go to Mama.	Hele aku i Mama.	(type 3) Hele aku Mama. (Wrong rule; stative used instead of transitive.)

		(type 1) Mama i hele aku. (S-V-O order imposed on HWN. transitive with subject/object reversal.)

There were no significant deviations from this general pattern of errors among the bilingual subjects in any age group.

On the surface, the popularity of the type-3 error might be more readily attributed to a lack of familiarity with the Hawaiian rules for signalling changes in aspect and tense through the use of the particle, "i," - due mainly to their limited exposure to the Hawaiian language. However, if we are to search for "transfer effects" at a deeper level of analysis as Bates and MacWhinney (1981) have suggested, it is possible that negative transfer from English into Hawaiian may have been responsible for the relative popularity of the type-3 error on the Syntactic-Multiple Choice items.

"English," as Bates and MacWhinney (1981) have noted, "is known to be one of the most rigid word order languages in the world. S-V-O order is followed in main clauses and subordinate clauses, in questions (except for the fronted auxiliary) and declaratives, and in actives ans passives alike" (p.195). On the strength of word order alone then, Subject/Object; Agent/Patient relationships may be 'taken for granted' by English speakers. Like Hawaiian, however, direct objects may sometimes be signalled by preposed "particles" (prepositions) as in "Please write to me." It is often the case, however, that such redundant markers of objectivity may be deleted by English speakers (e.g., "Please write me."). The misguided presumption that such optional D/O markers may also be eliminated in other languages ("to" = "i") may have been responsible for the popularity of type-3 errors in the present experiment.

Apart from the suggestion of interference-type errors in subjects' syntactic responses, results also indicated that there are significant age-related differences in error types. The predominance of syntactic vs. semantic errors in the fourth grade subjects' responses has already been discussed (pp.86-87). Within these syntactic errors, however, the proportion of "type-1" errors is significantly greater among the fourth graders than it is among either of the two older age groups.

Roeper, Lapointe, Bing and Tavakolian (1981) present developmental evidence that "early (adjectival) passives are indistinguishable from predicate adjectives" in English (p.39): "We take the common view that the stative reading corresponds to an adjectival passive and the active reading to be a verbal passive" (Ibid., p.40). According to these authors, the 'stative' reading is developmentally earlier and more persistent than the 'active' reading in such sentences as: "She saw the broken toy," vs. "She saw the toy broken," where the pre-kindergarten child will typically interpret the verbal passive as an adjectival passive in a picture-verification task (Wattman, cited in Roeper et al, 1981, p.40). Indeed, Roeper et all suggest that such aspectual misreadings of passive constructions may occur in children as old as fourth grade (p.51).

As has already been suggested, the reversion to a canonical S-V-O-word-order strategy with its accompanying Subject/Object reversal, may be developmentally constrained by the inability of

the fourth grade subjects to "shift perspective" (op.cit.). Additionally, the prevalence of "type-1" errors among these younger subjects may reflect an "unstabilized" verbal passive in the child's first language (English) which, as Roeper et al suggest, may likewise be developmentally constrained, or age-dependent.

Although the Syntactic-Anagrams subtest was not included in the statistical procedures previously described for reasons already cited (p.85), it is revealing to note that subjects' responses also gave evidence of both 'interference' and 'developmental' - type errors on this task. On the one hand, for the three Hawaiian stative sentences requested (items 16, 18 and 19), the majority of children across age groups chose to re-arrange these adjectival passives into noun-first, English-style S-V-O constructions; "Hele aku Makua" becoming "Makua hele aku," etc.. This result is in line with Bates and MacWhinney's (1981) "Competition Model" of interference whereby, ". . . the fastest and clearest (correct) responses (would be) obtained "whenever subject/agent/and topic "converge" (in L_2) with respect to L_1 (p.200). Indeed, the fewest number of errors occurred in the Syntactic-Anagrams task when the subjects were asked to re-order Hawaiian transitives (items 15, 17, 20, and 21), which closely resemble English imperative sentences; while the greatest number of incorrect sentences was produced on the Hawaiian statives, which are in "competition" with L_1 (English) relative to the

children's expectations of subject/agent/and topic relationships.

However, fourth graders typically made errors on the "easier" Hawaiian transitive sentences, too. What is most interesting is the nature of these fourth grade errors on items 15, 17, 20 and 21 of the Anagrams task. They were, for the most part, what one might regard as linguistically "primitive" responses, since they involved the separation of the noun from its particle ("ka" from "lole," etc.). At least in the present study, the fourth graders' responses on this Syntactic-Anagrams task give support to the view that the ability to induce linguistic rules, such as "noun is preceded by its noun-marker-" may be age-related. Caramazza and Zurif (1978) have suggested that such strategies as ". . . violat(ing) the linguistic unity of the noun phrases of sentences" are typical of young language learners who ". . . first use strategies that depend on semantic plausibility to assign a reading to a sentence and only later develop cognitive operations that are independent of semantic plausibility to assign grammatical relations to sentences" (pp.148-149).

Explanations for the age-related differences in syntactic vs. semantic multiple choice responses have already been offered, particularly with respect to the older subjects' proportionally poorer performance on the Semantic-Multiple Choice items (pp.105-106). What remains is to account for the significantly greater use of a "type-4" error (omission of the locatives) in the fourth graders'

responses to items 8-14; the Semantic-Multiple Choice test.

Slobin (1973) has defined several "operating principles" or strategies which aid the language acquisition process. Two such strategies are: "Underlying semantic relations should be marked overtly and clearly," (p.202), and "The use of grammatical markers should make semantic sense" (p.206). The question might be raised- Why didn't the fourth graders tested here take advantage of the semantically salient and overtly marked differences between the Hawaiian locatives "i" and "ma" in the present experiment, choosing instead to omit them?

One possible explanation may be that the younger subjects confused the dual functions of "i" as functor or locative, having already decided that grammatical-"i" was redundant, and therefore, deletable. Kernan (1969), in his study of first language acquisition in a language closely related to Hawaiian, Samoan, notes that functors (either as locatives or grammatical particles) are almost universally absent in the speech of Samoan children, age 2-2½, except for the use of occasional nominalizers such as "o" or "le" (pp.35; 119). Such omission strategies, therefore, may be developmentally constrained.

Caramazza and Zurif (1978) have proposed an "autonomous" model of comprehension based on the notion ". . . that syntactic operations can be disassociated from semantic inference systems" (p.148). Scholes (1978), in a test of lexical ambiguities-processing among various groups of normative and non-normative

child and adult populations, has shown that "the lexical (semantic) aspect of comprehension is well-established by (5 years)" and that, "the acquisition of the ability to utilize syntactic formatives in comprehension occurs between 5 and 9 years of age" (p.180). It is possible that the fourth grade subjects tested here were right "on the brink" (developmentally) of the clear separation between syntactic and semantic functions of the lexicon, as Scholes' model would suggest; hence, the source of their errors.

The first chapter of this dissertation has raised the question of the primacy of interference vs. developmental factors in child L_2 learning. Results of this study have shown that certain strategies of L_2 acquisition may be more prevalent among different age groups at the initial stages of L_2 learning. For example, it is apparent that developmental factors played a greater role than transfer factors in the younger childrens' responses to the Semantic-Multiple Choice subtest, where a more 'primitive' error-pattern (omission of the locatives) predominated among the fourth grade subjects tested. It was also apparent that such age-related response biases did not predominate in the Syntactic-Multiple Choice subtest, where a strategy of L_1 transfer was more strongly in evidence across all three age groups. These results have shown the need to examine the issue of 'strategy-dominance' (e.g., interference- vs. developmentally-based response biases) among various groups of

L_2 learners as a function of the linguistic sub-set being assessed--syntactic or semantic.

Question 5- Are there individual differences, apart from subjects' age, which may account for variations in L_2 test-score performance?

Several potential sources of variability in L_2 performance have been put forth in the present study; variability which may be due to differences in Sex, Reading Level/Academic Standing, Attitude and Motivation, Bi- Multi-lingualism and Socio-Economic factors. These factors were allowed to enter competitively into multiple regression analyses to determine which, if any, of these several factors would contribute most to test score performance; either at Session 1 or at Session 2 (as measured by degree of "gain" from Session 1 to Session 2).

Results of the statistical procedures described in Chapter IV indicated that the consistent 'best' predictor of success at Session 1, for all three age groups tested, was the subject's Reading Class and/or Reading Level, as determined by the Reading Comprehension subtest of the Iowa Tests of Basic Skills.

In addition, among the two older groups tested, one other component of academic ability was seen to affect test score results significantly, and that was the presence of formal instruction in a foreign language in school; either in the amount of time already spent in such instruction (School language-time) or in just the presence of foreign language instruction itself

(+ School language).

In analyzing which factors best predict a subject's improvement or "gain" from Sessions 1 to 2, the highest predictor of success at Session 2 was the subject's performance at Session 1; for grades four, seven/eight and eleven. Once again, the high negative correlation suggests a tendency toward regression to the mean on the second week's performance; the poorer the performance at Session 1, the greater the improvement by Session 2.

Apart from Session 1 performance, the core of academic skills- Reading Class, Reading Level, School language and School language time, were, again, the strongest predictors of improvement from Session 1 to Session 2, among all three groups of subjects.

This finding is in agreement with those L_2 researchers who have found a similarly strong relationship between "cognitive/ academic language proficiency" in one's native language and success in second language learning in formal environments (Cummins, 1979; 1980). These findings are also in agreement with those authors who have suggested that knowledge of a second language predisposes the learner to acquire a third language more readily (Genesee, Lambert and Tucker, 1978).

At several points in this discussion, the "special" performance of the J.H.S. age group in this study has been addressed. Nowhere is their "exceptionality" more evident than in the

relationship between native-language proficiency and test-score results in the present study. In the course of summarizing these data for the regression analyses to follow, a comparison of the two groups of subjects for whom the experimenter had parallel sets of individual Reading Comprehension (Iowa) Test Scores by grade-level/ year and month (Grades 4, 7 and 8) revealed that the fourth graders were reading, on average, at grade 5.7, while the 7/8 grade group was reading, on average, at grade 11.1.

This study has shown that, beyond "age," individual as well as group differences in native-language academic proficiencies and skills do contribute significantly to a person's ability to achieve success in learning another language. Relative to the broad discrepancies in Reading Level between fourth and seventh/ eighth grade subjects cited above- one must also acknowledge that differences between individual schools and school systems, particularly in the academic standards they may use to place students "homogeneously" by ability levels, may seriously confound any experimenter's attempt to assess the separate effects of age, reading level, etc. on L_2 performance across any and all school-age populations.

Apart from the "core" academic factors which predicted a learner's performance in this experiment, other individual differences were seen to affect test score results at Session 1- but, for the fourth grade subjects only. These factors included

1) whether the subjects enjoyed learning foreign languages, and 2) the amount of time they spent speaking another (first or second) language at home. If we consider these factors collectively as an index of essentially attitudinal variables which might predispose the learner to have a greater interest in learning another language, these results would then coincide with the findings of other researchers who have shown that achievement in young-child second language learners is more closely linked to language 'attitude' than 'aptitude' (Tucker, Hamayan and Genesee, 1976).

Alternatively, these factors may be considered outgrowths of the "bilingual state" described by Lambert (1981, op.cit.) which produces a positive attitude toward further language acquisition, and/or the "linguistic sophistication" required to succeed in second/third, etc., language learning activities- particularly among younger bilingual subjects such as the fourth grade subjects tested here (of the 57 fourth grade subjects used in the regression analyses, 25 of them came from bi- or multi-lingual backgrounds). The same can be said for the improvement in prediction of second-week gains with GROUP-8 subjects due to the presence of a language (besides English) at home.

The other factors mentioned- differences in Sex and Socio-Economic factors- did not contribute significantly to the predictions of test-score performance within any of the three experimental age-groups (except for some overall correlations of

Session 1 performance with parental occupation and home ownership); nor did the Vocabulary Review test at the beginning of Session 2 correlate significantly with test-score performance. This latter finding, coupled with results that indicated a parallel improvement in overall test score performance between Sessions 1 and 2 across the subject groups, indicates that potential differences in short vs. long-term memory capacities among the three groups of subjects studied here did not significantly affect subjects' performance in this initial-stage L_2 learning task.

The results with regard to the ninth grade Latin students did not confirm the expected superiority of this population subgroup with regard to their second language learning capacities. Although these students were better in over-all test-score performance at Session 2, the difference was not significant compared to the other J.H.S. students tested. For these twelve subjects, at least, formal instruction in Latin did not 'give them a leg up' in learning Hawaiian.

The final sub-population to be considered is the group of subjects from each age group who were present at Session 2 only (N = 20: 5 (Grade 4); 10 (Grades 7/8); 5 (Grade 11). Their performance is of interest since this group can tell us how subjects might perform <u>without</u> benefit of the 'naturalistic' exposure to Hawaiian offered to the L_2 learners at Session 1, but <u>with</u> formal, explicit linguistic rules in front of them to help

them perform the tasks- as close to a "MAL" experiment as one can get, and still use a "Natural" language as the target language.

Curiously, the "Session 2-only" seventh/eighth graders did not do as well on this Hawaiian task as the master population of J.H.S. students, while the "Session 2-only" eleventh graders' performance was almost on a par with that of the other 48 H.S. subjects who were there for both Sessions 1 and 2. (The fourth grade "Session 2-only" subjects were significantly poorer than their master group in test-score performance.) Although the sample size is too small to make any strong inferences about the benefits of 'naturalistic' vs. 'rule-based' instruction in a second language, there is a 'staircase-" effect or tendency among these twenty subjects: fourth graders poorest, J.H.S. students less poor, H.S. students better- with just the language rules alone. Thus, this study presents contradictory evidence "for" (as above) and "against" (pp.118-119) the age-dependent benefits of explicitly presented linguistic rules in L_2 language learning.

Summary and Concluding Remarks

This study began as an attempt to separate those factors in second language learning which are age-related from those which are not. It was hoped that since the experiment entailed the initial stages of second language learning, there would be greater

"consistency" and "homogeneity" by age in the subjects' responses: ". . . there may be considerable homogeneity in the individual's 'beginning game' (than in his/her). . . subsequent cognitive management" (Flavell, 1982, p.6).

Indeed, results did reveal such age-related 'consistencies" in some of the areas of second language learning addressed here. First, in terms of overall test-score performance across both test and post-test conditions, the two older groups (J.H.S. and H.S. students) were significantly better than the younger (fourth grade students) group; particularly, the seventh/ eighth graders tested.

Second, there were age-related 'regularities' in test-score performance by linguistic subset: older subjects evidencing a consistently higher proportion of correct syntactic responses on the multiple choice task; younger subjects evidencing a consistently lower proportion of semantic-multiple choice errors. This latter finding supports those theorists who suggest that syntactic development is more closely related to cognitive maturation than semantic development, both in first and second language acquisition (Bowerman, 1975, 1981; Heilenman, 1981; Tremaine, 1975).

Within these linguistic subsets, error analyses of subjects' responses also revealed significant 'homogeneities' within age groups; e.g., the higher proportion of "type-1" syntactic errors (imposition of S-V-O canonical sentence patterns with accompanying

subject/object reversals) and a higher proportion of omitted locatives ("type-4" errors) in the semantic items among GRADE 4 subjects tested gave support to the view that there are developmentally constrained "operating heuristics" in second language learning (McLaughlin, 1977; 1981)- a finding made stronger by the fact that the bilingual fourth graders were not significantly different from the monolingual fourth graders with respect to the preponderance of these two error types.

On the other hand, this study also revealed the presence of factors which "over-rode" the age-related 'consistencies' in L_2 performance just described. First- the influence of the first language (English) was evident in "interference" factors present in all age groups (e.g., the imposition of S-V-O word-order on the Hawaiian stative in the Syntactic-Anagrams task). Indeed, such transfer strategies were in evidence in the Syntactic-Multiple Choice subtest as well, where over 90% of the subjects' errors, across all age groups tested, could be accounted for by just two such L_1 ---> L_2 interference-based errors: a direct mapping of the English command form onto Hawaiian transitives, and the (S-V-O) canonical word order strategy described above.

Second, there were 'inconsistent' variations in subtest performance by level-of-task-difficulty: Syntactic-Anagrams proving to be "unexpectedly" easier for all subjects, regardless of age, and Semantic-Error Detection proving to be "expectedly" more

difficult for the fourth graders and "unexpectedly" more difficult for the eleventh graders tested.

Third, there was a "core" of L_1 -related proficiencies and school/ academic factors (Reading Class, Reading Level, + School (foreign) language, School Language Use-over-time), which consistently predicted performance on the Hawaiian language tests administered: across all age groups and across test/ post-test conditions. Indeed, the presence of a "school language" factor among only nine of the fourth graders tested was enough to account for one-fifth of the explained variance in second-week gain among even these young subjects. The 'special' nature of the J.H.S. subjects in terms of their unusually good performance on this Hawaiian task must also be recognized as a possible out-growth of their exceptionally high L_1 proficiencies, especially when we recall that their mean reading level in English was (grade-level) 11.1.

The strong influence of school-related factors in predicting students' success in this experiment must also be seen in the context of the Socioeconomic factors that were observed to affect performance, sample-wide, at test Session 1; namely whether or not the children lived in homes or apartments that were owned or rented by their families, and parental occupations. Although these two factors did not add significantly to the prediction of test-score results within age group, the direction of influence of these two factors across the whole subject sample

analyzed (i.e., better performance on the Hawaiian test more strongly correlated with higher parental occupational status and home-ownership) should be considered in conjunction with the "core" academic factors cited above. It is possible, for example, that despite all attempts by the experimenter to prevent such an occurrence, the experimental outcomes presented here have been influenced by the nature of the subject-base itself. The question arises- How much of what was found here can be attributed to (presumably) 'universal' strategies of L_2 learning in children vs. young adults, and how much can be attributed to a simple "local" effect- that a number of high-achieving, suburban school children, from their own homes, with parents who were working at high-status jobs, performed these tasks? A similar question has been raised (pp.106-107) with regard to the equally anomalous "underachieving" eleventh graders in accounting for the apparent "leveling-off" in performance they evidenced in comparison to the seventh/eighth graders tested. A resolution of this question awaits replication of the results of this study by other L_2 experimenters in other locales, with varying populations of second language learners. At the present time, for example, this author is preparing to adapt these materials to pre-literate (Kindergarten/first-grade) child populations as well as to administer this experiment, in its present form, to other groups of (older) L_2 learners; specifically, university-level and non-university level (working-class) adults.

This study has shown, above all, that there is indeed a multiplicity of factors (apart from subjects' age) impinging upon the successful or non-successful learning of aspects of a non-native language. If this is the case given the controlled L_2 experimental learning conditions described in the present study, how much more difficult the job of the researcher becomes when s(he) attempts to investigate the "Age-Effect" (or, any other age/ language related hypotheses of L_2 acquisition) under 'naturalistic' conditions which are further complicated by the presence of intra-subject changes in language-learning capacities and abilities over time? On a practical basis, therefore, the now familiar theoretical dichotomy between age-specific and non- age-specific factors in second language acquisition/ learning may be inherently inaccessible to empirical verification; particularly when school-age populations of L_2 learners are exposed to experimental treatment. The "Age-Effect," therefore, may have to be re-addressed, in some as-yet-undetermined form, as an essentially multi-variate issue: e.g., Age-and-L_1 abilities; Age-and-Socio-economic status, etc..

Such a clash between theory and practice is not unknown in our field; the artificial dichotomies which language scientists sometimes create for the sake of 'parsimony' often do not withstand close scrutiny in the real world. In this respect, I am reminded of Paul Kiparsky's reflections on the linguist's invention of a distinction between syntax and semantics: "Nor is the fact that

a generalization can be stated enough to show that it is real" (p.172). . . .

APPENDIX 1

Instructional Materials For the Hawaiian Language Learning Task

"Here is a list of Hawaiian words and pictures that will appear in the story you will read and hear in a few minutes."

FIRST- the people in the story:

MELE (the daughter's name and the heroine of our story)

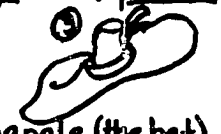
MAMA (mother)

MAKUA (father)

SECOND- some names of things and places that will appear in the story:

① Ka lole (the dress)

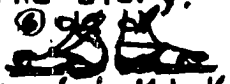
② Ka lole wawae (the pants)



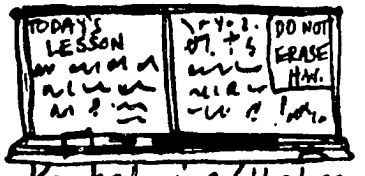
③ Ka papale (the hat)

④ Ka lei (the crown)

⑤ Ka pa'a kaama (the pair of boots)



⑥ Ka pa'a hakahaka (the pair of sandals)



⑦ Ka ha'awina (the lesson)

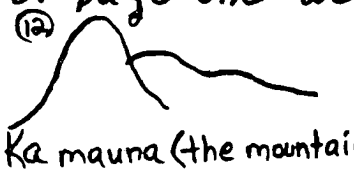
⑧ Ka puke (the book)

⑨ Ka home (the home- where mele lives)

⑩ Ka Kula (the school- mele's school)

P.1

"And on the other side of page one we have..."



"And, of course:"

(14) WaiKiKi (the name of a famous beach in Hawaii)

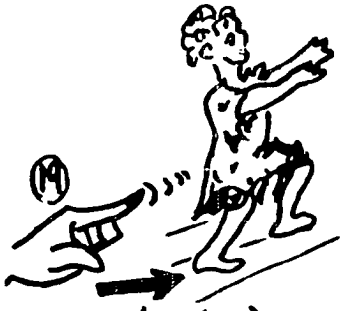
(15) Oahu (the name of a famous island in Hawaii and the island where Mele lives)

(16) Mauna Loa (the name of a famous volcano in Hawaii)

"Last- you need to know some action words that will also appear in the story."

Komo (put on)

hele (come)

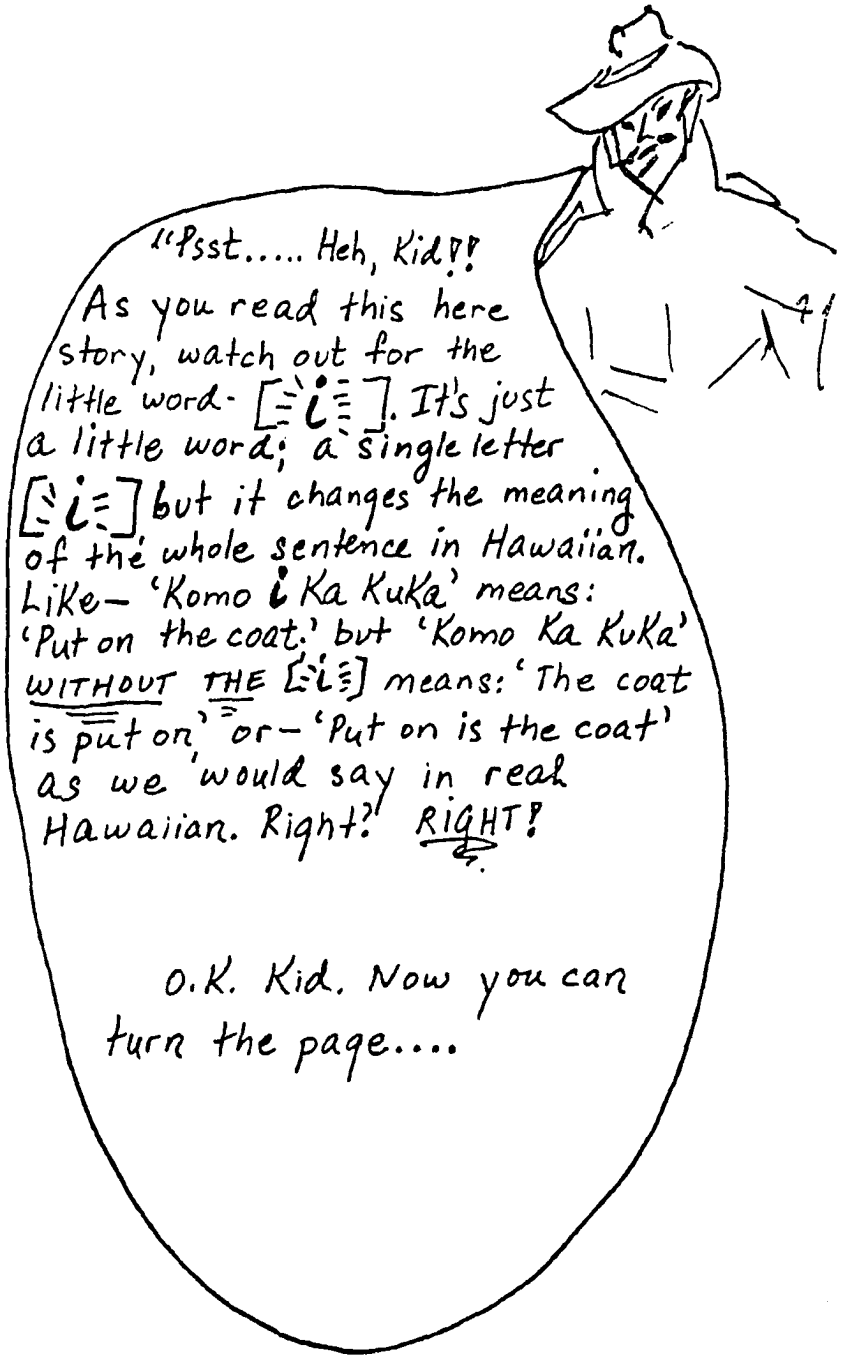


hele aKu (go)

KauKau (write)

heluhelu (read)

P.1



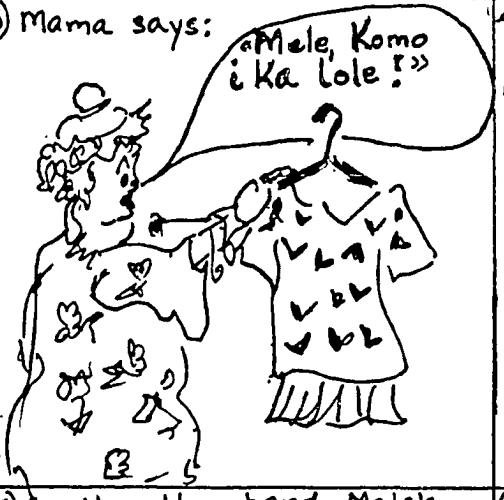
(I)

PART ONE - Mele's clothes

1) Mele's mother and father are always arguing about what Mele should wear to school.

2) Mama is very old-fashioned and she wants Mele to wear Hawaiian-style clothes.

3) Mama says: "Mele, Komo i Ka lole!"



4) Because Mele wants to please her mother she puts on the dress.

5) On the other hand, Mele's father wants her to be a modern girl and wear American style clothes.

6) So, father says:

P2

7) And, because Mele wants to please her father, too - she puts on the pants.

8) "OK, Makua," she says:

9) "Good," father says; "now the cowboy hat."

10) "Sure, My dear Makua," says Mele:

11) But Mama cries out:

12) So,....

FP3

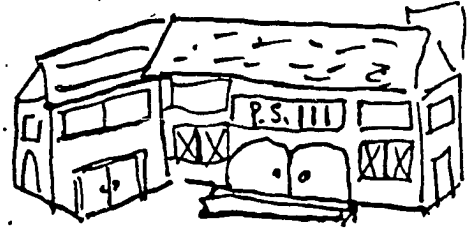
13) But wait! Mele forgot to put something on her feet. Father says:

14) And Mele replies—

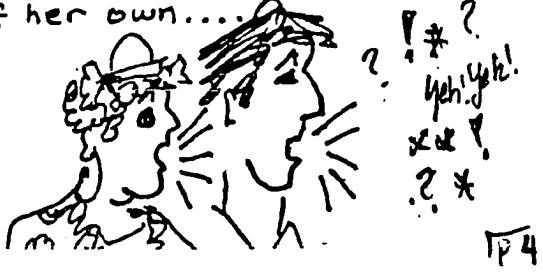
15) "Ay," says Mama....

16) You guessed it!

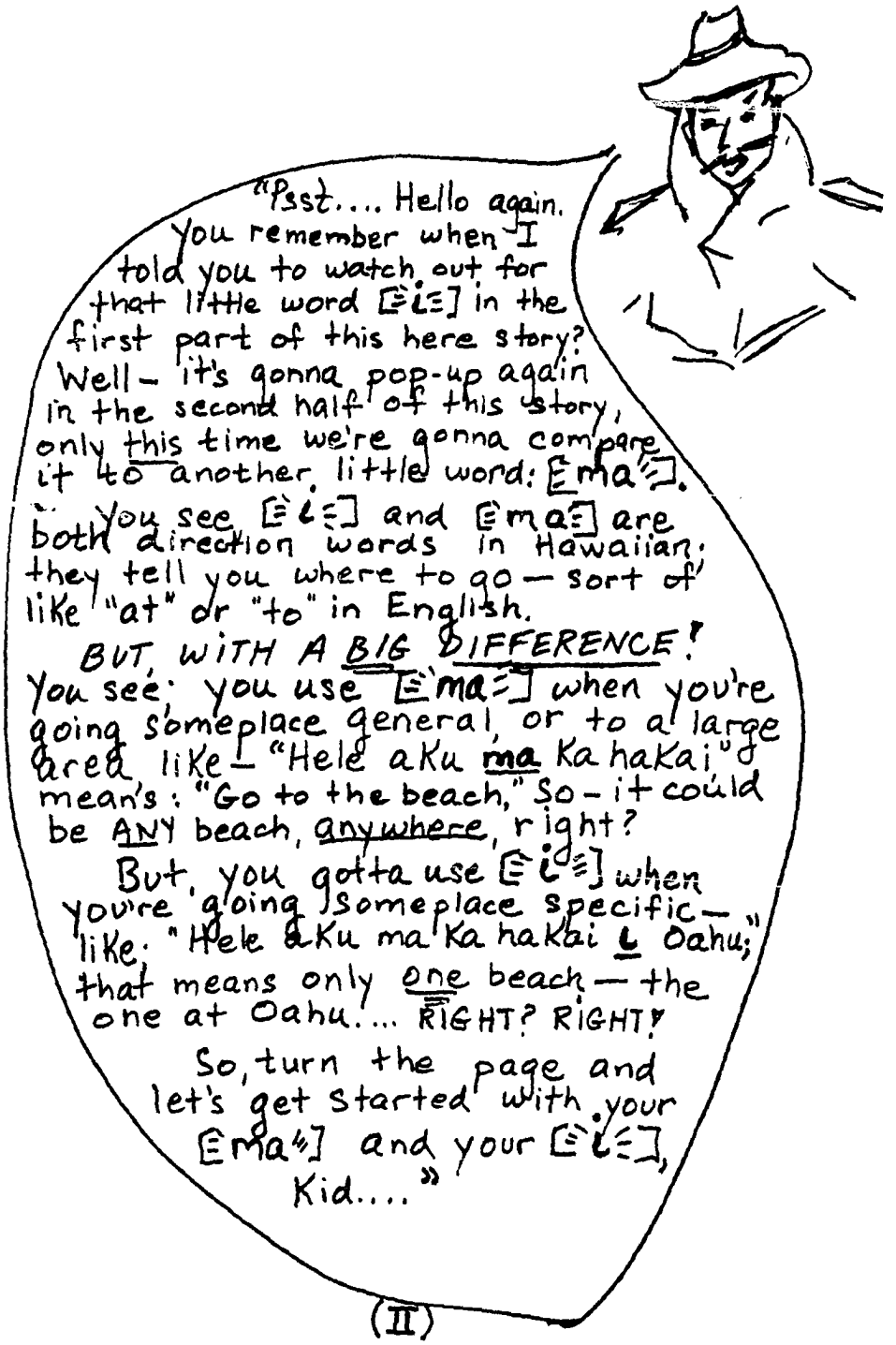
17) Now our heroine, Mele, is all dressed up, and ready to go to school!



18) Mele's mother and father are always giving Mele advice about how to behave in school, too. But — you'll soon see that Mele has some ideas of her own....



TP 4



25) Now that Mele has been suspended for trying to run away from school, she has a lot of time on her hands....

26) Her parents suggest that Mele visit some of the famous places in Hawaii but they're arguing about where she should go.

27) Mother insists—

28) But, when mele asks, "which mountain?" father adds:

29) "Oh no," mother exclaims...

30) "Silly woman," says father. "There's no mountain at WaiKiKi. . . ."

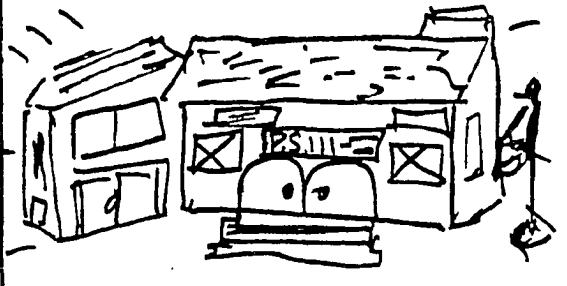
P.6

37) But Makua shouts, "Everybody knows Mauna Loa is a volcano."

38) And Mama shouts back—

39) So, Mele does go to the beach at WaiKiKi- just to get a rest from all the arguing....

40) While she's away, the school term is resumed and Mele receives a note that she may return to her class.



41) Mother and father decide not to argue with each other about Mele anymore....

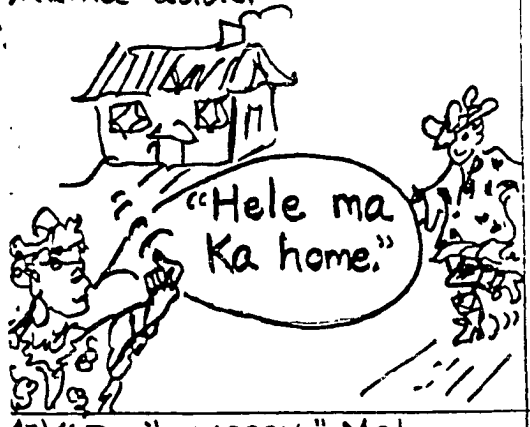
42) Mama and Makua tell Mele that everything is forgiven and that they miss her and want her to return.

TPE

43) Father says, "yes, Mele dear..."

44) "But wait a minute," asks Mele... "WHICH SCHOOL?"

45) "Don't worry, dear Mele," mama adds.

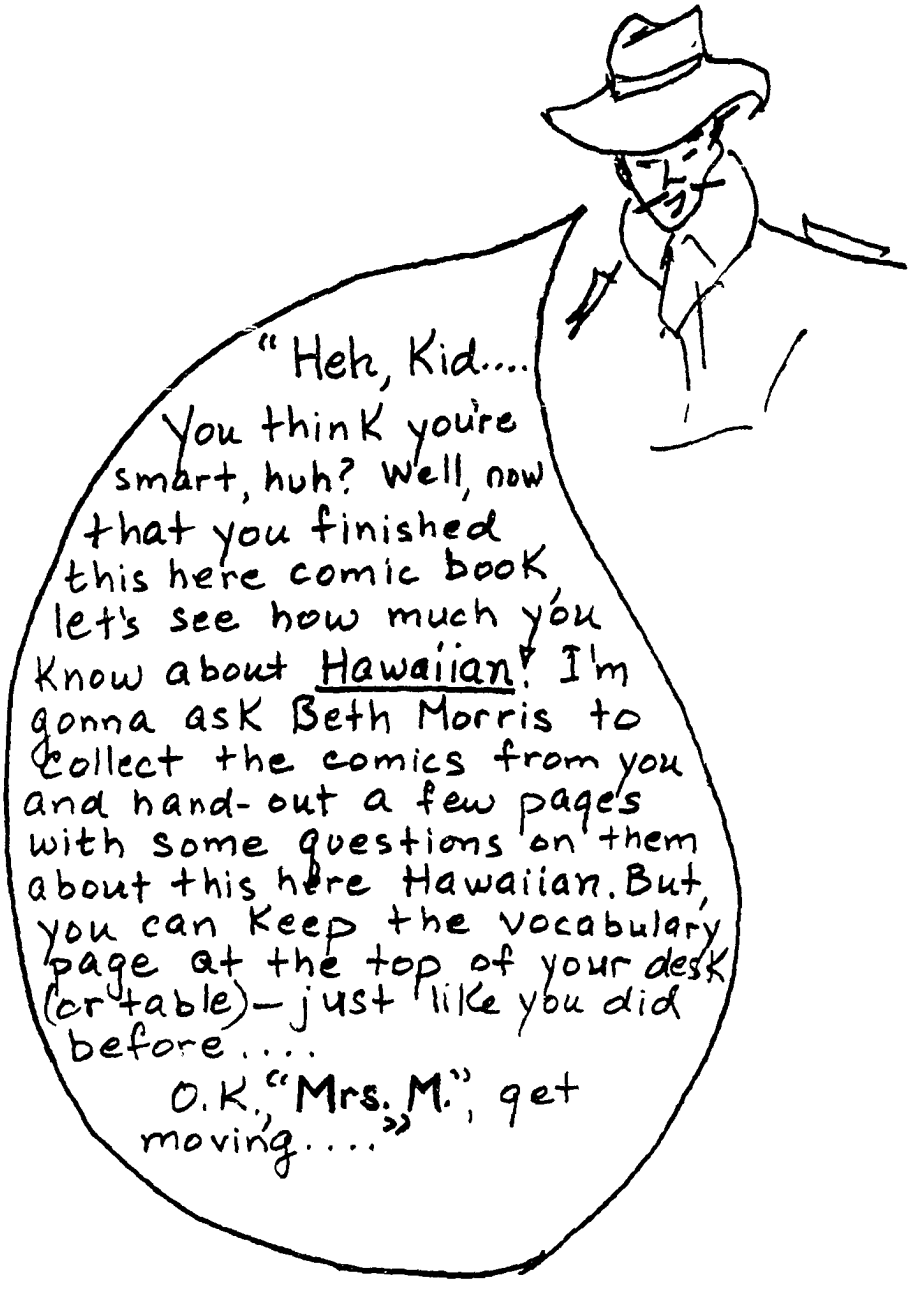


46) And Mele replies, "hmm..."

47) "Don't worry," Mele laughs... "You know me- always Kidding. I'm coming back to you right now!..."

48)

TPG



(II)

APPENDIX 2

Response Materials

RESPONSE SHEET- Page 1

Student Number: ROW/ SEAT _____/_____ DATE_____

School_____ Grade and class_____

Homeroom teacher_____ Reading or English class and teacher_____

_____

Part A- Multiple Choice

Directions: Which Hawaiian sentence on the right side of the page means the same as the English sentence on the left side of the page . Put a circle around the correct Hawaiian sentence; choose only one sentence in each group.

example: The dress is put on.

a. Ka lole i komo.
b. Komo i ka lole.
c. Komo ka lole.
d. Lole ka komo.

- - - - - - - -

1. Put on the pants.

a. Ka lole wawae i komo.
b. Komo i ka lole wawae.
c. Komo ka lole wawae.
d. Komo ka lole wawaes.

- - - - - - - - - - -

2. The book is read.

a. Ka puke heluhelu.
b. Heluhelu ka puke.
c. Heluhelu i ka puke.
d. Heluhelu puke.

- - - - - - - - - - -

3. Go to Mama.

a. Hele aku Mama.
b. Mama i hele aku.
c. Mama hele aku.
d. Hele aku i Mama.

- - - - - - - - - - -

4. Read the lesson.

a. Heluhelu i ka ha'awina.
b. Ka ha'awina i heluhelu.
c. Heluhelu ka ha'awina.
d. Ha'awina heluhelu.

- - - - - - - - - - -

RESPONSE SHEET - page 2

Here are some <u>new</u> Hawaiian words you will need to use in the next part of this exercise: (for numbers 5., 6., and 7.)

ka kukaweke- (the raincoat)

lawe- (take-off)

5. Put on the raincoat.
   a. Komo ka kukaweke.
   b. Komo i ka kukaweke.
   c. I komo ka kukaweke.
   d. Kukaweke i komo.

- - - - - - - - - - -

6. Take off the pair of sandals.
   a. Pa'a hakahaka i lawed.
   b. Lawe ka pa'a hakahaka.
   c. Lawe i ka pa'a hakahaka.
   d. Ka pa'a hakahaka lawe.

- - - - - - - - - - -

7. The raincoat is taken off.
   a. Lawe i ka kukaweke.
   b. Ka kukaweke i lawed.
   c. Kukaweke lawe i.
   d. Lawe ka kukaweke.

- - - - - - - - - - -

8. Go to the mountain at Mauna Loa.
   a. Hele aku ma ka mauna ma Mauna Loa.
   b. Hele aku ma ka mauna i Mauna Loa.
   c. Hele aku i ka mauna ma Mauna Loa.
   d. Hele aku ka mauna, Mauna Loa.

- - - - - - - - - - -

9. Come home to Oahu.
   a. Hele ma ka home i Oahu.
   b. Hele home i Oahu.
   c. Hele i ka home ma Oahu.
   d. Hele i ka home i Oahu.

- - - - - - - - - - -

10. Go home to Waikiki.
   a. Hele aku i ka home i Waikiki.
   b. Hele aku home ma Waikiki.
   c. Hele aku i ka home ma Waikiki.
   d. Hele aku ma ka home i Waikiki.

- - - - - - - - - - -

11. Come to the beach at the mountain.
   a. Hele ma ka hakai i ka mauna.
   b. Hele ma ka hakai ma ka mauna.
   c. Hele i ka hakai i ka mauna.
   d. Hele ka hakai, ka mauna.

- - - - -(2)- - - - -

RESPONSE SHEET- page 3

Here are some <u>new</u> Hawaiian words you will need to use in the next part of this exercise: (for numbers 12., 13., and 14.)

i$\bar{o}$ - (as far as)

$\bar{a}$ -(way up to)

12. Go way up to the beach at Waikiki.

a. Hele aku $\bar{a}$ ka hakai, Waikiki.
b. Hele aku i ka hakai $\bar{a}$ Waikiki.
c. Hele aku $\bar{a}$ ka hakai ma Waikiki.
d. Hele aku $\bar{a}$ ka hakai i Waikiki.

- - - - - - - - - - -

13. Come home as far as Oahu.

a. Hele home ma Oahu.
b. Hele ma ka home i$\bar{o}$ Oahu.
c. Hele i ka home i$\bar{o}$ Oahu.
d. Hele io ka home ma Oahu.

- - - - - - - - - - -

14. Go way up to the school as far as the mountain at Oahu.

a. Hele aku $\bar{a}$ ka kula i$\bar{o}$ ka mauna ma Oahu.
b. Hele aku $\bar{a}$ ka kula i$\bar{o}$ ka mauna i Oahu.
c. Hele aku $\bar{a}$ ka mauna i$\bar{o}$ ka kula i Oahu.
d. Hele aku $\bar{a}$ ka kula i$\bar{o}$ ka mauna, Oahu.

RESPONSE SHEET- page 4

Part B- Scrambled Sentences

Directions: Here are some words from the story you just heard and read. They are not written in sentences. Please re-arrange the words to make a correct Hawaiian sentence that matches the English sentence on the left side of the page.

Ka; i; lole; komo

example: Put on the dress. Komo i Ka lole.

- - - - - - - - - - - -

papale; ka; i; komo

1. Put on the hat. _____.

- - - - - - - - - - - -

komo; kaam'a; pa'a; ka

2. The pair of boots is (are) put on. _____.

- - - - - - - - - - -

ka; i; kaukau; puke

3. Write the book. _____.

- - - - - - - - - - -

makua; aku; hele

4. Father is gone. _____.

- - - - - - - - - - - -

Here are some new Hawaiian words you will need for the next part of this exercise. (For numbers 5., 6., and 7.)

ka kukaweke - (the raincoat)

lawe- (take off)

lawe; lei; ka

5. The crown is taken off. _____.

- - - - - - - - - - -

i; komo; kukaweke; ka

6. Put on the raincoat. _____.

- - - - - - - - - - -

lawe; i; ka; kukaweke

7. Take off the raincoat. _____.

- - - - - - - - - - -

RESPONSE SHEET- page 5

Part C- Error Detection

Directions: One of the sentences on the left side of the page is wrong; it doesn't make sense in Hawaiian. Put a circle around the one sentence in each group that is wrong. (If you have some extra time, you may want to write the sentence again correctly in the blank space next to each group of sentences.)

example: A. Komo i ka lole.
* B. Komo i ka puke.
C. Komo i ka pa'a hakahaka.
D. Komo i ka pa'a kaam'a.

Komo i Ka papale.

* ("Komo i ka puke" is wrong because you can't put on a book! So, the sentence was re-written as "Komo i ka papale," which is correct.)

- - - - - - - - - - -

1. a. Hele aku i ka hakai.
   b. Hele aku ma ka pele.
   c. Hele aku ma ka mauna.
   d. Hele aku ma ka kula.

   _____.

- - - - - - - - - - -

2. a. Komo i ka lole wawae.
   b. Komo i ka papale.
   c. Komo i ka lei.
   d. Komo i ka ha'awina.

   _____.

- - - - - - - - - - -

3. a. Heluhelu ma ka hakai.
   b. Heluhelu ma ka home.
   c. Heluhelu ma ka kula.
   d. Heluhelu ma ka puke.

   _____.

- - - - - - - - - - -

4. a. Kaukau ka ha'awina ma ka hakai i Waikiki.
   b. Kaukau ka ha'awina ma ka kula i Waikiki.
   c. Kaukau ka ha'awina i ka home i Waikiki.
   d. Kaukau ka ha'awina ma ka mauna i Waikiki.

   _____

   _____.

(5)

APPENDIX 3

Coding Of Test Responses

and

Description of Error Types

APPENDIX 3

CODING OF TEST ITEMS BY ERROR-TYPE

Item #	Response Type	Linguistic Type	Set	Error Type/Code
	MC = Multiple Choice	SYN = Syntactic	I = Rote	For ALL items: a, b, c, d
	ANA = Anagrams	SEM = Semantic	II = Re-Arranged	06 = No Response
	ED = Error Detection		III = Rule	08 = Correct
1	MC	SYN	SET I	a=01 ; SVO order *imposed on a* transitive sentence with SUBJ./OBJ. reversal
				b=03
				c=03 ; Ø "i;" wrong HWN. rule; stative used.
				d=04 ; Direct translation from ENG., w/ Plural /s/ marker.
2	MC	SYN	SET I	a=01 ; SVO order imposed on stative sentence, with SUBJ./OBJ. reversal.
				b=08
				c=03 ; Wrong HWN, rule; use of transitive sentence w/D.O. marker, "i."
				d=05; Ø noun marker, "ka."

3	MC	SYN	SET II	a=03; Ø "i;" wrong HWN. rule; stative used. b=01; SVO order imposed on transitive sentence with SUBJ./OBJ. reversal. c=02; same as b) above + Ø of D.O. marker "i." d=08
4	MC	SYN	SET II	a=08 b=01; SVO order imposed on transitive sentence w/ SUBJ./OBJ. reversal c=03; Ø "i;" Wrong HWN. rule; stative used. d=02; SVO order imposed on transitive sentence; Ø of noun marker "ka" and D.O. marker "i;" SUBJ.OBJ. reversal.
5	MC	SYN	SET III	a=03; Ø "i;" wrong HWN. rule; stative used. b=08 c=04; Direct translation from ENG.; "I put on the raincoat." d=05; Ø noun marker "ka;" SVO order imposed on transitive sentence; SUBJ./OBJ. reversal

6	MC	SYN	SET III	a=04; Ø noun marker "ka;". Direct translation from ENG.w/ PT /ed/ marker; SUBJ./OBJ. reversal
				b=03; Ø "i;" wrong HWN. rule; stative used.
				c=08
				d=02; SVO order imposed on transitive sentence; Ø D.O. marker; "i;" SUBJ/OBJ. reversal
7	MC	SYN	SET III	a=03; wrong rule; transitive HWN. sentence used.
				b=04; Direct translation from ENG. w/ PT marker /ed/ + SUBJ./OBJ. reversal
				c=05; SVO order imposed on stative; Ø noun marker "ka."
				d=08
8	MC	SEM	SET I	a=01; Wrong use of "ma."
				b=08
				c=03; Reversal of "i" & "ma" meanings.
				d=05; Ø locatives.
9	MC	SEM	SET I	a=08
				b=04; Direct translation from ENG.
				c=03; Reversal of "i" and "ma" meanings.
				d=02; Wrong use of "i."

10	MC	SEM	SET II	a=02; Wrong use of "i." b=04; Direct translation from ENG. c=03; Reversal of "i" and "ma" meanings. d=08
11	MC	SEM	SET II	a=02; Wrong single use of "i." b=08 c=02; Wrong double use of "i." d=05; Ø of locatives.
12	MC	SEM	SET III	a=05; Ø of locatives. b=03; Reveral of "i" and "ma" meanings. c=01; Wrong use of "ma." d=08
13	MC	SEM	SET III	a=05; Ø of locatives. b=08 c=02; Wrong use of "i." d=01; Wrong use of "ma;" reversal of locatives.
14	MC	SEM	SET III	a=01; Wrong use of "ma." b=08 c=03; Reversal of locatives a and io. d=05; Ø of locatives.
15; 16	ANA	SYN	SET I	
17, 18	ANA	SYN	SET II	
19; 20	ANA	SYN	SET III	

CORRECT ANSWERS:

1. Komo i ka papale.
2. Komo ka pa'a kaam'a.
3. Kaukau i ka puke.
4. Hele aku Makua.
5. Lawe ka lei.
6. Komo i ka kukaweke.
7. Lawe i ka kukaweke.

22; 23	ED	SEM	SET I
24; 25	ED	SEM	SET II
26; 27	ED	SEM	SET III

CORRECT ANSWERS:		ERROR CODE
1. a; all other choices represent an inability to detect the wrong use of "i," violation of the rule for "ma."	=	01
2. d; all other choices represent an inability to detect semantic anomaly in a content word.	=	05
3. d; all other choices represent either an inability to detect a semantic anomaly in a content word or an inability to detect the wrong use of "ma."	=	05/02
4. c; all other choices represent an inability to detect the wrong use of "i;" violation of the rule for "ma."	=	01
5. b; all other choices represent an inability to detect the wrong use of "i;" violation of the rule for "ma."	=	01
6. c; all other choices represent an inability to detect the wrong use of "ma;" violation of the rule for "i."	=	02
7. c; all other choices represent an inability to detect semantic anomaly in a content word.	=	05

APPENDIX 4

Vocabulary Review Test

at Post-test/ Session 2

School_____ Student Number _____ ROW/ SEAT _____

Reading/English
Class and Teacher_____ Date_____
Grade_____

VOCABULARY REVIEW

DIRECTIONS: Match the Hawaiian words on the LEFT side of the page to the English words on the RIGHT side of the page. Write the letter in front of the correct English word NEXT TO the Hawaiian word in the column marked- "MATCHING LETTER."

		MATCHING LETTER	
example:	26. Waikiki	b.	a. a famous volcano in Hawaii
	27. Mauna Loa	a.	b. a famous beach in Hawaii

HAWAIIAN WORDS	MATCHING LETTER	ENGLISH WORDS
1. ka puke		a. come
2. ka pa'a hakahaka		b. the lesson
3. ka mauna		c. write
4. hele aku		d. the volcano
5. ka papale		e. the crown
6. mama		f. father
7. ka hakai		g. the home
8. ka pa'a kaam'a		h. the hat
9. kaukau		i. go
10. ka lole		j. the pants
11. hele		k. the book
12. ka ha'awina		l. the pair of sandals
13. heluhelu		m. the school
14. ka pele		n. the mountain
15. makua		o. the pair of boots
16. ka kula		p. the beach
17. ka lei		q. mother
18. ka home		r. read
19. komo		s. put on
20. ka lole wawae		t. the dress

APPENDIX 5

Student Questionnaire

QUESTIONNAIRE

Date: _____

-1-

1) Student Number: ROW _____ SEAT _____

2) Sex: M F

3) Birthdate: month/day /year ____/____/____

4) School: _____ 5) Homeroom teacher: _____

6) Grade: _____ 7) Cluster or Section: _____

8) Reading or English class: number and section: _____

9) RL (Do NOT write in this box.)

10) Reading or English teacher: _____

11) Do you live in an apartment house? (If your answer to this question is "NO," skip to question 13) YES NO

12) a) Is your apartment in a federal, state, or city-owned development? YES NO

b) Is your apartment rented from a private person or agency? YES NO

c) Is your apartment in a cooperative or condominium owned by your family? YES NO

13) Do you live in a private house? (If your answer to this question is "NO," skip to question 15) YES NO

14) a) Is the private house owned by your family? YES NO

b) Is the private house rented from someone else? YES NO

QUESTIONNAIRE (cont'd)

-2-

15) Do you live at home with both of your parents? YES NO

16) If your answer to question 15) was, "NO-"
Which parent do you live with most of the time?
(Check one)

a) mother YES NO

b) father YES NO

c) other relative or guardian YES NO

17) What is your mother's occupation or job ? (check one)

a) unemployed or homemaker_____

b) office worker_____

c) factory worker_____

d) health-care worker (nurse, hospital aide, dental technician, etc.)_____

e) business person (salesperson, manager, executive, owner of a business, etc.)_____

f) professional (doctor, lawyer, teacher, accountant, engineer, etc.)_____

g) other (please write in):
_____

18) What is your father's occupation or job? (check one)

a) unemployed or homemaker_____

b) office worker_____

c) factory worker_____

d) health-care worker (nurse, hospital aide, dental technician, etc.)_____

e) business person (salesperson, manager, executive, owner of a business, etc.)_____

f) professional (doctor, lawyer, teacher, accountant, engineer, etc.)_____

g) other (please write in):
_____

19) Do you have any brothers? YES NO

a) How many are older than you? _____

b) How many are younger than you? _____

QUESTIONNAIRE (cont'd)

20) Do you have any sisters? YES NO

a) How many are older than you? _____

b) How many are younger than you? _____

21) Do you speak any other languages at home besides English? YES NO
(If your answer to this question is "NO," skip to question 25)

22) Write-in the name of the other language or languages that you speak at home: (Chinese, French, Spanish, etc.)

_____

23) How much of the time do you use this other language at home?- (check one)

a) very little___ b) about half the time___ c) almost all the time___

24) How long have you been speaking English? (check one)

a) a few weeks___ b) several months___ c) several years___

25) Are you learning any foreign languages in school? YES NO

26) Write-in the name of the foreign language or languages you are learning in school: (Chinese, French, Spanish, Hebrew, etc.)

_____

27) How long have you been studying this language in school? (check one)

a) a few weeks___ b) several months___ c) several years___

28) Do you enjoy learning foreign languages? YES NO

29) Would you like to travel or live in a foreign country someday? YES NO

30) How much would you like to continue learning about Hawaiian? (check one)

a) not at all___ b) a little more than I have already learned___ c) alot more than I have already learned ___

APPENDIX 6

Protocol for Instructional, Test and Post-Test Sessions

PROTOCOL for the Hawaiian language learning task

SESSION I (50 minutes for 7, 8, 9 & 11th grades;
55 minutes for the 4th grade)

Materials needed: Audio cassette lesson
Tape Recorder
Comic books
Response sheets
Pencils
Stickers and pictures

1. Play 1-3 minutes of Hawaiian music on the tape recording while comic books are being distributed. In live voice, ask subjects just to "make note" of their ROW and SEAT numbers as indicated on the blackboard. Have students place all books, pencils and school materials out of the way, and remind them, in live voice:

PLEASE DO NOT OPEN THE BOOKLETS
UNTIL THE DIRECTIONS ON THE TAPE
RECORDING TELL YOU TO DO SO, AND
DO NOT REMOVE ANY OF THE PAPER
CLIPS FROM THE BOOKLETS.

2. INTRODUCTION (on the audio-cassette only)

"Aloha! Aloha a ʻina! Today we're going to learn something about the language of our fiftieth state, Hawaii--but before I introduce you to Hawaiian, there are some important words you need to know. Each of you has a booklet in front of you on your table or desk, so please open your booklets to page 1, unfold the page carefully, and let's begin.

By the way- the picture and sticker from Hawaii that you see on the cover of your booklet belong to you. At the end of this session, you make take them off the cover and keep them as a momento of our meeting today. Now, turn to page 1."

3. THE VOCABULARY PAGE (on audio-cassette and in the booklet as presented, the vocabulary items are presented to the subjects).

Upon completion of the vocabulary items, the experimenter says (on audio cassette only):

"You may have noticed that your vocabulary page has a dotted line along the inside of the paper. Would you please remove the vocabulary page from your booklets now, and do so carefully so that the paper doesn't tear.* (Demonstrate to the students while the tape is explaining. . . .)

Now place the vocabulary page at the top of your desk or table so you can see it throughout the entire story. This way, you won't have to worry about forgeting these important words during our session today.

So, let's turn to page 2 for your first meeting with Hawaiian."

4. THE SCRIPT of the comic books beings on the audio-cassette tape recording following an additional 30 seconds of Hawaiian music to allow for late-comers.

5. AT THE END OF THE TAPE RECORDING, collect comic books, leave vocabulary pages on the students' desks, hand-out RESPONSE SHEETS and PENCILS. While moving around the classroom say (in live voice):

YOU CAN REMOVE THE PICTURES AND STICKERS FROM YOUR BOOKLETS NOW, BUT PLEASE BE CAREFUL NOT TO REMOVE THE PAPER CLIPS WHEN YOU DO SO.

NOW THAT YOU ALL HAVE YOUR RESPONSE SHEETS IN FRONT OF YOU, CHECK TO SEE THAT THERE ARE 6 PAGES THERE, AND FILL-OUT THE TOP PART OF YOUR RESPONSE SHEETS FIRST, INCLUDING YOUR ROW AND SEAT NUMBERS.

LET'S REVIEW THE DIRECTIONS ON EACH PAGE. FIRST, PART I, PAGE 1.

6. READ ALL DIRECTIONS for PARTS I, II, AND III in live voice. At the end of the directions for PART III, say, in live voice:

ARE THERE ANY QUESTIONS ABOUT ANY OF THESE DIRECTIONS OR EXAMPLES ON YOUR RESPONSE SHEETS? DO YOU ALL UNDERSTAND WHAT TO DO?

7. PAUSE for questions, if needed.

8. AFTER QUESTIONS, say the following in live voice:

> WORK AS QUICKLY AS POSSIBLE TO COMPLETE THE QUESTIONS ON YOUR RESPONSE SHEETS. PLEASE USE THE PENCILS HANDED OUT TO YOU AND ERASE ALL ERRORS CAREFULLY. DON'T WORRY IF YOU DON'T FINISH SOME OF THE QUESTIONS. REMEMBER, THIS IS NOT A REAL TEST LIKE THE KIND YOU HAVE DURING THE REGULAR SCHOOL DAY, SO TAKE A GOOD GUESS IF YOU ARE NOT SURE OF THE ANSWER. YOU MAY BEGIN NOW.

9. ALLOW 25 MINUTES for the 7, 8, 9, and 11th grade subjects to complete the test; 30 MINUTES for the fourth grade subjects.

10. At the end of the test, COLLECT RESPONSE SHEETS, VOCABULARY PAGES and PENCILS.

11. CONCLUSION: Say, in live voice:

> THANK YOU ALL FOR PARTICIPATING TODAY, AND DON'T FORGET TO TAKE YOUR PICTURES AND STICKERS WITH YOU. SEE YOU NEXT WEEK FOR A VERY SPECIAL REWARD AT THE END OF OUR NEXT SESSION.

SESSION II (50 minutes for the 7, 8, 9 & 11th grades;
55 minutes for the 4th grade)

Materials needed:
- Vocabulary pages (removed from booklets)
- The two "rule-statement" pages
- Tape Recorder
- Vocabulary Tests
- Response Sheets
- Questionnaires
- Pencils
- Baskin-Robbins gift certificates

1. Play 1-3 minutes of Hawaiian music as subjects are seated.

2. HAND OUT - VOCABULARY TESTS AND PENCILS, and say the following in live voice:

ALOHA, AGAIN! BEFORE WE BEGIN OUR SESSION TODAY, IT WOULD BE FUN TO KNOW HOW MUCH OF THE HAWAIIAN VOCABULARY YOU CAN REMEMBER FROM OUR FIRST MEETING LAST WEEK. SO, LET'S LOOK AT THIS VOCABULARY REVIEW TOGETHER AND READ THE DIRECTIONS AND EXAMPLES. DON'T FORGET TO FILL OUT THE TOP PART OF THE PAGE INCLUDING YOUR ROW AND SEAT NUMBERS AS THEY APPEAR ON THE BLACKBOARD.

3. For those students who were not present for Session 1, ask them to indicate same by writing "2 only" on the top of the page.

4. After reading aloud all directions and examples on the VOCABULARY REVIEW TEST, ask the following, in live voice:

ARE THERE ANY QUESTIONS ABOUT HOW TO DO THIS VOCABULARY REVIEW?

5. Allow for questions, if needed. After questions, say the following, in live voice:

YOU MAY BEGIN THE VOCABULARY REVIEW NOW.

6. ALLOW 7 MINUTES for the Vocabulary Review Test. At the end of test say the following, in live voice:

THE VOCABULARY REVIEW IS NOW OVER. I AM GOING TO COLLECT IT FROM YOU AND HAND BACK A FEW PAGES FROM THE HAWAIIAN STORY YOU READ AND HEARD LAST WEEK.

7. COLLECT the Vocabulary Review Tests; HAND-OUT the VOCABULARY PAGE, RULE STATEMENTS I & II, and the RESPONSE SHEETS, and say the following while moving around the room (in live voice):

YOU MAY COMPLETE THE REST OF YOUR RESPONSE SHEETS WITH THESE PAGES AT THE TOP OF YOUR DESK OR TABLE TO HELP YOU, AND JUST AS WE DID IN OUR FIRST SESSION TOGETHER, LET'S GO OVER THE DIRECTIONS AND EXAMPLES TOGETHER.

BEFORE WE DO, PLEASE PUT YOUR ROW AND SEAT NUMBERS ON THE TOP OF PAGE 1, AND BE SURE THERE ARE 6 PAGES IN YOUR ANSWER SHEETS.

8. FOLLOW THE PROTOCOL for SESSION I - Items 6-9.

9. At the end of the POST-TEST, collect RESPONSE SHEETS, VOCABULARY PAGES and RULE-STATEMENT PAGES.

10. Hand out the QUESTIONNAIRE, and say the following, in live voice:

> BEFORE WE FINISH UP TODAY, WOULD YOU PLEASE TAKE A LOOK AT THE QUESTIONNAIRE I'VE JUST HANDED OUT TO YOU. THE INFORMATION ASKED FOR ON THIS QUESTIONNAIRE WILL HELP US FIND OUT WHAT KINDS OF CHILDREN AND YOUNG ADULTS LEARN LANGUAGES BEST. IT WOULD BE MOST HELPFUL IF YOU WOULD ANSWER ALL THE QUESTIONS, BUT IF THERE ARE SOME QUESTIONS YOU DON'T WANT TO ANSWER, FEEL FREE TO LEAVE THEM BLANK. REMEMBER, THERE ARE NO NAMES ON THESE PAPERS, SO NO ONE WILL KNOW "WHO" WROTE "WHAT" ONCE YOU LEAVE THIS ROOM TODAY, SO DON'T BE AFRAID TO BE AS TRUTHFUL AS YOU WANT IN YOUR ANSWERS. PLEASE DO NOT MARK ANYTHING IN ITEM #6 ON THE QUESTIONNAIRE-LEAVE IT BLANK. PUT YOUR ROW AND SEAT NUMBER AT THE TOP OF THE PAGE, AND IF YOU HAVE ANY QUESTIONS OR PROBLEMS UNDERSTANDING ANY PART OF THIS QUESTIONNAIRE, RAISE YOU HAND AND I, OR YOUR TEACHER, WILL COME TO YOUR SEAT TO HELP YOU OUT. YOU CAN BEGIN NOW.

11. Allow (approx.) 10-15 MINUTES to complete the Questionnaire. Collect pencils and Questionnaires.

12. CONCLUSION: Greet subjects with a final "Aloha" and "Thank you;" hand out Baskin-Robbins gift certificates.

APPENDIX 7

Distribution of Multiple-Choice Responses by Three Age Groups on Seven Syntactic Items[1]

[1]Alphabetical characters beneath the arrows indicate letter codings of the choices.

CCLNT / CCL PCT		FOURTH GRADERS 1.	EIGHTH GRADERS 2.	ELEVENTH GRADERS 3.
①	1.A	7	1	2
SVC		16.4	1.4	4.2
CMIT LITTLE I	3.C	43	22	19
		61.2	30.1	39.6
CIRECT TRANSLATE	4.D	3	0	0
	B	4.5	0.0	0.0
CORRECT RESPONSE	8.B	15	50	27
		22.4	68.5	56.3
NO RESPONSE	9.	1	0	0
		1.5	0.0	0.0
②	1.A	45	36	20
SVC		67.2	49.4	41.7
CMIT LITTLE I	3.C	8	6	5
		11.9	8.2	10.4
CMIT KA	5.D	3	0	2
	B	4.5	0.0	4.2
CORRECT RESPONSE	8.B	10	32	21
		14.9	43.8	43.8
NO RESPONSE	9.	1	1	0
		1.5	1.4	0.0
③	1.B	6	4	0
SVC		9.0	5.5	0.0
CMIT DIRECT OBJ.	2.C	2	0	0
		3.0	0.0	0.0
CMIT LITTLE I	3.A	29	27	23
		43.3	37.0	47.9
CORRECT RESPONSE	8.D	29	42	25
		43.3	57.5	52.1
NO RESPONSE	9.	1	0	0
		1.5	0.0	0.0
④	1.B	5	1	1
SVC		7.5	1.4	2.1
CMIT DIRECT OBJ.	2.D	5	0	2
		7.5	0.0	4.2
CMIT LITTLE I	3.C	39	31	30
		58.2	42.5	62.5
CORRECT RESPONSE	8.A	18	41	13
		26.9	56.2	27.1
COLUMN TOTAL		67	73	48
		35.6	38.8	25.5

CCLNT / CCL PCT		FOURTH GRADERS 1.	EIGHTH GRADERS 2.	ELEVENTH GRADERS 3.
⑤	1.A	36	26	19
CMIT LITTLE I	3.C	53.7	35.6	39.6
CIRECT TRANSLATE	4.D	2	0	2
	B	3.0	0.0	4.2
CMIT KA	5.D	1	3	2
	B	1.5	4.1	4.2
CORRECT RESPONSE	8.B	22	44	25
		32.8	60.3	52.1
NO RESPONSE	9.	6	0	0
		9.0	0.0	0.0
⑥	2.D	8	3	1
CMIT DIRECT OBJ.		11.9	4.1	2.1
CMIT LITTLE I	3.B	33	27	23
		49.3	37.0	47.9
CIRECT TRANSLATE	4.A	3	1	3
	C	4.5	1.4	6.3
CORRECT RESPONSE	8.C	15	42	21
		22.4	57.5	43.8
NO RESPONSE	9.	8	0	0
		11.9	0.0	0.0
⑦	3.A	8	8	5
CMIT LITTLE I		11.9	11.0	10.4
CIRECT TRANSLATE	4.B	35	25	19
		52.2	34.2	39.6
CMIT KA	5.C	5	3	4
	D	7.5	4.1	8.3
CORRECT RESPONSE	8.D	11	37	20
		16.4	50.7	41.7
NO RESPONSE	9.	8	0	0
		11.9	0.0	0.0
COLUMN TOTAL		67	73	48
		35.6	38.8	25.5

APPENDIX 8

Distribution of Multiple-Choice Responses by Three Age Groups on Seven Semantic Items[1]

[1] Alphabetical characters beneath the arrows indicate letter codings of the choices.

COUNT / CEL PCT	FOURTH GRADERS	EIGHTH GRADERS	ELEVENTH GRADERS
⑧	1.	2.	3.
1. A WRONG USE OF MA	17 25.4	8 11.0	6 12.5
3. C REVERSE LOCATIVE	13 19.4	30 41.1	15 31.3
5. D OMIT LOCATIVES	20 29.9	7 9.6	7 14.6
8. B CORRECT RESPONSE	10 14.9	28 38.4	20 41.7
9. NO RESPONSE	7 10.4	0 0.0	0 0.0
⑨			
2. D WRONG USE OF I	11 16.4	10 13.7	8 16.7
3. C REVERSE LOCATIVE	14 20.9	16 21.9	14 29.2
4. B DIRECT TRANSLATE	28 41.8	20 27.4	13 27.1
8. A CORRECT RESPONSE	7 10.4	26 35.6	12 25.0
9. NO RESPONSE	7 10.4	1 1.4	1 2.1
⑩			
2. A WRONG USE OF I	18 26.9	9 12.3	4 8.3
3. C REVERSE LOCATIVE	9 13.4	20 27.4	16 33.3
4. B DIRECT TRANSLATE	26 38.8	17 23.3	14 29.2
8. D CORRECT RESPONSE	5 7.5	27 37.0	14 29.2
9. NO RESPONSE	9 13.4	0 0.0	0 0.0
⑪			
2. A WRONG USE OF I	32 47.8	33 45.2	25 52.1
5. D OMIT LOCATIVES	7 10.4	8 11.0	4 8.3
8. B CORRECT RESPONSE	18 26.9	32 43.8	19 39.6
9. NO RESPONSE	10 14.9	0 0.0	0 0.0
COLUMN TOTAL	67 35.6	73 38.8	48 25.5

COUNT / CEL PCT	FOURTH GRADERS	EIGHTH GRADERS	ELEVENTH GRADERS
⑫	1.	2.	3.
1. C WRONG USE OF MA	15 22.4	30 41.1	22 45.8
3. B REVERSE LOCATIVE	7 10.4	0 0.0	3 6.3
5. A OMIT LOCATIVES	18 26.9	4 5.5	1 2.1
8. D CORRECT RESPONSE	15 22.4	39 53.4	22 45.8
9. NO RESPONSE	12 17.9	0 0.0	0 0.0
⑬			
1. D WRONG USE OF MA	4 6.0	5 6.8	6 12.5
2. C WRONG USE OF I	20 29.9	34 46.6	15 31.3
5. A OMIT LOCATIVES	10 14.9	0 0.0	3 6.3
8. B CORRECT RESPONSE	19 28.4	34 46.6	24 50.0
9. NO RESPONSE	14 20.9	0 0.0	0 0.0
⑭			
1. A WRONG USE OF MA	15 22.4	33 45.2	14 29.2
3. C REVERSE LOCATIVE	16 23.9	5 6.8	7 14.6
5. D OMIT LOCATIVES	9 13.4	2 2.7	4 8.3
8. B CORRECT RESPONSE	13 19.4	32 43.8	21 43.8
9. NO RESPONSE	14 20.9	1 1.4	2 4.2
COLUMN TOTAL	67 35.6	73 38.8	48 25.5

REFERENCE NOTES

[1]Jones, James P. Director of Pupil Services, White Plains Public Schools. Unpublished School Census Report of October, 1982. Personal communication, December 14, 1982.

[2]Gilligan, Susanne K. Coordinator of English to Speakers of Other Languages Program, White Plains Public Schools. Personal communication, December 13, 1982.

[3]Gray, La Ruth. Deputy Superintendent, New Rochelle Public Schools. Personal communication, December 14, 1982.

[4]Stewart, William. Linguistics Program, the Graduate School and Center of the City University of New York. Personal communication, September 28, 1982.

[5]Hawkins, E. Department of Indo-Pacific Languages, University of Hawaii at Manoa. Personal communication, March 15, 1982.

[6]Stewart, William. Op.cit., note 4.

REFERENCES

Albert, M. and Obler, L. The Bilingual Brain: Neuropsychological and Neurolinguistic Aspects of Bilingualism. New York: Academic Press, 1978.

Anderson, J. Order of difficulty in adult second language acquisition. In W.C. Ritchie (Ed.) , Second Language Acquisition Research: Issues and Implications. New York: Academic Press, 1978.

Anderson, R. An implicational model for second language research. Language Learning, 1978, 28 (2), 221-282.

Asher, J. J. and Garcia, R. The optimal age to learn a foreign language. The Modern Language Journal, 1969, 8, 334-341.

Ausubel, D. Adults vs. children in second language learning: Psychological considerations. The Modern Language Journal, 1964, 48, 420-424.

Bailey, N., Madden, C. and Krashen, S. Is there a 'natural sequence' in adult second language learning? In E. M. Hatch (Ed.), Second Language Acquisition: A Book of Readings. Rowley, Mass.: Newbury House Publications, 1978.

Bates, E. and MacWhinney, B. Second language acquisition from a functionalist perspective: Pragmatic, semantic and perceptual strategies. In H. Winitz (Ed.), Native Language and Foreign Language Acquisition, Annals of the New York Academy of Sciences, Volume 379. New York: The New York Academy of Sciences, 1981.

Bever, T. G. The nature of the 'critical period' hypothesis. Paper presented at the Queens College Summer Conference on Language Learning, Queens College of the City University of New York, New York City, June 6, 1975 (a).

Bever, T. G. Psychologically real grammar emerges because of its role in language acquisition. In D.P. Dato (Ed.), Developmental Psycholingustics: Theory and Applications, Georgetown University Round Table on Languages and Linguistics 1975. Washington, D.C.: Georgetown University Press, 1975 (b).

Bever, T. G. Normal acquisition processes explain the critical period for language learning. In K. C. Diller (Ed.), Individual Differences and Universals in Language Learning Aptitude. Rowley, Mass.: newbury House Publishers, Inc., 1981.

Bialystok, E. A theoretical model of second language learning. Language Learning, 1978 (a), 28 (1), 69-83.

Bialystok, E. Language skills and the learner: The classroom perspective. In C. H. Blatchford and J. Schachter (Eds.), On TESOL '78: EFL Policies, Programs, Practices. Washington, D.C.: Teachers of English to Speakers of Other Languages, 1978 (b).

Bialystok, E. Explicit and implicit judgements of L2 grammaticality. Language Learning, 1979, 29 (1), 81-103.

Bloom, L. The importance of language for language development: Linguistic determinism in the 1980's. In H. Winitz (Ed.), Native Language and Foreign Language Acquisition, Annals of the New York Academy of Sciences, Volume 379. New York: the New York Academy of Sciences, 1981.

Bloom, L., Lifter, K. and Hafitz, J. Semantics of verbs and the development of verb inflection in child language. Language, 1980, 56 (2), 386-412.

Bowerman, M. Cross-linguistic similarities at two stages of syntactic development. In E.H. Lenneberg and E. Lenneberg (Eds.), Foundations of Language Development: A Multi-Disciplinary Approach, Volume 1. New York: Academic Press, 1975.

Bowerman, M. The child's expression of meaning: Expanding relationships among lexicon, syntax and morphology. In H. Winitz (Ed.), Native Language and Foreign Language Acquisition, Annals of the New York Academy of Sciences, Volume 379. New York: The New York Academy of Sciences, 1981.

Braine, M. D. On two types of models of the internalization of grammars. In D. Slobin (Ed.), The Ontogenesis of Grammar-A Theoretical Symposium. New York: Academic Press, 1971.

Bruck, M. Language impaired children's performance in an additive bilingual education program. Applied Psycholinguistics, 1982, 3 (1), 45-60.

Burstall, C. Primary French in the Balance. In J. B. Pride (Ed.), Sociolinguistic Aspects of Language Learning and Teaching. Oxford, England: Oxford University Press, 1979.

Caramazza, A. and Zurif, E. Comprehension of complex sentences in children and aphasics: A test of the regression hypothesis. In A. Caramazza and E. Zurif (Eds.), Language Acquisition and Language Breakdown: Parallels and Divergencies. Baltimore, Md.: the Johns Hopkins University Press, 1978.

Carroll, J.B. Twenty-five years of research on foreign language aptitude. In K. C. Diller (Ed.), Individual Differences and Universals in Language Learning Aptitude. Rowley, Mass.: Newbury House Publishers, Inc., 1981.

Carroll, J.B. and Sapon, S.M. Modern Language Aptitude Test: Manual. New York: The Psychological Corporation, 1959.

Chastain, K.D. A methodological study comparing the audiolingual habit theory and the cognitive-code learning theory. The Modern Language Journal, 1970, 54, 257-266.

Colombo, J. The critical period concept: Research, methodology, and theoretical issues. Psychological Bulletin, 1982, 91 (2), 260-275.

Corder, S.P. The significance of learners' errors. In J. Richards (Ed.), Error-Analysis-Perspectives on Second Language Acquisition. London, England: Longman, 1974.

Cummins, J. Cognitive/academic language proficiency, interdependence, the optimal age question and some other matters. Working Papers on Bilingualism, 19, 1979.

Cummins, J. The cross-lingual dimensions of language proficiency: Implications for bilingual education and the optimal age issue. TESOL Quarterly, 1980, 14 (2), 175-188.

De Villiers, J. and De Villiers, P. Language Acquisition. Cambridge, Mass.: Harvard University Press, 1978.

Diller, K. "Natural methods" of foreign language teaching. Can they exist? In H. Winitz (Ed.), Native Language and Foreign Language Acquisition, Annals of the New York Academy of Sciences, Volume 379. New York: The New York Academy of Sciences, 1981.

Dulay, H.C. and Burt, M.K. Errors and strategies in child second language acquisition. TESOL Quarterly, 1974 (a), 8 (2), 129-136.

Dulay, H.C. and Burt, M.K. "You can't learn without goofing:" An analysis of children's second language errors. In J. Richards (Ed.), Error-Analysis-Perspectives on Second Language Acquisition. London, England: Longman, 1974 (b).

Dulay, H.C. and Burt, M.K. A new approach to discovering universal strategies of child second language acquisition. In D.P. Dato (Ed.), Developmental Psycholinguistics: Theory and Applications, Georgetown University Round Table on Languages and Linguistics 1975. Washington, D.C.: Georgetown University Press, 1975.

Dulay, H. and Burt, M. Remarks on creativity in language acquisition. In M. Burt and H. Dulay (Eds.), Viewpoints on English as a Second Language. New York: Regents Publishing Company, Inc., 1977.

Dulay, H.C. and Burt, M.K. Natural sequences in child second language acquisition. In E.M. Hatch (Ed.), Second Language Acquisition: A Book of Readings. Rowley, Mass.: Newbury House Publishers, 1978 (a).

Dulay, H. and Burt, M. Some remarks on creativity in language acquisition. In W.C. Ritchie (Ed.), Second Language Acquisition Research: Issues and Implications. New York: Academic Press, 1978 (b).

Elbert, S. Spoken Hawaiian. Honolulu, Hawaii: The University Press of Hawaii, 1971.

Elbert, S. and Pukui, M.K. Hawaiian Grammar. Honolulu, Hawaii: The University Press of Hawaii, 1979.

Ervin-Tripp, S. Speech development: Its anatomical and physiological concomitants. In E.C. Carterette (Ed.), Speech, Language and Communication- Brain Function, Volume 3: UCLA Forum in Medical Sciences, Number 4. Los Angeles, California: University of California Press, 1966, (Discussant.)

Ervin-Tripp, S. Some strategies for the first two years. In T.E. Moore (Ed.), Cognitive Development and the Acquisition of Language. New York: Academic Press, 1973.

Ervin-Tripp, S. Is second language learning like the first? TESOL Quarterly, 1974, 8 (2), 111-128.

Ervin-Tripp, S. Social process in first- and second- language learning. In H. Winitz (Ed.), Native Language and Foreign Language Acquisition, Annals of the New York Academy of Sciences, Volume 379. New York: The New York Academy of Sciences, 1981.

Fathman, A. The relationship between age and second language learning productive ability. Language Learning, 1975, 25 (2), 245-254.

Fathman, A.K. ESL and EFL learning: Similar or dissimilar? In C.H. Blatchford and J. Schachter (Eds.), On TESOL '78: Policies, Programs, Practices. Washington, D.C.: Teachers of English to Speakers of Other Languages, 1978 (a).

Fathman, A. The value of morpheme order studies for second language learning. Paper presented at the Fifth International Congress of Applied Linguistics, Montreal, Canada, August 23, 1978 (b). (Discussion notes.)

Flavell, J. On cognitive development. Child Development, 1982, 53 (1), 1-10.

Gardner, R.C. Motivational variables in second language acquisition. In R.C. Gardner and W.E. Lambert (Eds.), Attitudes and Motivation in Second Language Learning. Rowley, Mass.: Newbury House Publishers, Inc., 1972.

Gardner, R.C. and Lambert, W.E. Language aptitude, intelligence, and second-language achievement. In R.C. Gardner and W.E. Lambert (Eds.), Attitudes and Motivation in Second Language Learning. Rowley, Mass.: Newbury House Publishers, Inc., 1972.

Genesee, F. The role of intelligence in second language learning. Language Learning, 1976, 26 (2), 267-280.

Genesee, F. Experimental neuropsychological research on second language processing. TESOL Quarterly, 1982, 16 (3), 315-322.

Genesee, F. and Hamayan, E. Individual differences in second language learning. Applied Psycholinguistics, 1980, 1 (1), 95-110.

Genesee, F., Lambert, W.E. and Tucker, G.R. An experiment in trilingual education: Report 4. Language Learning, 1978, 28 (2), 343-365.

Green, E. On children's comprehension of synonymous sentences. TESOL Quarterly, 1969, 3 (3), 189-196.

Green, E. Adult knowledge of English as a second language: Formal and practical. In J.E. Alatis (Ed.), Studies in Honor of Albert H. Marckwardt. Washington, D.C.: Teachers of English to Speakers of Other Languages, 1972.

Hakes, D. The Development of Metalinguistic Abilities in Children. Berlin, Germany: Springer-Verlag, 1980.

Hamayan, E.V. and Tucker, G.R. Language input in the bilingual classroom and its relationship to second language achievement. TESOL Quarterly, 1980, 14 (4), 453-468.

Heilenman, L.K. Do morphemes mature? The relationship between cognitive maturation and linguistic development in children and adults. Language Learning, 1981, 31 (1), 51-65.

Jacobson, M. Brain development in relation to language. In E.H. Lenneberg and E. Lenneberg (Eds.), Foundations of Language Development- A Multi-Disciplinary Approach, Volume 1, New York: Academic Press, 1975.

Jakobovits, L. Implications of recent psycholinguistic developments for the teaching of a second language. Language Learning, 1968, 18, 89-110.

Kernan, K. The Acquisition of Language by Samoan Children. Unpublished PhD. dissertation, University of California at Berkeley, 1969.

Kessler, C. The Acquisition of Syntax in Bilingual Children. Washington, D.C.: Georgetown University Press, 1971.

Kessler, C. Postsemantic processes in delayed child language related to first and second language learning. In D.P. Dato (ed.), Developmental Psycholinguistics: Theory and Applications, Georgetown University Round Table on Languages and Linguistics 1975. Washington, D.C.: Georgetown University Press, 1975.

Kiparsky, P. Linguistic universals and linguistic change. In E. Bach and R.T. Harms (Eds.), Universals in Linguistic Theory. New York: Holt, Rinehart and Winston, Inc., 1968.

Kluwin, T.N. The development of preposition usage in the written English of deal adolescents. Paper presented at the Third Annual Boston University Conference on Language Development, Boston, Mass., September 29-30, 1978.

Krashen, S. The critical period for language acquisition. Paper presented at a colloquium of the Speech and Hearing Sciences Department, the Graduate School and Center, the City University of New York, New York City, April 18, 1975. (Discussion notes.)

Krashen, S.D. Formal and informal linguistic environments in language acquisition and language learning. TESOL Quarterly, 1976, 10 (2), 157-168.

Krashen, S. The monitor model for adult second language performance. In M. Burt and H. Dulay (Eds.), Viewpoints on English as a Second Language. New York: Regents Publishing Company, Inc., 1977.

Krashen, S. Aptitude and attitude in relation to second language acquisition and learning. In K.C. Diller (Ed.), Individual Differences and Universals in Language Learning Aptitude. Rowley, Mass.: Newbury House Publishers, Inc., 1981.

Krashen, S.; Houck, M.; Giunchi, P.; Bode, S.; Birnbaum, R. and Strei, G. Difficulty order for grammatical morphemes for adult second language performers using free speech. TESOL Quarterly, 1977, 2 (3), 338-341.

Krashen, S.D., Long, M.A. and Scarcella, R. Age, rate, and eventual attainment in second language acquisition. TESOL Quarterly, 1979, 13 (4), 573-582.

Krashen, S. and Seliger, H. The essential contributions of formal instruction in adult second language learning. TESOL Quarterly, 1975, 9, 173-183.

Krashen, S.D.; Sferlazza, V.; Feldman, L., and Fathman, A. Adult performance on the SLOPE test: More evidence for a natural sequence in adult second language acquisition. Language Learning, 1976, 26 (1), 145-151.

Lambert, W.E. Bilingualism and language acquisition. In H. Winitz (Ed.), Native Language and Foreign Language Acquisition, Annals of the New York Academy of Sciences, Volume 379. New York: The New York Academy of Sciences, 1981.

Larsen-Freeman, D. The acquisition of grammatical morphemes by adult ESL students. TESOL Quarterly, 1975, 9 (4), 409-420.

Larsen-Freeman, D. An explanation of the morpheme accuracy order of learners of English as a second language. In E.M. Hatch (Ed.), Second Language Acquisition: A Book of Readings. Rowley, Mass.: Newbury House Publishers, 1978 (a).

Larsen-Freeman, D. Evidence of the need for a second language acquisition index of development. In W.C. Ritchie (Ed.), Second Language Acquisition Research- Issues and Implications. New York: Academic Press, 1978 (b).

Lecours, A. Myelogenetic correlates of the development of speech and language. In E.H. Lenneberg and E. Lenneberg (Eds.), Foundations of Language Development- A Multi-Disciplinary Approach, Volume 1. New York: Academic Press, 1975.

Lenneberg, E.H. Speech development: Its anatomical and physiological concomitants. In E.C. Carterette (Ed.), Speech, Language and Communication- Brain Function, Volume 3, UCLA Forum in Medical Sciences, Number 4. Los Angeles, California: University of California Press, 1966.

Lenneberg, E.H. Biological Foundations of Language. New York: Wiley and Sons, 1967.

Macnamara, J. Nurseries, streets and classroms; Some comparisons and deductions. The Modern Language Journal, 1973, 57, 250-254.

McLaughlin, B. Second language learning in children. Psychological Bulletin, 1977, 84 (3), 438-459.

McLaughlin, B. On the use of miniature artificial languages in second-language research. Applied Psycholinguistics, 1980, (a), 1 (4), 357-370.

McLaughlin, B. Theory and research in second language learning: An emerging paradigm. Language Learning, 1980 (b), 30 (2), 331-350.

McLaughlin, B. Differences and similarities between first and second language learning. In H. Winitz (Ed.), Native Language and Foreign Language Acquisition, Annals of the New York Academy of Sciences, Volume 379. New York: The New York Academy of Sciences, 1981.

Moeser, S.D. Semantics and miniature artificial languages. IN J. Macnamara (Ed.), Language Learning and Thought. New York: Academic Press, 1977.

Morris, B. Two types of learning strategies for adult aphasics and adult learners of English as a second language. Proceedings of the Fifth International Congress of Applied Linguistics. Montreal, Canada, August, 1978.

Morsbach, G. Cross-cultural comparison of second language learning: The development of comprehension of English structures by Japanese and German children. TESOL Quarterly, 1981, 15 (2), 183-188.

Naiman, N., Fröhlich, M. and Stern, H. The Good Language Learner. Toronto, Canada: Ontario Institute for Studies in Education, 1975.

Neufeld, G.G. Towards a theory of language learning ability. Language Learning, 1979, 29 (2), 227-241.

Oller, J.W. Attitude variables in second language learning. In M. Burt and H. Dulay (Eds.), Viewpoints on English as a Second Language. New York: Regents Publishing Company, Inc., 1977.

Oyama, S. A sensitive period for the acquisition of a non-native phonological system. Journal of Psycholingusitic Research, 1976, 5, 261-285.

Oyama, S. The sensitive period and comprehension of speech. Working Papers in Bilingualism, 1978, 16, 1-17.

Patkowski, M. The sensitive period for the acquisition of syntax in a secondary language. Unpublished PhD. dissertation, New York University, 1980.

Pukui, M.K., Elbert, S.H. and Mookini, E.T. The Pocket Hawaiian Dictionary. Honolulu, Hawaii: The University Press of Hawaii, 1980.

Quigley, S.P. and King. C.M. Syntactic performance of hearing impaired and normal hearing individuals. Applied Psycholinguistics, 1980, 1 (4), 329-356.

Ramirez, A.G. and Politzer, R.L. Comprehension and production in English as a second language by elementary school children and adolescents. In E.M. Hatch (Ed.), Second Language Acquisition: A Book of Readings. Rowley, Mass.: Newbury House Publishers, 1978.

Ritchie, W.C. Chomsky speaks at Syracuse. In T.L. Borodkin (Ed.), Applied Linguistics Newsletter: NYS-ESOL-BEA, June, 1982.

Roeper, T.; Lapointe, S.; Bing, J. and Tavakolian, S. A lexical approach to language acquisition. In S. Tavakolian (Ed.), Language Acquisition and Linguistic Theory. Cambridge, Mass.: The M.I.T. Press, 1981.

Rosansky, E. Methods and morphemes in second language acquisition research. Language Learning, 1976, 26 (2), 409-425.

Runyon, R.P. and Haber, A. Fundamentals of Behavioral Statistics. Reading, Mass.: Addison-Wesley Publishing Company, 1976.

Schachter, J., Tyson, A.F. and Diffley, F.J. Learner intuitions of grammaticality. Language Learning, 1976, 26 (1), 67-76.

Schlesinger, I.M. Miniature artificial languages as research tools. In J. Macnamara (Ed.), Language Learning and Thought. New York: Academic Press, 1977.

Scholes, R. Syntactic and lexical components of sentence comprehension. In A. Caramazza and E. Zurif (Eds.), Language Acquisition and Language Breakdown: Parallels and Divergencies. Baltimore, Md.: The Johns Hopkins University Press, 1978.

Schumann, J.H. The implications of interlanguage, pidginization and creolization for the study of adult language acquisition. TESOL Quarterly, 1974, 8 (2), 145-152.

Scovel, T. Questions concerning the application of neurolinguistic research to second language learning/ teaching. TESOL Quarterly, 1982, 16 (3), 323-332.

Seliger, H.W. Inductive method and deductive method in language teaching; A re-examination. International Review of Applied Linguistics, 1975, 13 (1), 1-18.

Seliger, H.W. Implications of a multiple critical periods hypothesis for second language learning. In W.C. Ritchie (Ed.), Second Language Acquisition Research: Issues and Implications. New York: Academic Press, 1978.

Seliger, H.W. On the nature and function of language rules in language teaching. TESOL Quarterly, 1979, 13 (3), 359-370.

Seliger, H. Strategy and tactic in second language acquisition. Paper presented at the UCLA Second Language Research Forum, Los Angeles, California, 1980.

Seliger, H. Exceptions to critical period predictions: A sinister plot. In R. Anderson (Ed.), New Dimensions in Second Language Acquisition Research. Rowley, Mass.: Newbury House, 1981.

Selinker, L. Interlanguage. In J. Richards (Ed.), Error Analysis-Perspectives on Second Language Acquisition. London, England: Longman, 1974.

Sinclair- de Zwart, H. Language acquisition and cognitive development. In T.E. Moore (Ed.), Cognitive Development and the Acquisition of Language. New York: Academic Press, 1973.

Slobin, D.I. Cognitive prerequisites for the development of grammar. In C.A. Ferguson and D.I. Slobin (Eds.), Studies of Child Language Development. New York: Holt, Rinehart and Winston, 1973.

Slobin, D.I. Language change in childhood and in history. In J. Macnamara (Ed.), Language Learning and Thought. New York: Academic Press, 1977.

Snow, C. Why are children better language learners than adults? Paper presented at the New York Academy of Sciences, New York City, March 10, 1980. (Discussion notes.)

Snow, C.E. English speakers' acquisition of Dutch syntax. In H. Winitz (Ed.), Native Language and Foreign Language Acquisition, Annals of the New York Academy of Sciences, Volume 379. New York: The New York Academy of Sciences, 1981.

Snow, C. and Hoefnagel-Höhle, M. Age differences in second language acquisition. In E.M. Hatch (Ed.), Second Language Acquisition- A Book of Readings. Rowley, Mass.: Newbury House Publishers, 1978.

Snow, C.E. and Hoefnagel-Höhle, M. Age differences in the pronunication of foreign sounds. Language and Speech, 1979 (a), 20 (4), 357-365.

Snow, C. and Hoefnagel-Höhle, M. Individual differences in second language ability: A factor analytic study. Language and Speech, 1979 (b), 22 (2), 151-162.

Taylor, B. Toward a theory of language acquisition. Language Learning, 1974, 24 (1), 23-35.

Taylor, B.P. Adult language learning strategies and their pedagogical implications. TESOL Quarterly, 1975, 9 (4), 391-400.

Tremaine, R. Piagetian equilibration processes in syntax learning. In D.P. Dato (Ed.), Developmental Psycholinguistics: Theory and Applications, Georgetown University Round Table on Languages and Linguistics 1975. Washington, D.C.: Georgetown University Press, 1975.

Tucker, G.R., Hamayan, E. and Genesee, F. Affective, cognitive and social factors in second language acquisition. Canadian Modern Language Review, 1976, 23, 214-226.

Walberg, H., Hase, K. and Pinzur-Rasher, S. English acquisition as a diminishing function of experience rather than age. TESOL Quarterly, 1978, 12 (4), 427-437.

Weber-Olsen, M. and Ruder, K.F. Acquisition and generalization of Japanese locatives by English-speakers. Applied Psycholinguistics, 1980, 1 (2), 183-198.

Wesche, M.B. Language aptitude measures in streaming, matching students with methods, and diagnosis of learning problems. In K.C. Diller (Ed.), Individual Differences and Universals in Language Learning Aptitude. Rowley, Mass.: Newbury House Publishers, Inc., 1981.

Wesche, M., Edwards, H. and Wells, W. Foreign language aptitude and intelligence. Applied Psycholinguistics, 1982, 3 (2), 127-140.

Whitaker, H. Neurolinguistic aspects of bilingualism. Paper presented at the Conference on Native Language and Foreign Language Acquisition, the New York Academy of Sciences, New York City, January 15-16, 1981. (Discussion notes.)

Wode, H. Language-acquisitional universals: A unified view of language acquisition. In H. Winitz (Ed.), Native Language and Foreign Language Acquisition, Annals of the New York Academy of Sciences, Volume 379. New York: The New York Academy of Sciences, 1981.

Zobl, H. Developmental and transfer errors; Their common bases and (possibly) differential effects on subsequent learning. TESOL Quarterly, 1980 (a), 14 (4), 469-482.

Zobl, H. The formal and developmental selectivity of L1 influence on L2 acquisition. Language Learning, 1980 (b), 30 (1), 43-57.

Zobl, H. A direction for contrastive analysis: The comparative study of developmental sequences. TESOL Quarterly, 1982, 16 (2), 169-184.